

The Intangibles

Values of Heritage Products for Design and Sustainability Initiatives

Suib, Siti Sarah Sirah Binti

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Design and Sustainability Initiatives



Sarah Suib

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Values of Heritage Products for
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Proefschrift

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door

Siti Sarah Sirah Binti SUIB
Ingenieur Industrieel Ontwerpen,
Technische Universiteit Delft, Nederland
geboren te Perak, Maleisië

This dissertation has been approved by the promotor.

Composition of the doctoral committee:

Rector Magnificus	chairperson
Prof. dr. ir. J.M.L. Van Engelen	Delft University of Technology, promotor
Em. Prof. dr. ir. J.C. Brezet	Delft University of Technology, promotor

Independent members:

Prof. dr. Hjh. R.S.B. Raja Kasim	University of Malaysia, Kelantan
Prof. dr. M.N.C. Aarts	Radboud University Nijmegen
Em. Prof. P.V. Kandachar	Delft University of Technology
Prof. ir. D.J. van Eijk	Delft University of Technology

Other member:

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THE INTANGIBLES

Values of Heritage Products for
Design and Sustainability Initiatives

Sarah Suib

Untuk Ayah
(For Ayah)

SUIB BIN ISMAIL
(1955-2013)

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Summary

*“An object is not an object, it is the witness to a relationship”
(Cecilia Vicuna)*

Values are attributed to products over time and across generations. They are created, compiled, shared, evolved, exchanged, and also discarded. However, creating an explicit theory and analysis on this subject is challenging due to the abstract and multifaceted nature of the topic with a plethora of theories from various research communities. To manage this complexity, the research focuses on the concept of values in association with heritage products: products that are inherited from the previous generation, in material and immaterial forms. The exploration entails identifying values of heritage products and their potential applications in design and sustainability initiatives and has been conducted based on the main research question below:

How can the values of heritage products be identified and applied as a creative resource for design and sustainability initiatives?

In the pursuit to find answers for this research question, Chapter 1 introduces the societal issues that leads to the initiation of this research: the paradox between the craft and design domains. The exploration focuses on both domains' knowledge in products and their development processes well as their objects of interest and aspiration, specifically, heritage products. The chapter also defines the concept of values in association with products and identifies two potential areas of applications for values of heritage products as a creative resource for design and sustainability initiatives. In Chapter 2, the thesis frames the main concepts of this research against the backdrop of the cultural economy which encompasses creative activities, productions, distributions, disseminations, and consumptions of goods and services embedded with cultural-oriented content (UNESCO, 2013, p. 24). Framing the research in this context presents the network of connections between the craft and design domains within the various scopes, diversity, and richness of the cultural economy, expands the research horizon by bringing the intangible cultural heritage into its discourse, and brings forward the craft industry as the empirical context. This context also provides the means to establish the initial research propositions that guide the development of the research approach in Chapter 3 and the theoretical exploration in Chapter 4.

The research approach and methods discussed in Chapter 3 involve the two-fold methodology of design research according to Blessing and Chakrabarty (2009, p. 5): ‘the development of understanding’ which supports the process of understanding

existing situations and ‘the development of support’ which indicate the importance of inducing change towards a desired situation. This methodology has been adapted as the foundation in developing the Research Approach which includes a General Descriptive Study and a Multiple-Case Study. Each case study is comprised of a Specific Descriptive Study and a Design Intervention. This approach serves as a perimeter in structuring the research activities during the empirical exploration.

Following the two key aspects of the main research question, the literature exploration in Chapter 4 is divided into two parts. Part 1 focuses on understanding and identifying the values of heritage products and Part 2 presents the adaptation of values as a creative resource in design and sustainability initiatives. By the end of the exploration, the research revisited the propositions and refined them according to the literature findings. The theoretical exploration demonstrated a hybridization of knowledge where knowledge from different fields of expertise were cross-fertilized to nurturing inter-language between them (Loulanski & Loulanski, 2016). Based on the findings from Chapter 3 and 4, the research established a setup for the design intervention sessions for the case study. In Chapter 5, the research presents the development of the tools and procedures used to guide the implementation of three design intervention sessions: a) Exploring Heritage Products, b) Building the Design Direction Framework, and c) Generating Conceptual Ideas.

Chapter 6 presents the results of the empirical exploration which is divided based on the outcomes of the General Descriptive Study and the case studies. These empirical outcomes are presented alongside the theoretical understanding underlining the relationships between the concepts presented in the research in the context of craft in Vietnam and Malaysia. The empirical findings suggest that representatives from the craft and design domains are invested in products and their development processes. There is a growing awareness of the importance of design within the craft domain as well as prevalent interests in adapting culture-oriented content as a source of inspiration among designers. These insights highlight the practical use of the design intervention sessions developed in this research, especially the session ‘Exploring Heritage Products’ which supported the initiation and implementation of the case studies. The case studies are discussed according to three implementation stages: preliminary, primary, and verification.

In Chapter 7, results from the case studies were analyzed based on the research propositions. The first analysis focuses on examining the exchange of knowledge between craft and design domains and transforming tacit knowledge associated with heritage products into explicit forms using the theory of boundary objects. This theory explores the roles of objects in stimulating and transforming the exchange of knowledge across domain (Nicolini, Mengis, & Swan, 2012). The second analysis is conducted to probe the composition of values inherent within heritage products. The research underlines that values attributed to heritage products can be understood,

described, and nearly decomposed based on a set of interrelated elements that comprise aesthetic, interaction, performance, construction, and meaning layers. The third analysis is performed to examine a structured approach that promotes an inclusive and conscious adaptation of values of heritage products (as culture-oriented content) in the product development process. The analysis focuses on discerning the link between heritage products and the concepts generated during the idea generation sessions. The fourth analysis is conducted with the notion that heritage products comprise interactions from the past which can be useful in modern day's sustainability initiatives. In the analysis, the values of heritage products are used as a resource to elicit sustainable elements associated to products. These analyses are performed with the aim to identify values of heritage product and to apply them as a resource in design and sustainability initiatives.

Finally, Chapter 8 presents the conclusion, the implications to theory and practice, the limitations of the research, and future works. The chapter highlights that although the research was initiated to address the gap and opportunity between craft and design domain; its main contribution is the explicit exploration of the concept of values in association with heritage products from theoretical as well as empirical perspective.

Chapter 1

Introducing the Research

This chapter introduces the societal issue that leads to the initiation of this research, the relevant concepts associated with the issue, the research objective, the formulation of research questions, and the outline of this thesis.

1 Introduction

The exchange of knowledge between craft and design domains remains nascent, especially in the early stage of the product development process. Insights from literature highlight that although stakeholders within the craft domain are often involved in the product development process, their participation is often limited to prototyping, production activities or as one of the research subjects in the early stages of the design process. This is rather unfortunate because similar to the design domain, the craft domain also possesses valuable knowledge, experiences, and aspirations when it comes to products and their development process.

Would it be possible to develop and nurture an inclusive and equitable means for craft stakeholders to be actively involved in the early stage of the design process? What is the knowledge and expertise that can be beneficial in the process? Are they interested and willing to be involved? Is there a possibility for craftspeople and designers to share their knowledge of products and their development process in effective, efficient and meaningful ways?

These questions highlight the needs as well as opportunities for the initiation of this research that focuses on exploring the exchange of knowledge between the craft and the design domains in the early stage of the design process. Such an exchange could potentially enrich both domains as it brings together the knowledge within the craft domain which is often associated with the past (Ravetz, Kettle, & Felcey, 2013; Sennet, 2009) and the knowledge in design which is oriented to the future whilst requiring designers to make sense of the past and the present (Krippendorff, 1989; Van Boeijen, 2015). The idea of safeguarding the past while designing for the future is perhaps the most intriguing aspect of projects involving both craftspeople and designers.

1.1 The paradox between craft and design domains

Craft and design domains comprise both cultural and creative activities (Pessoa, Deloumeaux, & Ellis, 2009) with commonalities that are too obvious to be ignored (Tsoumas, 2013). There are opportunities and advantages for both domains to work together and leverage each other's knowledge in forging new methods for future developments. However, craft and design domains are often perceived in a dichotomy in which craftspeople are known to be responsible in making and selling craft products as a source of income, while designers are considered to be involved in the process of designing and manufacturing of mass-produced items (Tung, 2012). In other words, designers are accountable for developing new products or services for the future whereas craftspeople are practitioners and makers who are responsible for reproducing designs of the past. Due to such dichotomy, it is not a surprise that local craft communities are often considered to be marginal, symbolical and at times rhetorical (Rees, 1997, p.130).

Rees (1997, p. 117) highlights that the market generally leads the development within the design domain whereas the makers are the leading factor in craft development. In this sense, external factors such as producers, users, and consumers played significant roles in influencing the product development in design, whereas internal factors—such as personal preference, self-expression or individual experiment (e.g. trying new techniques)—are dominant in craft development. The paradox between safeguarding the past while designing for the future is a vital motivation for exploring ways in which both domains are capable of exchanging their knowledge in a meaningful way. This section presents two main concepts that bring the craft and the design domain together: 1) knowledge about products and their developments, and 2) heritage products.

1.1.1 The Knowledge of Products and Their Developments

Both craft and design domains have valuable knowledge concerning products and their development processes; their perspectives and approaches, however, are fundamentally distinct (Tsoumas, 2013; Yair, Tomes, & Press, 1999). Both domains have a diversity of mental models, culture and heritage background which influence and dictate their communications, learning approaches, and preferred ways of working in a given situation. Hence, this research stipulates a definition of products and their development processes that are meaningful from the perspectives of both domains and will be used as a reference throughout this thesis.

In essence, every designed object represents ‘a set of assumptions and values about the way we live’ (H. Rees, 1997, p. 130) and either craft or design domains can be involved in its creation. Craftspeople’s knowledge is acquired through years of practice and experience (Dormer, 1997, p.147) thus their perspectives are often associated with tacit knowledge inherited and learned from the previous generations (Ravetz et al., 2013; Sennet, 2009). Tacit knowledge is embedded in the process of producing craft products (Sennet, 2009) and the embodiment of this knowledge is made tangible through their skills, techniques for crafting and making products. This process can be described as “all kinds of skilled, form-generating practices” (Ingold, 2000, p. 339). As for designers, their approach in product development is “about making sense of things” through innovation and at the same time does not forsake historical continuities (Krippendorff, 1989).

Design related tasks are considered as an area that deals with ‘wicked’ or ‘ill-structured’ problems (Buchanan, 1992; Coyne, 2005; Cross, 2007) which are subjected to change and evolve over time; hence, there is no definite solution to a wicked problem; instead the solution is often pragmatic in nature, and such solutions are more often than not—irreversible (Coyne, 2005). The process of experimenting in finding solutions for wicked problems is one of the reasons why the design process is heavily influenced and informed by both the present and the past (van Boeijen, 2015, p. 33-34). During this

process, every designer needs to synthesize various insights to develop solutions for such problems.

Common to both craft and design domains is that knowledge in their respective field exists predominantly in tacit forms. Tacit knowledge is typically personal—sometimes deeply so—and since it dwells within the human body and mind, it is often difficult to share and organize (Dormer, 1997, p.148). Tacit knowledge can be both personal and communal; embodied within individuals as well as communities and commonly transferred in tacit forms (Dormer, 1997, p. 148). As it is connected to an individual's knowledge and skills, the loss of that person also means the loss of the knowledge (Diehl, 2010, p. 15). This situation highlights a need as well as opportunity for this research to articulate part of the tacit knowledge shared between the craft and design domains into explicit forms. Following this insight, this research uses the different phases of the product development process as a reference to identify a suitable point for both domains to exchange their knowledge.

The Phases of the New Product Development Process

The new product development (NPD) process can be defined as a process to develop a new product or a service. Although there are various methods and models when it comes to the process of designing, Buijs (2003) highlighted that these models can be perceived as linear and logical as well as chaotic and abstract models. He further mentioned that these two perspectives are, essentially, two sides of the same coin. The linear and logical model by Roozenburg and Eekels (1995) illustrates the different phases of the design process is one of the better-known models in a larger product innovation process. Mink (2016, p. 13) highlights that these phases follow a strict development process which consists of product development and realization stages (Figure 1.1). Within this model, there are seven phases which include (1) policy formulation, (2) idea finding, (3) analyzing and defining the design problems, (4) idea, concept formation and selection, (5) defining product and determining value, (6) production, marketing and sales, and (7) product use.

Figure 1.1 also exhibits the approximation of these phases in comparison to a more straightforward representation of the design process by Stappers and Sanders (2008) which includes (a) fuzzy front end, (b) design criteria, (c) ideas, (d) concept, (e) prototype, and (f) product. This model emphasizes the early phase of a design process—the fuzzy front end. This phase is conducted to define design problems, develop the design requirements, and ensure informed design decisions (Mink, 2016, p. 13). It endorses inspirational thinking and creative activities although the process can be ambiguous and chaotic (Sanders & Stappers, 2008). During this stage, stakeholders involved are often required to evaluate their internal capacities and external opportunities (Jansen & Crul, 2012, p. 122) to develop the basis and understanding on what to design or not to design. Both models (as illustrated in Figure 1.1) are adopted in this research to develop a guideline to identify the different phases

and activities of products developments that are relevant to this research. To increase the clarity when discussing the different phases of the product development process in this thesis this research divides the product development process into four main phases: a) fuzzy front end, b) design process, c) crafting, and d) product use.

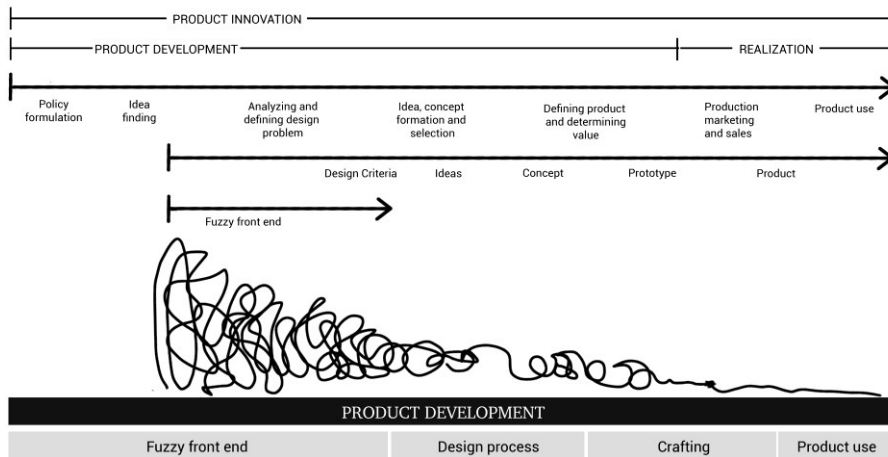


Figure 1.1: The product development process (based on Mink, 2016) and the phases adopted in this research.

Summary

The discussion in this section highlights that both craft and design domains have valuable knowledge when it comes to products and their developments processes. The term ‘products and their developments’ is an important concept in this research as it presents the boundary of knowledge shared between the craft domain and the design domain. To operationalize this term, this research defines products as designed objects that are capable of representing a set of values about the way we live (H. Rees, 1997, p. 130). Their developments, in this context, refer to the different phases involved in the development of the products. This research adopted two models of the product development process by Roozenburg and Eekels (1995) and Stappers and Sanders (2008) as a guide to identify the different activities conducted in the different phases of the product development process. The summary of this definition is illustrated in the definition box below.

DEFINITION BOX

Products & their developments

Products are designed objects that consist of a set of values capable of representing the way we live. Their development processes can be defined based on the different phases of the product development process, specifically, from the fuzzy front end to product use.

This research is interested mainly in the fuzzy front end phase as it offers a means to formally include the craft domain in the early stage of the design process. Moreover, as this phase includes a variety of explorations for creative ideas and solutions, there is a space as well as an opportunity for craft and design domains to explore each other's knowledge and expertise about products and their development processes in a manner that is effective, efficient, and meaningful. The following subsection presents the second concept of this research which is also a point of interest and aspiration for both domains: heritage products.

1.1.2 Objects of Interest and Aspiration

The previous subsection highlights that products and their development processes are a common area of interest between craft and design domains. To explore this commonality, this research focuses on objects that are important to craftspeople and also intriguing to designers—traditional craft products. For craftspeople, these products represent the roots of their knowledge, skills, and expertise that are inherited and learned from the previous generations (further elaborated in 4.2.1). As for designers, the practice of using traditional craft products as a source of inspiration is not new and has resulted in various contemporary ideas and products imbued with traditional elements (further elaborated in 4.5.2). Such a product represents a potential point of interest that can bring these two domains together.

Traditional crafts products are part of the contemporary products in the past. Their existence provides a glimpse of the everyday necessities of the previous societies and highlights the capability of local communities to build and cultivate their artificial environment (Ingold, 2000; Sennet, 2009). Blake (2000) uses the term “mundane cultural artifacts” to represent everyday objects that are closely connected to the society. Craft products as defined by Pessoa et al. (2009, p. 26) are products with “distinctive features which can be utilitarian, aesthetic, artistic, creative, culturally attached, decorative, functional, traditional, religiously and socially symbolic and significant.” Various terms have been used to represent similar products within the design domain, for example, ‘material artifacts’ (Moalosi, Popovic, & Hickling-Hudson, 2007), ‘cultural objects’ (Lin, 2007) and ‘ancient cultural artifacts’ (Luo & Dong, 2017). Next to this, the terms ‘object’, ‘product’ and ‘artifact’ have been used interchangeably in various contexts and studies. This research chooses to use the term ‘product’ as it reflects on daily objects with certain functions and utilitarian values. Furthermore, this term and its definition can be linked directly to theories established in the design field.

In brief, traditional craft products can be perceived as cultural artifacts that are close and significant to the local communities, have been made and re-made for generations, and are comprised of elements that embody the local culture and their heritage.

Heritage Products

Heritage relates to “what we value and wish to safeguard for future generations” (Giaccardi, 2011a; Prosalendis, Deacon, Dondolo, & Mrubata, 2004, p. 7). Heritage is a “value-loaded concept” (Hardy, 1988) and regardless of its manifestation (either material or immaterial) (Harvey, 2001) it is connected to human constructs particular to contexts, meanings, and experiences (Holtorf, 2004, p. 287). The concept of heritage has moved from a narrow perspective of “selected physical elements of ‘high culture’ to cultural artifacts which express society more generally, and even to non-material elements of culture”; nevertheless, one core aspect that remains the same is heritage is “an inheritance to be transmitted to future generations” (Blake, 2000). In a sense, heritage relates to material and immaterial elements that are inherited from the previous generations. It consists of elements that are important to be safeguarded for future generations.

The previous discussion highlights that traditional craft products are cultural artifacts that are significant to the local communities which have been made and re-made for generations and are part of the local cultural heritage. Based on these insights, this research adopted the term ‘heritage products’ instead of traditional craft products to expand the definition of such objects in this research. Apart from its traditional components, a heritage product, in essence, is still a product; therefore, this research assumes that theories established in the design field are applicable and can be used as the lens to understand various aspects associated with such products. The definition of heritage product is summarized in the definition box below.

DEFINITION BOX

Heritage products

Products that have been made and re-made for generations, consist of material and immaterial elements inherited from the previous generations, and embedded with values that are important to be safeguarded for future generations.

The ceramics made by the Royal Delftware or better known as ‘Delft Blue’ are examples of heritage products as these products have been part of the Dutch culture since the establishment of the company in the 17th century. This includes products that are physically passed on from one generation to another as well as those that are currently being produced by the company. For example, a tulip vase made by the company in the 18th century and the same vase design produced in the 21st century. These two types of products are considered heritage products as they are inherited and learned from the previous generations, have been made and re-made for generations, and embody certain values that are significant to the local context. In essence, both types of products have meaningful connections with individuals, families, local communities, or societies, if not a combination of those things. The meaningful

connections between people and objects highlight the third concept of this research: values, specifically those that are associated with products.

1.2 Values of Heritage Products

There are wide arrays of definitions when it comes to the concept of values, notably in anthropology, marketing and management, heritage, and also design studies. Interestingly, a lot of these studies mention that although there is a big body of research conducted on the concept of value there is no definite theory used as its foundation (this view is made by Tasci (2016), Graeber (2001, p. 22), Boztepe (2007), Babin, Darden, and Griffin (1994) with references to the research by Sewal (1901), Perry (1926), Mandler (1982), and Parasuraman, Zeithaml, and Berry (1988)). Sanchez-Fernandez & Iniesta Bonillo (2007) mention that this subject is one of the most ‘overused and misused concepts’ particularly in social sciences studies. The plethora of theories on this topic reflects its dynamic and complexity. To manage this intricacy, this research begins with the definition of value in association with products.

1.2.1 Value in Association with Products

In 1967, Hartman proposed that value in association to a product can be defined as both “meaning” and “richness of properties” (Hartman, 1967). In relation to products and services, the concept of value is linked to user satisfaction which is based on an evaluation between the users’ expectations and their experiences (Parasuraman, Zeithaml, & Berry, 1985). Satisfaction is personal, anchored to specific experiences, and closely related to the users’ interactions with a product or a service (Parasuraman et al., 1988; Sweeney & Soutar, 2001). Following this definition, the concept of value can be associated with our perceptions, interactions, experiences and evaluations (Babin et al., 1994; Boztepe, 2007; Parasuraman et al., 1988). This concept is also viewed as a capital that can be exchanged (or traded) when its worth can be evaluated and agreed upon (Boztepe, 2007; Graeber, 2001). Furthermore, it can be considered as a projection of “mutual creation”; “something [that is] collectively made and remade” (Graeber, 2013).

Cecilia Vicuna, a Chilean poet, artist, filmmaker and political activist wrote that “*an object is not an object, it is the witness to a relationship*” (Vicuña, 1997, p. 136). Sen no Rikyu (1522-1591), a historical figure in Japanese ‘way of tea’ asserted that objects allow us to explore our senses, mediate communication among people, and inspire new ideas (Hara, 2014, p. 55). Similarly, Krippendorf (1989) highlights that objects are part of our everyday necessities, we engage and communicate with them individually as well as collectively. Apart from its ‘operational’ and ‘social’ context, objects also comprise experiences that are embedded in or attributed to them which can be beneficial for the development of a new generation of objects (Krippendorff, 1989). In essence, these experiences are connected to values that are intricately

ingrained in objects, expand and contract with use and can be acquired and learned (Krippendorff, 1989).

These perspectives highlight that there is more than just physical manifestation when it comes to any object that exists among us. Apart from its physical manifestation, this research stipulates that a product also consists of values that are created, compiled, and evolved over time and across generations. Values in association with products are defined as satisfactory interactions created through evaluations based on what is expected and what is experienced (Parasuraman et al., 1985) Such an interaction can be shared, made and re-made (either individually or collectively) and traded when their worth are agreed upon. The definition box below presents the definition of values as adopted in this research in association to products and this topic is further elaborated in subsections 4.3.2: *Values and Human Interactions* and 4.3.3: *Values, Products, and Satisfactions*.

DEFINITION BOX

Values in association to products

Satisfactory interactions between users and products; based on an evaluation between user's expectations and his/her experiences in association with the product. Such interactions can be shared, repeated (either individually or collectively) and traded (when their worth are agreed upon).

The Likeness of the Concept of Values and Tacit Knowledge

There are similar components in relation to the concepts of values and tacit knowledge. Knowledge, in general, is defined as the information, understanding, and skills gained through education or experience (Oxford, n.d.). It can be categorized as either tacit or explicit knowledge. As discussed earlier, tacit knowledge is informal, deeply rooted in action (Nonaka, 1994), and dwells within the human body and mind (Dormer, 1997, p. 148). Explicit knowledge refers to knowledge that has been formulated and codified and therefore, can be transmitted formally and systematically (Nonaka, 1994).

Values, on the other hand, rely on expectations and perceptions of users (Parasuraman et al., 1985; Sanchez-Fernandez & Iniesta-Bonillo, 2007; Tasci, 2016) which means that the same knowledge might be perceived differently by one individual to the other. This notion relates closely to the definition of tacit knowledge. However, tacit knowledge is exclusively associated with a person while values can be attributed to objects or products. Essentially, the concept of value is bringing the context into play; this research is intrigued to explore this concept alongside the concept of tacit knowledge and proposes that sharing and exchanging tacit knowledge about a product that is meaningful to both craft and design domains can bring forward the values inherent within the product.

DEFINITION BOX**The concept of values**

Tacit knowledge based on an evaluation of what is expected and what is experienced; this evaluation can be attributed to people and/or objects.

The definition box above stipulates that the concept of values defined in this research. It is important to emphasize that the concept of value is highly theoretical and it requires broader empiric support to discern and recognize its complexity. Would it be possible for this research to capture values by exploring tacit knowledge? And what are the potential use and applications of such efforts in design and sustainability initiatives?

The following section discusses the potential applications of values of heritage products as a creative resource in the design context. By identifying and probing these areas of applications, this research aims to demonstrate the potential uses of values of heritage products and the benefits of the exchange of knowledge between the craft and design domains in the early phase of the design process.

1.2.2 A Creative Resource for Design and Sustainability Initiatives

Values inherent within heritage products offer tremendous resources for creative input in the design process. As these values are associated with compilations of knowledge and practices from the previous generations they can be unique and exotic, or mundane and ordinary, and at times, more sustainable in comparison to their modern counterparts.

There is limited research that specifically addresses the use of values especially of heritage products as a creative resource in the design process. However, the process of interpolating culture-oriented content into contemporary products is not something new among design professionals as well as its research communities (referring to works by Chuang & Chang (2012), Hagiwara & Price (2006), Lin (2007), Albus, Terstiege and Ulrich (2011), Tung (2012), Hara (2014), and Luo and Dong (2017)). Other research highlights that the lifestyle of our ancestors, although 'hard' and 'precarious' have shown to be more sustainable (Ehrenfeld & Hoffman, 2013, p. 85; Lou, 2008). Lou (2008) stated that "we, [the] Chinese have to admit in shame that our ancestors lived a far more sustainable lifestyle than we do today." Part of his assessment is influenced by a Chinese philosophy which considered human and nature as one. Similarly in the West, prior to the enlightenment period, nature is deemed to

be benevolent from the perspective of the society (Ehrenfeld & Hoffman, 2013, p. 105). Such a philosophy advocates that nature is a source to be revered instead of being conquered; an understanding that can contribute towards sustainable creations. The use of local resources, frugal practices to reuse, recycle, and repair was common in the past. For example, reusing threads from an old sweater to knit a new one¹ or collecting and patching used or unwanted fabrics to make blankets². There is a lot that can be learned from the previous generations, especially when it comes to living sustainably.

However, even though such knowledge is a well-known component within the fabric of our society, the understanding and recognition of its roles and influences in future developments are still an emerging research territory (Boccardi & Duvelle, 2013; Loulanski & Loulanski, 2016). What measures can and need to be taken by local stakeholders to promote the use of cultural content as a resource for future developments? What are the benefits of such actions?

This research took these questions and framed them as an opportunity to explore the use of values of heritage product in the context of contemporary design and its developments. In essence, there are numerous areas of applications in which values of heritage products can potentially be useful, for example in tourism, education, indigenous knowledge, inclusive museum, and heritage management. However, in selecting the areas of application to probe, this research takes into consideration the experience and expertise of the researcher in the product development process (both in theory and in practice) and existing body of knowledge within the Design for Sustainability (DfS) program where this research is conducted (“Design for Sustainability,” n.d.). The Design for Sustainability program is one of the research areas within the Design Engineering Department, Faculty of Industrial Design Engineering in Delft University of Technology. This research area is initiated in correspond to the global needs of sustainable developments exploring various areas in connection to design and sustainability, for instance, how to stimulate sustainable lifestyles and what can we learn from frugal innovations. Based on these considerations, the research identifies two areas of applications in relation to design and sustainability initiatives:

¹ An anecdote about a grandmother practice based on Prof. Jo Van Engelen’s personal experience.

² Another anecdote about a grandmother practice based on the researcher’s personal experience.

- The adaptation of values of heritage products in the product development process
- The use of values of heritage products to elicit elements of sustainability in designs of the past.

Heritage Products in the Product Development Process

Kenya Hara, MUJI's³ art director, mentioned in an interview with *Japan Times* that there is a shift from the process of creating products to a process of creating values. To achieve this, designers need to expand their perceptions beyond the typical means of resources—for instance materials and minerals—into more intangible resources such as aesthetics and culture (McKean, 2014). In another interview with *The Wall Street Journal* (2012), Hara advocates the use of heritage-oriented-resources as a means to inform designers during the design process;

“I wish people would better appreciate design culture and histories, and use them as a resource. For example at the time of the Meiji Restoration (1868-1912) the Japanese institutionalized traditions and aesthetics. It would be good to bring back those practices again when thinking about future home” (Kenya Hara, 2012)

The capability to capture and translate traditional values into new product ideas is one of the reasons that make Hara a respected designer locally as well as globally. His design principle creates products that exude the Japanese way of living, understand the needs of the present while being conscious of the values rooted in the past (McKean, 2014). Such a design principle demonstrates a process that captures and adapts traditional values into new product ideas.

There are various reasons behind the adaptation of culture-oriented content in new designs, for instance, to improve a product's identity, increase marketing values, enhance consumer experiences (Hsu, Lin, & Lin, 2011; Lin, 2007; Yair et al., 1999), create product differentiations (Lin, 2007; Moalosi et al., 2007; Tung, 2012), and also as a response to demands for unique and authentic products (McIntyre, 2010). However, such adaptation often happened unconsciously or in abstraction. The links

³ MUJI is a Japanese retail company founded in 1980 offering a variety of households and consumer goods with an economical and minimalist Japanese aesthetic. The name MUJI derived from '*Mujirushi Ryohin*' or 'no brand, quality goods' a philosophy in guiding their policy and product development.

between the old and the new often remain elusive and are even lost during the process of transformations and creations. Can this process be made conscious and explicit by involving stakeholders from the craft domain in the early stage of the design process? By answering this question, this research anticipates the possibility to discern the link between the old and the new.

In general, designers often need to take into consideration various inputs and perspectives to create certain value offerings. These inputs come in various forms of resources, for example, user insights, material characteristics, new technologies, market trends, and corporate brands among many others; they are considered as part of creative resources that inform designers and influence their design process (further elaboration in 4.2.2). This research defines creative resources in the product development process as a pool of resources that are used to inform designers and influence their design process as shown the definition box below. In this sense, values of heritage products vis-à-vis culture-oriented content can be considered as one of these creative resources (detail discussion in section 4.5). This notion presents an area of application for values of heritage products in which this research intends to deliberately include heritage products as one of the creative resources in the product development process.

DEFINITION BOX

Creative resources in the product development process

A pool of resources to inform designers and influence their design process.

Elements of Sustainability in Heritage Products

In the book, *'Eternally Yours: Visions on Product Endurance'*, van Hinte (1997, p. 19) discussed about products endurance and their psychological life span or the period in which they are considered as worthy objects. These objects are “used and cared for by those who see them, feel them, and dream about them (van Hinte, 1997, p. 19)”. Heritage products are examples of products that have stood and endured the test of time. This research perceived that products that have lasted for generations should be sustainable in some way. This leads to the second area of applications for values of heritage products—as a resource to identify elements of sustainability in designs of the past.

Sustainability is a complex and ever-changing concept (Faber, Jorna, & Van Engelen, 2005); hence, it is important for this research to establish a definition of sustainability that corresponds with the present as well as the previous generations. Such a definition would enable observation of the elements of sustainability in the past (for example, three hundred years ago) as well as in the present using the same method. Establishing this understanding is essential to seek and identify sustainable elements of the past that can be useful or applicable for future designs. As a starting point, this

research adopts the ‘three pillars of sustainability’: people, environment, and economy (Brundtland, 1987; Elkington, 1998; McKeown, 2006) also known as “the Triple Bottom Line’ (Elkington, 1998; P. Van Der Lugt, 2008, p. 7). This concept is widely used within the discourse of sustainability and also adopted by UNESCO in their sustainable development efforts (the next chapter discusses the link between this research and the sustainable development efforts underlined by UNESCO). Principally, these three pillars focus on economic prosperity, social cohesiveness, and ecological sustenance. This concept is often used as a means to understand the state of sustainability of the present generation as well as envision the state of sustainability of the future generations. It is rare that the discourse on these three pillars is centered on the knowledge and practices of the previous generations (subsection 4.6.1 elaborates on the present context of sustainability further).

“We live in a modern world. Our institutions are shaped by technology, technocracy, and scientific principles. We’re not instantly going away from them, but we do need to modify and, in some cases transform them. There is no reason that age-old ideas about what it means to be human cannot be brought back and reinjected into the modern world” (Ehrenfeld & Hoffman, 2013, p.105)

The excerpt above is from a book ‘*Flourishing: A Frank Conversation About Sustainability*’ which presents the discussion between John R. Ehrenfeld and his former student, Andrew J. Hoffman, on how to create a sustainable world. This excerpt echoes the interest in this research: to seek elements of sustainability of the past and to reflect on their potential, relevance, and usefulness in the contemporary society. As mentioned earlier, sustainable actions, for example recycling, repairing, and reusing are not foreign in the past. Moreover, traditional practices are often made of systems that do not infringe with the law of nature; in the best case scenario, they are made of systems that go hand in hand with nature.

Can the exchange of knowledge between craft and design domains on heritage products capture and reveal these hidden and forgotten practices? How useful are such values in the context of the new product development process? Does it make people appreciate their heritage and traditional practices? Does it make people reflect on the old traditions with sustainable benefits? If it does, can we adopt such practices into local initiatives? In response to these questions, this research aims to demonstrate the use of heritage products as one of the resources that can be used to seek elements of sustainability inherent within products of the past. The definition box below presents the definition of elements of sustainability associated with products. The development of this understanding is elaborated further in section 4.6 (*Elements of Sustainability of the Present and the Past*).

DEFINITION BOX**Elements of sustainability associated with products**

Elements of products that represent interactions between people (individually and collectively), the artificial environment, and/or the natural environment that allow these three tangible aspects of the world to flourish across generations.

1.3 Research Objective and the Research Questions (RQs)

Figure 1.2 presents the central concepts introduced in the previous two sections. This research addresses the gap and opportunity between craft and design domains in exchanging knowledge about products and their development processes. Corresponding to this opportunity, the concept of heritage products is introduced as a catalyst to bring both domains together and exchange their knowledge and expertise. Heritage products can be meaningful and significant to the craft domain and at the same time are interesting and inspiring to the design domain. What make these products relevant to this research is the values and meanings inherent within them that have been compiled over time and across generations.

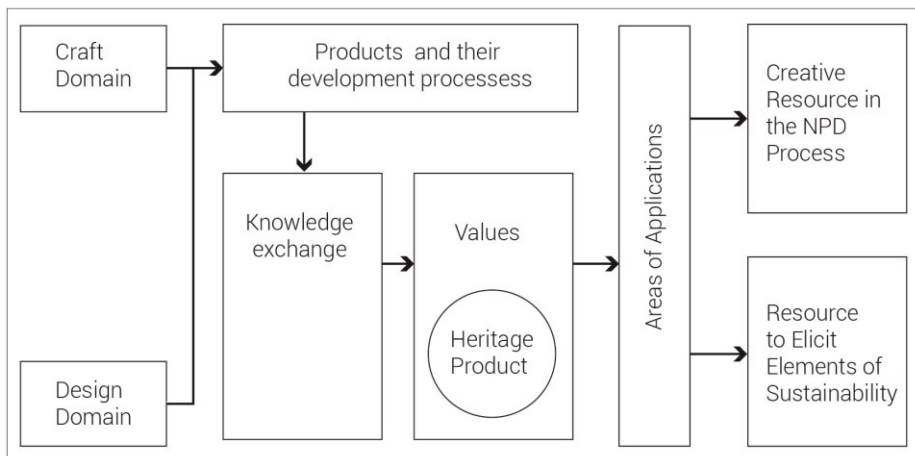


Figure 1.2: The overview of the main concepts introduced in this research.

Knowledge about heritage products and their development processes exist predominantly in tacit form. Tacit knowledge is personal as it dwells within the human body and mind, therefore it is hard to be shared and organized. To articulate such knowledge, this research aims to bring forward the values inherent within selected heritage products. Values in association with products are related to our evaluations, perceptions, interactions, and experiences. Furthermore, this research perceived that values of heritage products could be one of the creative resources adapted to the design and sustainability discourse. These findings lead to the formulation of the main research question (**MRQ**) for this research.

Main Research Question (MRQ):

How can the values of heritage products be identified and applied as a creative resource for design and sustainability initiatives?

The above **MRQ** encapsulates two key aspects of this research: a) to identify the values of heritage products and b) to apply these values as a resource in design and sustainability initiatives. In line with these key aspects, this research expands the **MRQ** into two parts. Part 1 focuses on understanding and articulating the values of heritage products shared between craft and design domains. Part 2 concentrates on the adaptations of these values as a resource in two selected areas of applications. The first area of applications focuses on the early phase of the product development process and the second area is connected to the elements of sustainability associated with products.

Two research questions have been formulated in Part 1. The first research questions (**RQ 1**) focuses on the exchange of knowledge between craftspeople and designers which also serve as a catalyst to articulate values of heritage products. Through this exchange, this research aims to explore a way to include stakeholders from the craft domain in the early phase of the product development process while articulating the values inherent within heritage products. The second research question (**RQ 2**) is concerned with understanding the values of heritage products from the theoretical and empirical perspectives.

Part 1: Identifying values of heritage products

Research Question 1 (RQ 1):

How can the exchange of knowledge between craftspeople and designers be adapted as a catalyst to articulate values of heritage products?

Research Question 2 (RQ 2):

What are the values inherent within a heritage product that are shared by craft and design domains?

In essence, Part 1 focuses on understanding and articulating values of heritage products. In this context, '*understanding values of heritage products*' (**RQ 2**) relates to the definition and operationalization of the concept of values in association to heritage products while '*articulating values of heritage product*' (**RQ 1**) refers to the process of making part of the tacit knowledge about these products explicit. These two focus points are, essentially, interlinked with one another and their relationship can be described as reciprocal interdependence. Reciprocal interdependence is part of Thompson's (1967) typology of interdependence situations; it expresses that the output of each become inputs for the other. With that said, this research chooses to

begin with the societal problem which concerns the need and presents the opportunity for the craft and design domains to exchange their knowledge about products and their developments—specifically those related to heritage products. Hence, the first research question focuses on the exchange of knowledge between the craft and design domains about heritage products followed by the second research question which concerns the composition of values inherent within heritage products.

Next, Part 2 focuses on the areas of application for values of heritage products. Two research questions have been formulated in relation to design and sustainability initiatives. The first area of application relates to the potential use of values of heritage products as a creative resource in the fuzzy front end of the product development process. This area of applications leads to the formulation of the third research question (**RQ 3**). The second area of applications relates the use of sustainability theories as a lens to explore values of heritage products and elicit elements of sustainability within the designs of the past. The fourth research question (**RQ 4**) has been formulated based on this area of application.

Part 2: Applying values of heritage products as a creative resource

Research Question 3 (RQ 3):

How can values of heritage products be used as a creative resource in the product development process?

Research Question 4 (RQ 4):

What are the values embedded in the heritage products that correspond with the elements of sustainability of a product?

Once the different concepts related to these **RQs** are understood, this research aims to establish the connection between knowledge within the craft and the design domain and contribute to the understanding of values in association to heritage products and their potential as a creative resource in the design process. This thesis is directed at (a) researchers who wish to expand their views on the concept of values in association to heritage products, and (b) practitioners within the craft and/or design domains who aim to explore the values of heritage products, (c) readers who are interested to use heritage products as a resource in their creative process.

This research also corresponds to four of seventeen United Nations' Sustainable Development Goals (SDGs) inaugurated on 25th September 2015. The two key aspects of this research a) identifying values of heritage products and b) applying these values as a creative resource relates to the fourth-goal '*Quality education*' which highlights the importance of "*appreciation of cultural diversity and culture's contribution to sustainable development.*" The eight-goal '*Decent work on economic growth*' indicates the need "*to promote sustainable tourism that creates jobs and promotes local cultural*

and products.” Although the tourism aspect is not the main scope of this research, its exploration is closely connected to the development of craft products with a specific focus on the local cultural heritage. The twelfth-goal *‘Ensuring sustainable consumption and production pattern’* includes the development and implementation of tools *“to monitor sustainable development impact for sustainable tourism that creates jobs and promotes local culture and product.”* In essence, the outcomes of this research can contribute towards a better understanding on the development and implementation of tools that influence aspects related to the development of local craft products, specifically, on the use of content from local cultural heritage a) as a creative resource in the product development process, and b) as a resource to elicit elements of sustainability in traditional products.

1.4 Thesis Outline

This thesis is composed of eight chapters (Figure 1.3). The structure of this thesis is slightly different from the conventional structure. In a conventional structure, the research approach comes after literature exploration. However, as the concepts identified in the early stage of this research can be broad and extensive (for example, the concept of value, design, and sustainability) Chapter 2 frames them against the backdrop of the cultural economy. By the end of this chapter, the research presents the initial conceptual model followed by a list of propositions to guide the theoretical and empirical narratives of this thesis.

Chapter 3 introduces a strategy to seek answers for the **RQs**. This chapter discusses the development of the research approach, relevant methods, and techniques, implementation plans, as well as the quality and vulnerability of the approach. In brief, the research approach is shaped by a two-fold methodology: the development of understanding and the development of support. The research approach adopts a multiple-case study method for its empirical exploration. Each case study is structured into two parts: a descriptive study and a design intervention.

In Chapter 4, the formal literature exploration and theoretical embedding for the propositions are presented. Following the division of the **MRQ**, this chapter is divided into two parts. Part 1 focuses on the opportunity of exchanging and articulating tacit knowledge between craft and design domains as well as understanding the structure behind the concept of values in association with heritage products. Part 2 explores two areas of applications in which the values of heritage products are adapted as a resource in design and sustainability initiatives. Following this chapter is a bridging chapter—Chapter 5—presenting the setup, tools, and procedures developed for the design intervention session during the empirical exploration.

Next, Chapter 6 describes the outcome of the empirical exploration. This chapter begins with an introduction of the context in the field work followed by the description

of six case studies conducted in this research. The results of the design intervention sessions are included in each case study. Chapter 7 presents the analysis and discovery based on the data collected from the design intervention sessions. The final chapter, Chapter 8 provides the conclusion and recommendations.

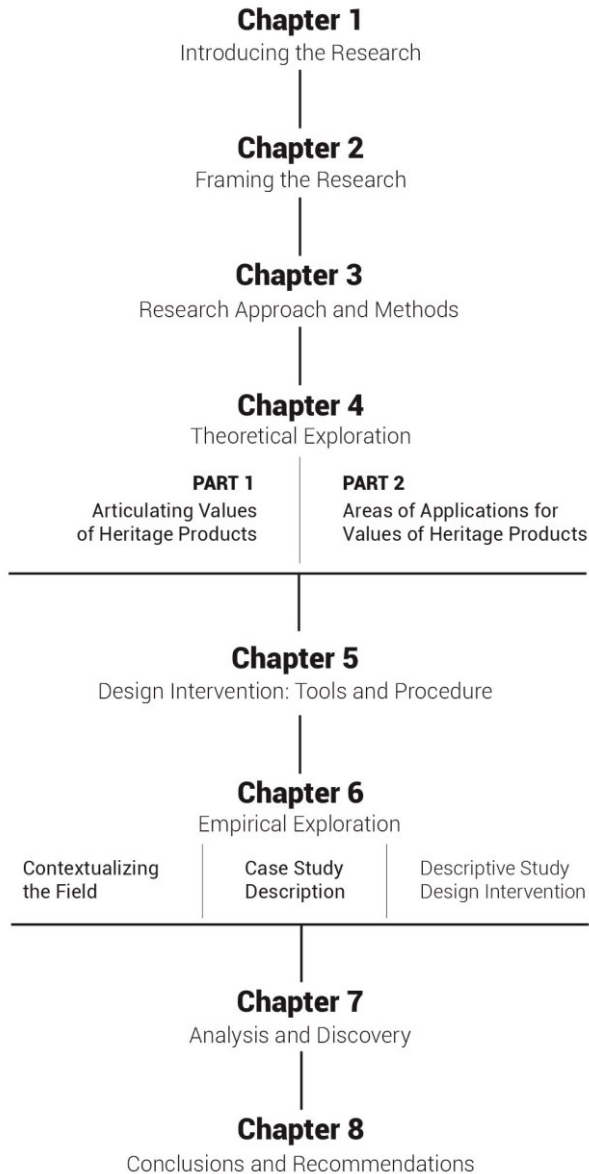


Figure 1.3: Outline of the thesis.

Chapter 2

Framing the Research

This chapter frames the main concepts of this research against the backdrop of the cultural economy, presents the conceptual research model, discusses the initial propositions to guide the theoretical explorations, and introduces the empirical domain.

2 Framing the Research and Its Opportunities

The previous chapter has introduced the problem, **RQs**, and key concepts of this research. In this chapter, these concepts are framed against the backdrop of the cultural economy; an economy where the craft and design domains are an integral part of its formation and cultural elements are embedded in its goods and services. This chapter begins with an introduction of cultural economy, specifically its cultural domains and their connection to heritage products. The discussion continues with the relevant factors in cultivating creative activities within these domains followed by the introduction of the empirical domain. Next, the conceptual research model is introduced illustrating the connections between the key concepts; it represents the basic composition for this research. The chapter continues with the initial propositions which have been formulated based on what this research expects to find or its educated guess to answer the **RQs**. Although propositions are supposed to be embedded in the theoretical exploration, this research chooses to introduce them earlier to provide an overview of the research and establish a foundation to understand the strategy to seek answers for the **RQs** in Chapter 3. The formal literature search and theoretical embedding to review and support these propositions are presented in detail in Chapter 4.

2.1 The Cultural Economy

The cultural economy comprises creative activities, productions, distributions, dissemination and consumptions of goods and services embedded with cultural content (UNESCO, 2013, p. 24). Such content can be influenced by the tangible and intangible cultural heritage as well as urban planning and architecture and can be produced individually or collectively, (Vickery, 2015). The term cultural economy is often used interchangeably or together with the term creative economy. The creative economy as discussed in UNESCO's Creative Economy Report 2013 touches aspects both from creative and cultural sectors (Vickery, 2015). There is no clear definition in differentiating these terms yet as this area of research is still evolving and progressing following the latest discourse on the topic (UNESCO, 2013, p. 21). However, since this research also includes theories established within the design domain—where the term 'creative' is widely used with diverse connotations and definitions behind it—the term 'cultural economy' is chosen to represent the diversity of 'culture and creative' activities as well as industries that use cultural content as part of the resources to drive their growth and development (definition box).

DEFINITION BOX

The cultural economy

An economy influenced by cultural-oriented content in the development, dissemination, and consumption of its goods and services.

2.1.1 The Cultural Domains

This research adopted the UNESCO’s Framework for Cultural Statistics (FCS) as a theory that bring the craft and design together. Initiated in 1986, FCS exhibits the different domains associated with culture-oriented resources. This framework illustrates the scope, diversity, and richness of the cultural economy and is considered as an essential structure in guiding and formulating policy (Vickery, 2015). It has been developed as a means “to measure cultural activities, goods and services by industrial and non-industrial processes” (Pessoa et al., 2009). The framework lists seven cultural domains that represent “culturally productive industries, activities, and practices” endorsed by UNESCO for a comparative data collection across countries (Pessoa et al., 2009, p. 23). Figure 2.1 shows an excerpt of the framework illustrating the seven cultural domains. This research uses this excerpt to illustrate the position of the craft and design domains within the cultural economy. Next to this, the framework also demonstrates another important domain—the intangible cultural heritage—a transversal domain that is linked to all the cultural domains.

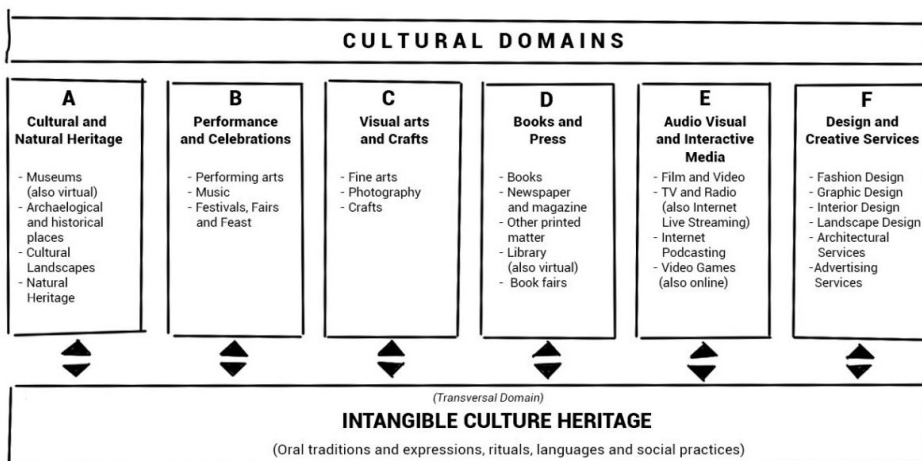


Figure 2.1: An excerpt of the Framework for Cultural Statistics by UNESCO (Pessoa et al., 2009).

The Craft and Design Domains

From Figure 2.1, it can be seen that the craft and design domains can be categorized as part of *Domain C: Visual Arts and Crafts* and *Domain F: Design and Creative Services* respectively. Domain C includes paintings, drawings, and sculpture which fall under the fine arts category; craft or artisanal products; photography; as well as commercial spaces where these objects are exhibited (Pessoa et al., 2009, p. 26). Domain F was introduced as part of the framework in 2009, and it covers “activities, goods, and services resulting from the creative, artistic, and aesthetic design of objects, buildings, and landscapes” (Pessoa et al., 2009, p. 28). Although the terms ‘industrial design’ or ‘product design’ are not explicitly listed in this domain; its definition does subsume the activities of designing and developing products.

Both domains are associated with products, specifically craft products. Domain C is linked to craft products with traditional features whereas Domain F is associated with craft products with contemporary elements (Pessoa et al., 2009, p. 26). The craft products within Domain C are described as part of traditional craft products (defined in 1.1.2). These products are considered as part of the traditional cultural expression (UNESCO, 2013, p. 98) and are closely connected to the people, their surroundings, social contexts, histories, and cultural heritage (Tung, 2012). They can be produced entirely by hand, with the assistance of hand-tools or mechanical means, however “direct manual contributions” of the craft person should be prominent in the finished products (Pessoa et al., 2009, p. 26). Craft products with modern features are categorized under Domain F (Pessoa et al., 2009, p. 26). Essentially, Domain F represents a creative domain where “culture becomes a creative input in the production of non-cultural goods” or a source for innovation (KEA European Affairs, 2006, p. 2). This highlights that even though the creative activities and processes may include culture-oriented content, the final products are not necessarily traditional or culturally-oriented. These are products considered to be ‘contemporary craft.’

This research defines the craft domain as a domain that is associated with the creation of traditional craft products; the design domain refers to a domain associated with the development of contemporary craft products (see the definition boxes). Further elaborations on these two concepts are given in subsections 4.2.1 and 4.2.2.

DEFINITION BOX

The craft domain

A domain associated with the creation of traditional craft products. Stakeholders within this domain are strongly connected to such products and their developments. These products have a significant influence on their lives (professionally and personally), are part of their cultural heritage, and intimately linked to the local communities.

DEFINITION BOX

The design domain

A domain associated with the process of designing contemporary craft products. Stakeholders within this domain are involved in the development of products for the mass market and often use cultural-oriented content as a creative resource in their process. However, such content is not necessarily connected to these stakeholders on a personal level.

The Intangible Cultural Heritage

As exhibited in Figure 2.1, the Framework for Cultural Statistics presents the *Intangible Cultural Heritage* as a transversal domain. A transversal domain refers to a domain that can stand on its own and at the same time apply to the other domains (Pessoa et al., 2009, p. 28). This characteristic highlights the capacity of the intangible cultural heritage to influence other cultural domains and demonstrates its importance

in driving, sustaining, and supporting the growth and development within the cultural economy. This domain represents the studies that explore ‘the functions and values of cultural expressions and practices’ and introduces new means of understanding, protecting and respecting our cultural heritage (Pessoa et al., 2009, p. 29).

The intangible cultural heritage refers to “the practices, representations, expressions, knowledge, skills – as well as instruments, objects, artifacts and cultural spaces” that have been “transmitted from generation to generation,” are “constantly recreated by communities and groups in response to their environment, their interaction with nature and their history,” and provide “a sense of identity and continuity” (UNESCO, 2003). It can only come into being when communities or groups recognize it as part of their heritage and not by external stakeholders such as governments, international organization, researchers, etc. (Pessoa et al., 2009, p. 28). In this sense, the process of identification and recognition of the intangible cultural heritage rest on the groups that maintain and transmit these elements. The definition box (shown below) presents the definition of the intangible cultural heritage from the perspective of this research. This concept is discussed further in subsection 4.3.1.

DEFINITION BOX

The intangible cultural heritage

Practices, representations, expressions, knowledge, skills, instruments, objects, artifacts, and spaces that provide a sense of identity and continuity to a group of people; that are transmitted from one generation to another and recreated by communities or groups in accordance to their existing context and situations.

Summary

This subsection introduced a framework which illustrates the different domains within the cultural economy. Through this framework, this research identified the position of craft and design domains and the importance and relevance of the intangible cultural heritage within the cultural economy. The discussion highlights two different types of craft products—traditional and contemporary craft products—that are connected to the craft and the design domains. Based on this discussion, this research defines four main concepts and their connections: the cultural economy, the craft domain, the design domain, and the intangible cultural heritage. These concepts expand and enrich the conceptual research model established in the previous chapter (see 1.3). In Chapter 4, this thesis delves further into these concepts and their association with products. The following section discusses the need to encourage creative activities within the cultural economy.

2.1.2 Cultivating Creative Activities within the Cultural Economy

*“There is an urgent need to find new development pathways that encourage creativity and innovation in the pursuit of inclusive, equitable and sustainable growth and development”
(UNESCO, 2013)*

This statement is from the Creative Economy Report by UNESCO, a report that discusses the use of culture for sustainable development. Culture is perceived as a driver as well as an enabler in broadening economic and social development pathways (UNESCO, 2013, p. 3). The report defines a development pathway as an inclusive approach that cultivates creativity, nurtures communities’ well-being, stimulates the economy, and empowers local stakeholders. It promotes efficient use of local cultural assets through the creative sector and vice versa. The report further underlines that fostering creative activities within the cultural economy induces economic and social development as well as promote knowledge production (UNESCO, 2013, p. 155). Such an approach can empower people to take charge of their development processes leading to a sustainable change and transformation that takes into account “diverse local values, conditions, resources, skills and limitations”(UNESCO, 2013).

Various factors need to be taken into consideration in cultivating creative activities within the cultural economy. This research synthesizes the critical factors in forging new development pathways for creative and cultural development as indicated in the Creative Economy Report (UNESCO, 2013, p. 155) into three categories shown in Table 2.1.

CATEGORIES	FACTOR
EXTERNAL & INTERNAL RESOURCES	<ul style="list-style-type: none"> • Local history, heritage and tradition • Responding to globalization • Critical and strategic thinking
COLLABORATIVE EFFORTS	<ul style="list-style-type: none"> • Cooperation among stakeholders • Collaborative efforts with the creative sector • Ethical and inclusive approach for economic and social development • Participatory decision-making
BUSINESS RELATED SUPPORTS	<ul style="list-style-type: none"> • Financial measures for the supply chain • Human resource capacity and proper infrastructure • Creative based business model for local enterprises

Table 2.1: Relevant factors in initiating new development pathways (UNESCO, 2013, p. 155).

The first category refers to the mobilization of external and internal resources. These resources include knowledge of local cultural heritage as well as critical and strategic

thinking that corresponds to the current progress of globalization. The second category is collaborative efforts among local stakeholders including those of the creative sectors. These efforts emphasize ethical and inclusive approach for economic and social development with participatory decision making. The third category is related to the support system in business which includes financial measures for supply chains, improvement in human resources capacity, development for proper infrastructures, and creative based business model for local enterprises. Such support systems can serve as an incentive to boost the economy.

This research probes further into two of the categories in cultivating creative activities within the cultural economy: (a) the mobilization of internal and external resources and (b) the collaborative efforts among local stakeholders. These two categories have been selected because their factors are directly connected to this research; identifying and applying culture resources in a creative setting, and promoting collaborative efforts between local craft and design stakeholders. The third category—business-related support, however, is not adopted due to its broader scope of interest. Furthermore, adapting this category would require more time and resources for this research.

Inclusive Approach between Craft and Design Domains

Knowledge exchange is indispensable in stimulating local development (Tung, 2012). In developing countries, craft production activities play a significant role in the cultural economy (UNESCO, 2013, p. 20) whereas the design and creative activities are more often linked to developed countries (UNESCO, 2013, p. 30). For instance, a collection of IKEA bamboo-based products may be developed by designers in Älmhult, Sweden but its production processes are likely to be performed in developing countries such as Vietnam or China. This division between labor-intensive works and design related activities is a common strategy in various other industries as well, for example, fashion, electrical appliances, and furniture. In essence, this strategy is reliant on the abundant and cheap human resources within the developing countries and more often than not produces ‘a unequal division of labor’ (UNESCO, 2013, p. 30). This situation raises the question about the possibility of bringing these two divisions closer to each other.

In this research, this possibility is addressed by bringing the knowledge of local craftspeople in the early stage of the product development process. This inclusive approach aims to promote and cultivate an efficient use of local cultural assets within creative activities. Such an approach mobilizes resources from both the craft and the design domains and instigates collaborative efforts among local stakeholders. The exchange of knowledge between craft and design domains through collaboration can be an insightful, fruitful platform where both domains can effectively and efficiently work together.

2.1.3 This Research in Context of the Cultural Economy

By framing the main concepts against the backdrop of the cultural economy, this research identifies the position and network of connections of the craft and design domains within the various scope, diversity, and richness of the cultural economy. The adaptation of cultural economy also expands the research horizon by bringing the intangible cultural heritage into its discourse. This expansion adds stimulating references in building the concept of values inherent within heritage products from the perspectives of cultural heritage studies.

The exploration of the cultural economy also highlights the need to cultivate creative activities within the cultural domains. The call for such efforts presents the opportunity for this research to nurture creative activities and provide equitable means for local stakeholders to make efficient use of their cultural resources. Responding to this opportunity, this research aims to develop an inclusive approach by taking into consideration; (a) the use of cultural resources in creative settings and (b) the collaborative efforts among local stakeholders. Heritage products serve as a creative resource and at the same time, the catalyst for craft and design domains to collaborate—in the early stage of the product development process. The development of this approach is presented in *Chapter 5: Design Intervention: Tools and Procedure*. Next to this, framing the cultural economy as the backdrop brings forward the craft industry as the empirical context for this research.

Corresponding to this discussion, this research delves into an empirical area within the cultural economy where both domains participate actively in its development, and where heritage products can be identified easily; the craft industry of Vietnam and Malaysia.

2.2 The Empirical Domain

The empirical domain presents the real world context that is relevant to this research. In essence, the selection of this domain correspond to the key concepts relevant to this research which focuses on the craft industry within the emerging economies, involves in producing both traditional and contemporary craft products with strong or visible connections to the local cultural heritage. The first empirical domain, Vietnam's craft industry fits to these criteria. Furthermore, this selection was also practical as this Ph.D. research is a continuation of the researcher's MSc graduation project conducted under the Sustainable Product Innovation Project (SPIN) in Vietnam. The research also selected a second empirical domain in order to establish generalizability of the research and its findings in another emerging country. Malaysia's craft industry fits to these criteria. This selection is also opportunistic in nature as this Ph.D. research is funded by the Ministry of Higher Education (MOHE) of Malaysia. In addition, the researcher working experiences, established networks of connections, and existing

infrastructures related to the research topic in both countries also contributed to the selection of these empirical domains.



Figure 2.2: Vietnam and Malaysia in the South East Asia (SEA) region.

Vietnam and Malaysia are two countries within South East Asia (SEA) region with comparatively different economic, social and cultural settings including the nature of their craft industries. The influence of local cultural heritage is strong within the craft industry in both countries. However, in Vietnam local producers tend to be involved in business-to-business (B2B) type of commerce while the Malaysian producers deal mostly in business-to-consumer (B2C) type of commerce (further elaboration in 6.1). These two countries have similar land areas: 331,689 km² for Vietnam and 329,847 km² for Malaysia (United Nations, 2007). However, based on the estimation for 2017, Malaysia is much less populous, with only 31.6 million people in comparison with 95.5 million people in Vietnam (United Nations, 2017). The difference in population contributes to their human resources capacity which can indirectly influence the commercialization of craft products. The next section introduces the conceptual research model that represents the connections between the main concepts and the initial propositions of this research.

2.3 The Conceptual Research Model and Initial Propositions

This section presents an expanded conceptual research model (Figure 2.3) which includes two main concepts discussed in this chapter: the cultural economy and the intangible cultural heritage. Based on this expansion, this research formulates four initial propositions. These propositions demonstrate a projection of answers to the **RQs**. As mentioned in Chapter 1, section 1.3, the **RQs** are formulated based on two main parts of the **MRQ**. Part 1 focuses on understanding and articulating the values of heritage products shared between craft and design domains. Part 2 concentrates on the adaptations of these values as a resource in two selected areas of applications. The formal literature search and theoretical embedding to review these propositions are presented in detail in Chapter 4.

As shown in the figure, the cultural economy (defined in 2.1) established a connection between the intangible cultural heritage, the craft domain, and the design domain. The connection between these four concepts also presents the empirical context for this research—the craft industry. As part of the cultural economy, culture-oriented content is embedded in the productions, distributions, and consumptions of goods and services within this industry. This means that the intangible cultural heritage is one of the resources that fuel its growth and development. The intangible cultural heritage (see 2.1.1) can be perceived as the tangible and intangible elements that are continuously being passed on from one generation to another; contributing to the richness of culture, its diversity, as well as local identities. These elements permeate directly and indirectly through products and services; especially among those considered to be part of the cultural economy.

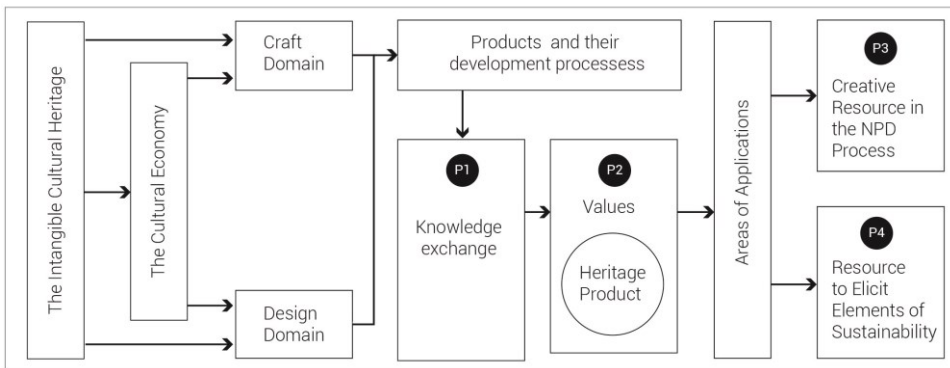


Figure 2.3: The Conceptual Research Model.

Using the Framework of Cultural Statistics as a reference, this research identified craft and design domains as two domains involved within the cultural economy. On the one hand, craft as a domain is known to be ‘highly social and open to shared working’ (Ravetz et al., 2013, p. 3). Therefore, it is not only related to the industry, but also the communities that are involved in sustaining the practices, knowledge, and skills

inherited from the previous generations. On the other hand, design as a domain has established its scientific understanding based “on a reflective practice of designing” (Cross, 2007). As discussed in Chapter 1, this research is interested in these two domains due to their existing knowledge and capacity in products and their development (see 1.1.1). The design domain comprises contemporary knowledge on designing products whereas the craft domain is adept at sustaining the traditional way of product-making. This connection should not be disregarded as it demonstrates an opportunity for both domains to collaborate and exchange their knowledge in the pursuit of inclusive, equitable and sustainable growth and development (Tsoumas, 2013).

However, fostering the exchange of knowledge across domains can be a challenge. Tension tends to arise when different styles of knowledge work together (Kilbourn, 2015, p. 68). Carlile (2002) discusses a few aspects which may contribute to this situation: 1) the tacit nature of knowledge, 2) its stickiness, and 3) the specialization of knowledge in practice which means knowledge is often localized, embedded and invested in a specific domain. This suggests that although the craft and design domain may have similar knowledge interest, sharing and exchanging such knowledge would inevitably be a challenge. To overcome this challenge, this research identifies heritage products as a tangible point of interest shared between craft and design domains.

The heritage product is a concept introduced in subsection 1.1.2 to represent products that are inherited or learned from the previous generations. These objects are embedded with values that have been made and re-made for generations. Subsection 1.2.1 highlights that values in association with products are connected to human perceptions, interactions, experiences, and evaluations. By exploring the knowledge exchange between craft and design domain, this research aims to articulate the values inherent to heritage products. In line with this aim, this research examines the possibility of articulating the tacit knowledge associated with heritage products into explicit forms while taking into consideration inclusive and equal contributions from the craft and design stakeholders. Based on the connections between these concepts, this research presents two propositions in connection with **RQ 1** and **2** which focus on identifying values of heritage products (see 1.3):

Part 1: Identifying Values of Heritage Products

Research Question 1 (RQ 1)

How can the exchange of knowledge between craftspeople and designers can be adapted as a catalyst to articulate values of heritage products?

Proposition 1 (P1)

The craft domain and the design domain interests in products and their development processes offer an opportunity for both domains to exchange their knowledge about heritage products and a chance to transform the tacit knowledge associated with these products into a meaningful resource.

Research Question 2 (RQ 2)

What are the values inherent within a heritage product that are shared between craft and design domains?

Proposition 2 (P2)

Values are attributed to products; this research proposes that these values are a set of interrelated elements that is shared over time and across generations; and between craft and design domains.

Table 2.2: RQ 1 and 2 and the propositions.

Transforming the tacit knowledge associated with heritage products into explicit forms increases the possibility of such knowledge being used as a resource in design and sustainability initiatives (Figure 2.3). This research has identified two relevant areas of application for values of heritage products (discussed in 1.2.2) which represent the content for Part 2, focusing on applying values of heritage products as a creative resource.

The first area of application is related to the use of values of heritage products as one of the creative resources in the product development process. In this application, heritage products are deliberately included in the early stage of the product development process. This research proposes that an inclusive and conscious adaptation of culture-oriented content in new designs can be achieved by including such content systematically during the design process. This application leads to the formulation of **P3** (Table 2.3).

The second area of application focuses on the use of values of heritage products as a resource to elicit interactions from the previous generations that promotes a sustainable way of living. Subsection 1.2.2 has highlighted that theories related to sustainability within the design field are often oriented toward the future. However, this research proposes that these theories can be adapted as a lens to observe the elements of sustainability of the past as well; hence, it is vital for this research to build a robust understanding on the concept sustainability that corresponds with the past, the present and the future. By exploring this area of application, this research aims to identify sustainable interactions practiced by the previous generations and reflect upon their usefulness, relevance, and potential in the contemporary society. Strengthening sustainable practices that are rooted locally offer a sense of awareness and appreciation to its people. Moreover, enhancing and reinforcing existing practices is often easier than adopting a new practice. This context leads to the formulation of **P4** (Table 2.3).

Part 2: Applying Values of Heritage Products as a Creative Resource**Research Question 3 (RQ 3)**

How can values of heritage products be used

Proposition 3 (P3)

Applying the values of heritage products as a

as a creative resource in the product development process?

creative resource in the early stage of the new product development process promotes an inclusive and conscious adaptation of cultural related content in new design ideas.

Research Question 4 (RQ 4)

What are the values embedded in the heritage products that correspond to the elements of sustainability of a product?

Proposition 4 (P4)

Heritage products comprise of interactions from the past which can be useful in modern day sustainable initiatives, this research proposes that contemporary standards on sustainability—especially those established in the design field—can be used as indicators to identify and elicit these interactions.

Table 2.3: RQ 3 and 4 and their propositions.

Through these propositions, this research presents the need as well as the opportunity of exploring and articulating values of heritage products as a meaningful resource for both craft and the design domains. The next chapter discusses relevant research methods and the development of the research approach to identify values of heritage products and explore its potential applications as a creative resource in design and sustainability initiatives.

Chapter 3

Research Approach and Methods

This chapter presents a research approach developed based on a combination of research methods as a strategy to seek answers for the research questions. It also discusses the quality as well as the vulnerability of this research approach.

3 A strategy to Seek Answers for the RQs

The previous chapter frames the research against the backdrop of the cultural economy, presents the conceptual research model, and lists four initial propositions in relation to the **RQs**. Continuing with this research trail, this chapter describes the development of a research approach to seek answer for the **RQs** using the propositions as a reference. This chapter begins with a summary on the research objective followed by the development of the research approach. Then, it describes the relevant research techniques and discusses the quality and vulnerability of the approach. This chapter is concluded with a revised version of the conceptual research model in line with the establishment of the research approach.

As discussed in Chapter 1, there are two key aspects in this research: a) the articulation of values of heritage products, and b) their areas of application in design and sustainability initiatives. These two research aspects are exploratory in nature as both probe into a new research area where design theories are used as the lens to explore knowledge related to heritage products and their potential applications in design-oriented settings. The intention of this exploration is to generate a better understanding on the intangible cultural heritage from the perspective of design, especially its roles and influence on products and their developments processes.

Approach for an Exploratory Research

Exploratory research can be considered as a study that investigates a new emerging research area with a minimal amount of information or data available from the previous research (Brown, 2006, p.43). Babbie (2004, p.88) highlights three different aspects related to the decision to conduct an exploratory research: (a) to examine a particular research area, (b) to evaluate the value of a method or a research area, and (c) to build new knowledge. This research presents a new research area that bridges the gap between the craft domain, the design domain and heritage studies against the backdrop of the cultural economy. Within this research setting, design theories are used as a lens to explore heritage products within the context of the local craft industry. The insights captured through this exploration can be a stepping stone towards a more elaborate and concrete research that can bring design, craft and heritage studies closer.

However, there is no complete scheme from literature to fully answer the research questions; thus this research developed a research approach from a selection of relevant research methods. The research focuses on qualitative research methods that are common in design research and offer the means to collect data from the field or the 'real-world context'. Based on a combination of these methods, a research approach which serves as a strategy to guide its implementation, especially in the empirical exploration is developed.

3.1 The Development of the Research Approach

The conceptual model and the initial propositions established in the previous chapter highlight that the research focuses on the setup to articulate values of heritage products and explore their potential areas of applications. In order to create a condition that allows relevant data to be collected, a research approach that focuses on understanding the local context, identify needs and opportunities in the field and develop a support system to improve the situation is developed. To achieve this, two main research strands proposed by Blessing and Chakrabarti (2009) in the Design Research Methodology (DRM) are adopted. Blessing and Chakrabarti (2009, p. 5) define design research as a research that integrates the development of understanding and the development of support with an overall aim "to make design more effective and efficient, in order to enable design practice to develop more successful products." The first research strand focuses on *'the development of understanding'* which supports the process of understanding existing situations. The second research strand focuses on *'the development of support'* which highlights the need to initiate certain actions and induce change towards a desired situation.

This two-fold methodology can be considered as a design-oriented approach in conducting research, capturing main aspects of the design practice, understanding the context, identifying the needs, and developing solutions (Pahl & Beitz, 1995). As highlighted by Blessing and Chakrabarti "developing support and improving a design (or situation)" is the essence of design research (2009, p. 33). This methodology is suitable for the construction of the research approach as it offers a means to: 1) understanding the local people, their context and situations, and 2) creating a support system to influence the current situation. However, these two research strands only provide the basic foundation for the research approach. The following subsection presents relevant methods adopted in order to operationalize this methodology in this research.

3.1.1 Relevant Research Methods

In order to implement the two-fold methodology in the context of this research, this subsection discusses four relevant research methods. These methods were adopted as some of their principles and techniques are deemed applicable in the development of the research approach. The discussion begins with the first method—the four stages of DRM which represent the procedure of implementation for the methodology. Next, the research discusses the second and third method together—action research and design intervention, followed by the fourth method—multiple-case study. Finally, the research summarizes different factors that lead to the adaptation of these methods in the research approach.

Design Research Methodology (DRM)

DRM's methodological framework consists of four stages and these stages consist of methods tailored to conduct a design research. These stages represent the operationalization of the two research strands in DRM. Table 3.1 shows the four stages of DRM. The first stage, Research Clarification, refers to the process of conducting literature exploration to define research goals and objectives. The second stage, Descriptive Study-1, refers to the process of exploring an existing situation based on the outcomes of Research Clarification to understand the current context. The third stage, Prescriptive Study, refers to the process of generating a support system with the aim to induce change towards the desired situation. Finally, the fourth stage, Descriptive Study 2, refers to the process of evaluating the impact of a support system, specifically in its ability to achieve the desired situation.

Blessing and Chakrabarti (2009, p. 17) mentioned that these stages are not rigid and linear in nature; but are discursive variations to suit the objective and constraints of a particular project is possible and at times, necessary. They also added that rigid applications of design methodologies often yield negative effects based on the observations by Fricke (1993), underlining that a flexible and goal-oriented approach produces better designs in comparison to rigid design methodology steps. This means that these stages are not a set of procedural steps that need to be strictly followed; instead, different iterations and parallel implementations are possible in each stage as well as between stages (Blessing & Chakrabarti, 2009, p. 42). This approach relates on the discursive nature of a design process where iterations are endorsed and the process is organized in “a deliberate step-by-step approach that can be communicated and influenced” (Leenders, Van Engelen, & Kratzer, 2007).

Stages	Activities and Outcomes
1. Research Clarification (RC)	Conducting a literature exploration to define goals.
2. Descriptive Study – 1 (DS-1)	Exploring an existing situation to understand the current context.
3. Prescriptive Study (PS)	Generating a support system to induce change towards a desired situation.
4. Descriptive Study – 2 (DS-2)	Evaluating the impact of the support and its ability to realize the desired situation.

Table 3.1: Four stages of Design Research Methodology (Blessing & Chakrabarty, 2009).

This research recognizes that there are certain similarities between these stages and the typical research approach. For example, part of the activities identified in the Research Clarification stage are identifying the focus of the research, highlighting the

main research problems, establishing the research questions, and determining contributions of the research (Blessing & Chakrabarti, 2009) are common in the beginning of a research work. Next to this, the Descriptive Study-2 stage can be perceived to be equivalent of an evaluation phase which is also a typical approach in a research. However, this research also identifies that the essence of DRM or a design research is the Descriptive Study which is comparable to “*the development of understanding*” and the Prescriptive Study which is similar to “*the development of support*”. These insights are captured based on the general understanding of the methodology and this research realized that it is also a complex endeavor to implement the different stages of DRM in operation.

To reduce this complexity, this research chooses to focus on the Descriptive and Prescriptive study as both represent the essence of a design research. A descriptive study is conducted to understand the existing phenomenon and generate the foundation for the next stage—the prescriptive study (Blessing & Chakrabarti, 2009, p. 33). It often uses passive research methods, for example, “observation, participant observation, document analysis, questionnaire, and interview (Blessing & Chakrabarti, 2009, p. 84)”. The Prescriptive Study focuses on inducing change by creating a support system to achieve a desired situation. A prescriptive study relates to a description of the desired phenomenon and the development of a support system that would induce change based on the described phenomenon. Blessing & Chakrabarty (2009, p. 10) mention two relevant methods in relation to a prescriptive study: a) action research and b) design intervention. These methods can be used to explore the development of support once the existing phenomenon has been understood.

This research assimilates the activities within the Research Clarification stage as part of the typical approach at the beginning of this research. Specific activities within the Research Clarification stage are integrated into different parts of the research. For example, the understanding and the initial depiction of an existing situation (known as Initial Reference in DRM) and the desired situation (known as Impact Models) are adopted as part of the procedure in the early stage of the Descriptive and Prescriptive Study. As for the Descriptive Study-2, this research adopts the multiple-case study approach as part of its efforts to maintain the quality of the research. By adopting this approach, this research focuses on conducting several set of Descriptive and Prescriptive Studies as part of its evaluation efforts instead of focusing on a cycle of a study. Nevertheless, this research includes the evaluation criteria in the Descriptive Study-2 which concern ‘*usability and applicability*’ and ‘*usefulness*’. These criteria are adopted as part of the evaluation of the method developed in this research.

Action Research and Design Intervention

In the previous discussion, this research identifies that action research and design intervention are two relevant methods for a prescriptive study as they can be used to explore the development of support. Action research as defined by Reason and

Badbury (2001, p.1) is “a participatory and a democratic process.” It “seeks to bring together action and reflection, theory and practice in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities.” Brydon-Miller, Greenwood, and Maguire (2003) adopt this definition in the launch of the journal ‘Action Research’. In her Ph.D. thesis, Skelton (2017, p. 31) discussed the different aspects related to this method. It involves identifying real world context, includes practice base problems, and incorporates the ‘messiness’ in relation to complexities, dynamics and limitations of everyday practice; subsequently apply iterative actions to improve the status quo because of their change oriented approach; and devise collaborative relations between researchers, practitioners and participants. Van der Lugt (2008) considered action research as a research strategy as well as an intervention method. He uses de Hartog & van Sluijs’s definition of action research: “a research strategy centered on the implementation of an intervention in order to solve and understand a problem in which the researcher actively participates.” From a design perspective, design intervention can be considered as the “practice of collective creativity” with approaches such as participatory design, collaborative design, co-design and meta-design (Carolan & Cruickshank, 2010).

These definitions highlight the similarities of action research and design intervention in the development of support or a prescriptive study. This research perceived that the development of support includes the participation of individuals or a group of people in an intervention in which the researcher actively participates to achieve the desired situation. As the term, ‘design intervention’ fits this description and in general, connects to a prescriptive study; this term will be used onwards to represent the development of support in this research.

Multiple-case Study Approach

Case study research is a distinctive form of empirical research methods that allow observations of social phenomena in a real-world context (Yin, 2014, p. 20); it is descriptive in nature (Babbie, 2004, p. 293) and derives from “the desire to understand complex social phenomena” (Yin, 2014, p. 16). Thus, ‘a case’ can be described as consisting of certain conditions relevant to an area of focus. According to Yin (2014, p. 16), the holistic perspective between a phenomenon and its context highlights the difference between this method to an experiment as the latter “deliberately separates a phenomenon from its context.” This approach is chosen as it provides the means to observe the combination of descriptive and prescriptive study as a case.

Similar to DRM, in its early stage, this approach also requires a certain theory development as a reference point to develop the procedure for data collection as well as a guideline to select cases (Yin, 2014, p. 59). This step is described as the ‘theory development’ by (Yin, 2014) which is also included in the description of ‘extended case

method' by Burroway (1991) as discussed by Babbie (2004, p. 293). According to Babbie, the extended case method requires the researcher to generate certain expectations based on theories before going into the field. The objective of this method is not to approve or reject certain theories but instead to improve or rebuild existing theories based on the empirical data. This insight is similar to Yin's (2014) perspective on the outcomes of a case study approach: they are generalizable to theoretical propositions but not of a population in the world (Yin, 2014, p. 21).

A case study is an approach that can be constructed as a single or multiple-case design. Although a single case design has its advantages, its findings can be vulnerable as the outcomes can be unique and specific to the case. This is one of the reasons why conducting two or more cases with similar conditions can offer more compelling and robust results with substantial analytical benefits (Yin, 2014, p. 64). On the other hand, multiple-case designs require extensive resources and can be time-consuming (Yin, 2014, p. 63); these factors need to be taken into consideration in dealing with the process, arrangement, and outcomes of this research.

There are two possible options in the replication process: (a) closed design, and (b) adaptive design. A closed design refers to a replication process in which the cases are a literal duplication of the original case study while an adaptive design refers to minor or major adjustments or alterations of the original case study based on new information discovered during data collection (Yin, 2014, p. 65). This replication approach is similar to the iterations process described in DRM and common in creative processes. This means that the procedure and conditions are not necessarily strict towards the original setup but can be modified or altered based on findings from prior cases. From the perspective of this research, the adaptive design offers certain flexibility; enabling the research to adapt to changes in the field and offering a space of improvement based on the experience in the field.

Summary

The two-fold methodology and the different research methods provide the foundation for the development of the research approach. This research adopts the two stages of DRM: descriptive study and prescriptive study as the core structure of the research approach. These two stages represent the essence of design research: 1) understanding the current situation and 2) developing a support system that can induce change towards the desired situation. The similarities between prescriptive study, action research, and design intervention have been discussed and the research chooses the term 'design intervention' to represent the development of support. In this context, design intervention includes the participation of individuals or a group of people in an intervention in which the researcher actively participates to achieve the desired situation. This research also adopts the case study method, specifically multiple-case study with an adaptive design as part of its research approach. Firstly, the techniques and approaches in the case study method support the development of understanding,

offering the means to understand a complex social phenomenon. Secondly, as a case study is built based on a specific area of research with certain conditions and expectations from the theories, it allows this research to incorporate a descriptive study and a design intervention into a case. Thirdly, through the multiple-case study method, this research can conduct several case studies based on similar conditions. These repetitions offer more robust results with substantial analytical benefits in comparison to a single case study. Finally, an adaptive design in a multiple-case study method provides the means for an iteration process and offers flexibility for the research to adapt to new changes and unexpected conditions in the field. Based on these inputs, this research developed its research approach. The following section presents the detail descriptions of the research approach structure and its implementation techniques.

3.2 The Research Approach

As a design research, this research is exploratory in nature. It adopts qualitative research methods for the empirical exploration. In the previous section, this research has discussed the relevant methodology and identified a number of methods to be adopted in the development of the research approach. Figure 3.1 illustrates its the basic structure.

The empirical exploration begins with a General Descriptive Study conducted as a means for the researcher to engage with a specific social context for an in-depth understanding of the local context and to build the foundation for the initiations of the case study method. As discussed in the previous section, this research adopted a multiple-case method. Hence, a number of case studies are conducted based on certain conditions and procedures (the condition and procedure for a case study are presented in Chapter 5). In general, these procedures and conditions are developed with an adaptive design to ensure flexibility in mitigating various factors in the field. In this sense, the case studies are conducted in iterations in which the procedures and conditions can be modified or improved according to the insights from the previous case studies.

Figure 3.1 also illustrates that each case study consists of a Specific Descriptive Study and a Design Intervention. Firstly, it is important to note that the Design Intervention is the primary method used to collect data for the analysis of this research. However, conducting the General and Specific Descriptive Study are necessary before implementing the Design Intervention. The General Descriptive Study is conducted to grasp a broad perspective or an overview of the local context while the Specific Descriptive Study is conducted to understand the situations that are limited to the stakeholders involved in a case study.

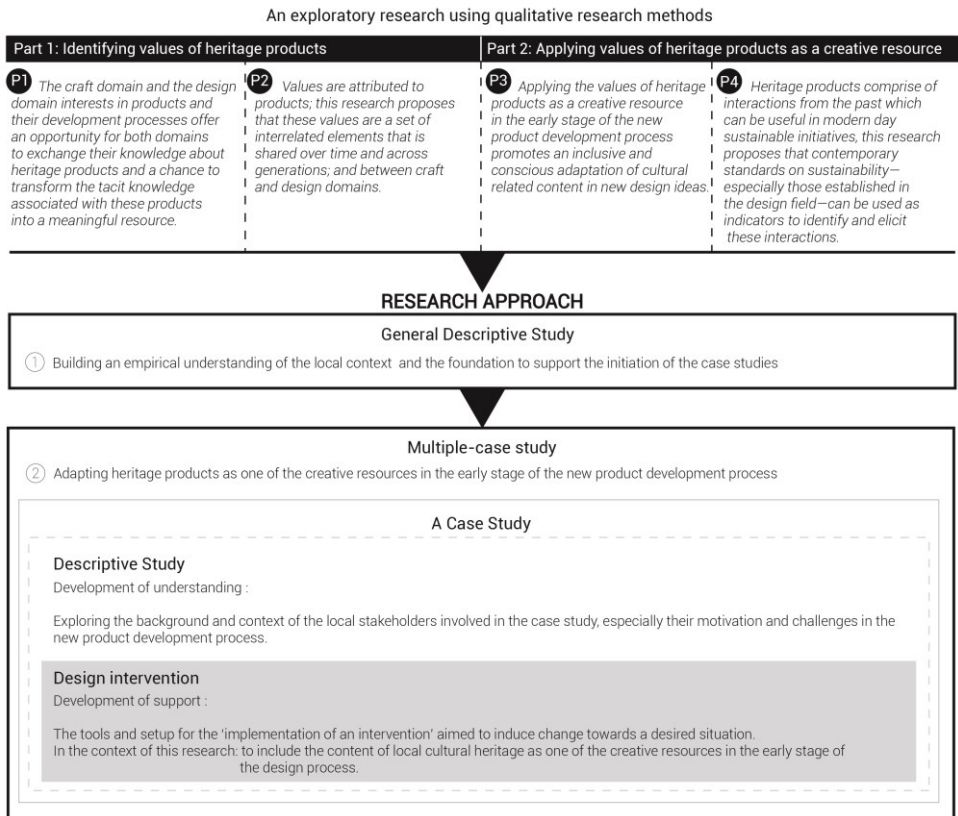


Figure 3.1: The basic structure of the Research Approach.

The combination of Specific Descriptive Study and Design Intervention is an essential component in the replication process for every case study. It allows multiple-case studies to be conducted. Following this setting, every case study is considered as a unit and will be replicated based on these two-points of explorations:

- *The first exploration* focuses on understanding the current context and situation of the local stakeholders within the craft industry (in Vietnam and Malaysia) and developing the foundation to support the initiation of a case study.
- *The second exploration* focuses on adapting heritage products as one of the creative resources in the early stage of the product development process.

In brief, the General Descriptive Study and the Multiple-Case Study represent the basic composition of this research approach and also act as the perimeter in structuring the research activities during the empirical exploration. Each method comprises specific research techniques and procedures to guide the implementation in the field. The next two subsections present the objectives and the research activities related to the general descriptive study and each case study.

3.2.1 The General Descriptive Studies

A descriptive study is related to the development of understanding in which research activities are conducted to explore an existing situation and understand its current context (Blessing & Chakrabarti, 2009). Here, this study is conducted with the aim to understand the situation of the local craft industry in Vietnam and Malaysia. It establishes an understanding about local stakeholders, their current situations, problems as well as challenges, especially in efforts and activities relating to the products and their development processes. Through this study, this research also explores the link between the local craft industry and its cultural heritage, specifically, the influence of the cultural heritage in local craft products and the community.

Figure 3.2 illustrates the different points of exploration in this study. Four main aspects of exploration are craftspeople, designers, the product development process and the local cultural heritage.

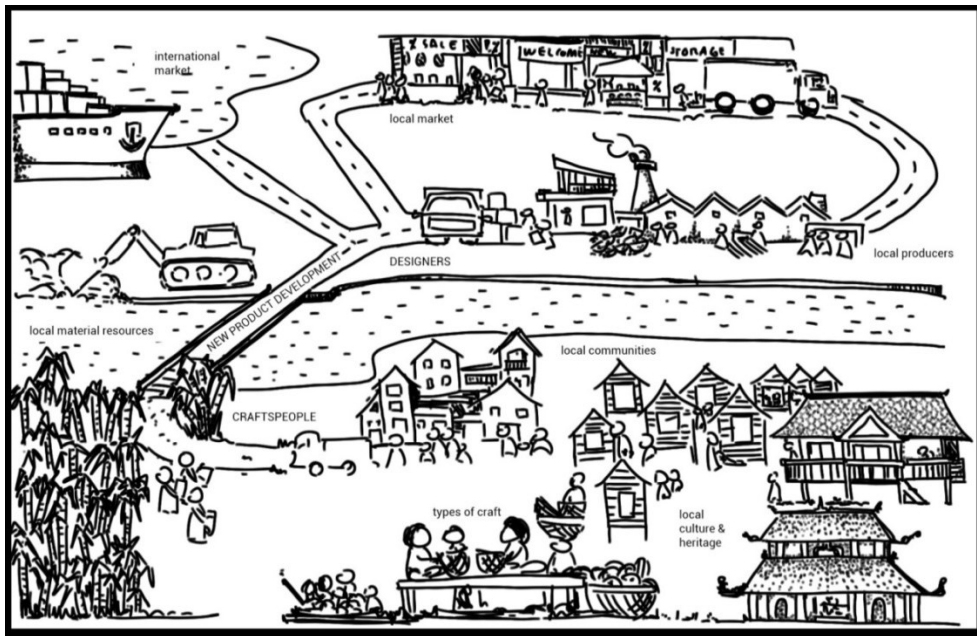


Figure 3.2: The different aspects related to the 'General Descriptive Study.'

Apart from building an overview of the current situation within the local craft community and the industry, this study is also conducted as a foundation to initiate the case studies. Data collected in this study can be divided into two categories:

- *Real-time data collection:* reflect on data that was directly experienced by the researcher thus may be comprised of rich descriptions of events. Examples of methods are observation, taking field notes, visual, audio or video recordings, site visits, documentation on the occurrence, and content of certain events.

- *Retrospective data collection*: reflect on data collected from existing sources. For instance, from someone's memory, documented events or other relevant content. Examples of this data collection are documents about the context, existing reports, semi-structured interview, and questionnaire.

These different techniques and research activities are adapted to build an understanding of the current situation. In brief, General Descriptive Study is conducted with the aim to understand the local craft industry, its efforts concerning the product development process, and the influence of the cultural heritage within the industry and the local communities. This study also serves as a platform to scout and invite relevant and interested stakeholders to collaborate and participate in a case study.

3.2.2 The Case Study

The case study in this research is conducted with the aim to integrate the use of heritage products as one of the creative resources in the early stage of the product development process. In line with this objective, this research invited local craft stakeholders to participate in a design workshop that focuses on developing new product ideas whilst using the cultural heritage as one of the points of reference for the process.

The Specific Descriptive Study

In general, the methods of data collection in the Specific Descriptive Study are similar to the general descriptive study. However, this descriptive study focuses specifically on the participants involved in a case study. The study aims to understand the stakeholders, their background, current conditions, their connections to the local cultural heritage, vision, and mission, as well as approaches, challenges, and aspirations in the product development process.

Figure 3.3 presents four main research activities that are specific to this study:

- Field visits to the company, their production sites as well as other relevant stakeholders within their supply chain.
- A semi-structured interview with the main stakeholders involved in the design intervention session.
- Physical artifacts collected from the field.
- Descriptions of factors that lead to the organization of the design intervention.

These activities provide the basis for the development of support and help the researcher to structure a design workshop that fits the stakeholders' needs and requirements and at the same time generates data for the research.

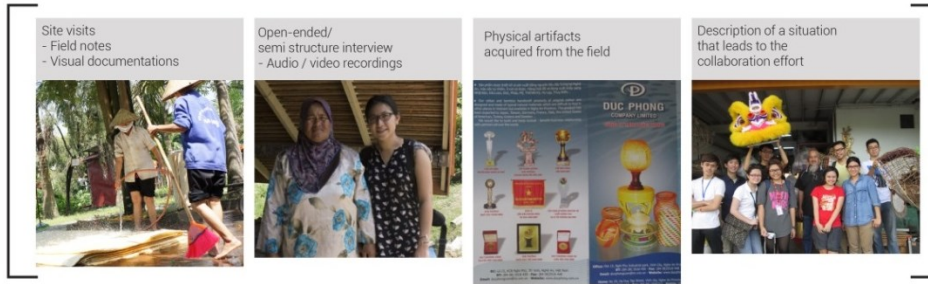


Figure 3.3: Research activities in Specific Descriptive Study (SDS).

The Design Intervention

The development of support in this research is designed based on the ‘implementation of an intervention’; an approach that refers to creative facilitation methods where collaborative sessions are conducted to generate ideas and solutions (Tassoul, 2009, p. 16). In addition, the intervention session also adopted the ‘bricolage’ approach; that focuses on making efficient use of current resources and capabilities among stakeholders during the development process (Jin, 2015, p. 175); it is also known as ‘a baby step’ approach in the product development process (Berchicci, 2005, p. 37). The principles and techniques from these two approaches provide the foundation in developing the design intervention sessions in each case study.

Within this setting, a number of design intervention sessions (or creative facilitation sessions) are structured as part of a design workshop to support the process of developing new product ideas in collaboration with local stakeholders. Two main observations that influence its development are: 1) to simulate activities related to the product development process, and 2) to incorporate heritage products as one of the creative resources in the process. The first factor relates to the needs of local stakeholders to learn and experience the different aspects of the product development process. The second factor is connected to the requirement of this research: to explore the values of heritage products (**P1** and **P2**) and their potential applications in a design setting (**P3** and **P4**). Figure 3.4 presents the selection of the design intervention sessions that have been structured as part of the design workshop. The sessions comprise design activities in the fuzzy front end to the design process (see Figure 1.1).

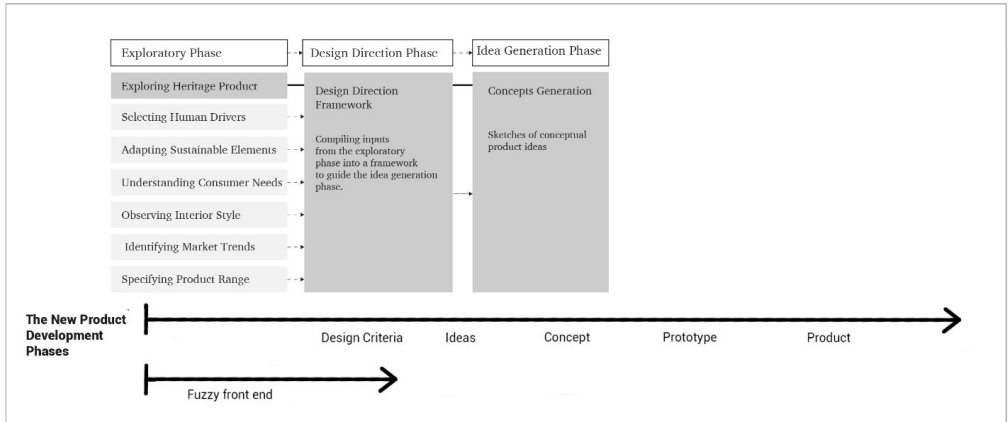


Figure 3.4: The structure for the design workshop.

Figure 3.5 presents the types of data collected during the design intervention sessions: (a) recordings of the sessions, (b) heritage products, (c) the outcomes of exploring heritage products, (d) sketches of product concepts, (e) short questionnaire about each session, and (f) observation notes from the researcher. In reference to the propositions, this research only focuses on data collected in three design intervention sessions (in dark grey boxes); *Exploring Heritage Products* (**P1**, **P2**, **P3**, and **P4**), *Design Direction Framework* (**P3**), and *Concept Generations* (**P3**). The other design intervention sessions (in light grey boxes) are essential to stimulate activities related to the product development process; however, the content and activities within these sessions are not directly connected to the propositions. Details about the setup, tools, and procedures of these sessions are discussed further in *Chapter 5: Design Intervention: Setup, Tools, and Procedure*.

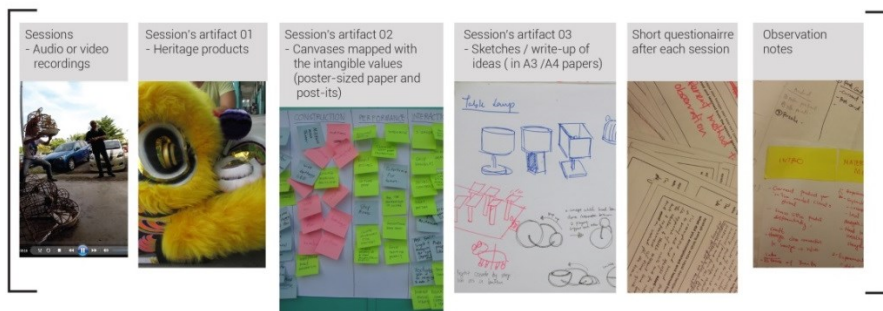


Figure 3.5: Examples of data collected during the design intervention.

3.3 Research Quality and Vulnerability

This section discusses the efforts as well as challenges in maintaining the quality and managing the vulnerability of the research. Yin (2014, p. 46) highlights the importance of using several tactics to maintain the quality of research and continuous efforts throughout the different research stages. He highlights that the quality of any empirical social research can be observed through four common tests: construct validity, internal validity, external validity, and reliability. The aspects related to these tests include ‘trustworthiness, credibility, confirmability, and data dependability (Yin, 2014, p. 45).’ These aspects are similar to the Lincoln and Guba (1985) evaluative criteria which suggest that the trustworthiness of research involves establishing credibility, transferability, dependability, and confirmability. As the concepts of ‘reliability and validity’ are contested approaches in a qualitative inquiry, this research chose to focus on assessing the trustworthiness of the data using tactics that correspond to the different methods and techniques adopted in the Research Approach.

3.3.1 Tactics to Maintain the Quality of the Research

The process of eliciting knowledge related to heritage products, its outcomes, and areas of application are directly connected to the propositions. Therefore, the research activities and the outcomes of the design intervention sessions become the primary considerations in maintaining the quality of the research. Apart from that, to collect this data, other supplementary data are required to support its initiation as well as provide a better understanding of the relevant outcomes of the research. The supplementary data refers to data collected from both descriptive studies—General Descriptive Study and Specific Descriptive Study. This subsection discusses several tactics adopted in this research to ensure the trustworthiness of the data collection.

Research Design: Adopting a Multiple-Case Study Approach

The multiple-case study method adopted in the Research Approach demonstrates that the structure and procedure of a case study can be adapted to different contexts. This characteristic relates to the concept of transferability in which the findings are generalizable in another context (Lincoln & Guba, 1985; Yin, 2014, p. 48). In this sense, this research uses the logic behind the replication of the structure and procedure in each case study to indicate that the conditions of a case study developed in this research can be adapted to various background settings.

Apart from the general structure of the case study, this research also uses a similar setup and tools in the design intervention sessions. This approach ensures that the same procedure can be implemented across multiple cases. This tactic relates to the ‘dependability’ of the process where outcomes can be replicated and are consistent across different settings (Lincoln & Guba, 1985). This tactic relates to maintaining reliability which refers to the implementation of the same procedure over again;

however, this should not be confused with ‘replicating’ the same result (Yin, 2014, p. 48).

Case Study Database

There are two main tactics used in creating a database for case studies in this research. The first tactic is developing a general database for all the case studies. This database consists of the descriptions of each case study, including the summary of the case, how the case was initiated, the participants involved, the research activities conducted as well as challenges and insights gained from every case study. This data is presented as part of the case study descriptions in Chapter 6. Each case study description is reviewed by a key informant (the informant can either be one of the participants in the design intervention session or an observer who is part of the case study but are not directly involved, for example, the lecturer who assisted in the implementation of a case study). This tactic aims to create a shared perspective on the narratives of the case description and reduces the researcher’s bias in its content. This tactic is similar to the notion of ‘confirmability’ which refers to developing a degree of neutrality on the result based on respondent’s perspectives instead of researcher’s bias, motivations or intentions (Lincoln & Guba, 1985).

The second tactic used in the construction of the database is specific to the design intervention sessions. The database consists of ‘physical artifacts’ (or session’s artifacts) collected by the end of each session, recordings (either audio or video) of the sessions, and the observational notes from the researcher. These three points of data help to build a chain of evidence described in the following title.

The Descriptive Studies: Multiple Types of Data Collection

As discussed in section 3.1, this research consists of two descriptive studies with similar research activities and two different areas of focus. One of the tactics used to maintain the research quality in these studies is collecting different types of data which lead to the same insight. Collecting multiple types of data—or ‘evidence from two or more sources, converging on the same findings’ is one of the tactics mentioned by Yin (2014, p. 102). As the lists of potential data to be collected from the field can be extensive, he shortlisted six types of data as a guideline: documentation, archival record, direct observation, participant-observation, interviews, and physical artifacts (2014, p. 105). Below is the list of the types of relevant data collected during the descriptive studies:

- i. Text and visual documentation from direct observation in relevant settings. For example, visits to companies, trade-fairs, craft workshops, and local villages.
- ii. Recordings of open-ended and semi-structured interviews with local stakeholders in audio, video and/or notes.
- iii. Physical artifacts such as brochures, corporate company profiles, and reports collected from the field visits.

- iv. Descriptions of the situations and settings that led to the collaboration efforts with local stakeholders for the design intervention.

The Design Intervention Session: Multiple Types of Data Collection

Similar to the tactic used in the descriptive study, the quality of data collected from the design intervention session also relies on multiple sources of data collection. The types of data collected in this approach relate to the content, activity, and outcomes of each session. The physical artifacts are particularly important as they will be the primary data used in the analysis for this research. Below is the list of the types of relevant data collected during the design intervention sessions:

- i. Recordings of the sessions in either audio or video.
- ii. A collection of pictures of the selected heritage products.
- iii. Session's artifacts (or physical artifacts) which are the outcomes of each session and also the material created by the participants.
- iv. A short questionnaire for participants to reflect on their experiences in each session.
- v. Field notes of the researcher's experiences during the design intervention

The Design Intervention Sessions: Protocols and Procedure

As highlighted in the previous title, the session's artifacts or data collected from the design intervention sessions are the main data used in the analysis for this research. Each session consists of a set of design tools, steps/procedures for its implementation, and the tangible outcome to be collected by the end of the session. To ensure that participants understand the concept, procedure, and instructions given during the session, this research established three different viewpoints to increase the credibility of the data collected during the design intervention session: the researcher, the participant, and the session's artifacts. These viewpoints aim to ensure that the participants received the right information and instructions, followed the session's procedure and generated the outcome following the session's requirements. The protocol adopted in each viewpoint is listed below:

- *The researcher* – responsible for informing the participants about the objective, the process and the projected outcome of each session. The required activities:
 - i. Give a brief introduction before each session,
 - ii. Prepare and arrange relevant material to be shared with the participants,
 - iii. Available to answer questions from the participants during the session,
 - iv. Facilitate and/or observe the session from a distance to verify its progress.
- *Participants* – to present and share their process and outcome by the end of every design intervention session. This step demonstrates how well the

participants understood the session and it indirectly makes other participants reflect on their own process and experiences as well.

- *Session's artifacts* - the outcome of the session or physical artifacts collected from every design intervention session. For example, sticky notes mapped onto a poster-sized paper. In essence, the content of this 'mapped canvas' reflects their understanding from the session. The material collected from all the cases are also compared for consistencies and anomalies.

Analyzing the Session's Artifacts across Cases

The session's artifacts are similar to Yin's description on 'physical artifact' which refers to data "collected or observed as part of the case study". The description also highlights that "when relevant, the artifacts can be an important component in the overall case" (2014, p. 117). In this research, the session's artifacts are the most important data as they represent content which is directly constructed by the participants during the design intervention session. The artifacts collected in the case studies will be compared and examined in *Chapter 7: Analysis and Discovery*.

3.3.2 Vulnerability and Limitations of the Research Approach

This section presents the vulnerability, limitations and learning points based on the experience in implementing the research approach.

Multiple-Case Studies: Massive data with a variety of insights

A case study approach requires extensive resources, is time-consuming and if it is not properly planned, the researcher may face the risk of drowning with an enormous amount of data with no clue on how to proceed (Yin, 2014). This statement remains true in this research partly due to the elaborate research which requires an extensive amount of resources, and energy to manage its data, research requirements, and expectations. Another factor that adds to this challenge is the richness of data and insights from the field that are critical and vital to the context but not necessarily connected to the research scope. In this research, these challenges are resolved by assessing and evaluating the relevant aspects that are directly related to the scope of the research. Such effort helps the researcher to be aware of insights which are essential to the context but are not related to the propositions. The key element in this effort is a continuous reflection on the insights captured and their connections to the objective of the research.

The Researcher: Managing the different roles throughout this research

Action research is an approach that focuses on the exploration of the local context, building theories and descriptions from the ground-up and can be tested through intervention or experiments (Argyris & Schön, 1989). However, confusion in connection to its research goals often arise as either the method can be used to develop new knowledge, teach the subjects (or participants) or instigate action (Skelton, 2017, p. 30). As discussed earlier, the design intervention approach is considered a form of

action research as it requires a certain level of researcher's participation in its implementation. This method demands a high degree of consciousness by the researcher involved to manage different roles throughout a project, for instances as a researcher, consultant and in some instances as the subject themselves (Eden & Huxham, 1996). "A practitioner is frequently embroiled in conflicts of values, goals, purposes, and interests (Schön, 1983, p. 17)."

Therefore, being aware of the different roles to be assumed by the researcher is critical, especially during the empirical exploration as it requires swift decisions to accommodate the various challenges and requirements as they arise in the field. Being aware of these roles will influence the research's outcome. This research identifies, observes, and reflects on the various roles assumed by the researcher throughout this research:

- General roles—as the researcher
 - i. Observe the context and situations relevant to the research
 - ii. Make field notes
 - iii. Capture the context through pictures
 - iv. Record audio and video
- Roles in descriptive study
 - i. Conducting interviews with local stakeholders
 - ii. Networking to scout potential collaborators
 - iii. As a strategic consultant: developing proposals for product development projects based on potential collaborators' interest and needs
 - iv. Collecting physical artifacts relevant to the scope of the research.
- Roles in design intervention
 - i. Creative facilitator: managing and facilitating the intervention sessions
 - ii. Participant: taking part in the activities within the session (in cases that lack representative from the design domain)
 - iii. Collect and archive session's artifacts

Certain personal biases might have occurred due to managing these various roles as well as keeping up with the different requirements in conducting the case studies. However, these biases are mitigated with the different tactics adopted to maintain the quality of this research (see 3.3.1).

Balancing descriptive studies' findings and design intervention's requirements

Findings from the descriptive studies are based on the real-world context and this has directly influenced the type of participants involved in the design intervention. While the procedure and the type of outcomes of the design intervention sessions are controlled, the type of participants involved are based on the results of the descriptive study.

Hence, the participation of local stakeholders in the research is influenced by the local craft industry settings and their motivations and willingness to collaborate in the research. For instance, from the theoretical perspective, the exchange of knowledge between designers and craftspeople are the main focus of this research. However, the reality in the field can be different. In Vietnam, designer's roles are scarce within the industry and craftspeople are not directly involved in the product development process. Craftspeople are only responsible for making craft products (or its parts) and can be considered as one of the stakeholders in the supply chain. The clients often give new product concepts or design briefs or initiated internally by the local SMEs.

These SMEs are the closest option for a relevant stakeholder to be involved in a product development project. Two local SMEs involved in this research initiated their design collections, and neither one has designers working for the company. In this situation, it is important to adapt the condition of the case study to meet with the circumstances in the field (real-world context). The case study was conducted together with personnel from the local SMEs as they are the identified stakeholders involved in the product development process. This example highlights the importance of 'flexibility' and 'adaptation' in managing research expectations based on the various circumstances and outcomes from the field. In order to manage these situations, it is crucial to grasp a holistic understanding of the critical concepts of the research.

Other challenges in collecting data in the field

There are also other challenges experienced in the field which may influence the implementation of the research approach and its data collection. The first challenge is collecting different types of evidence in the field. Preparation goes a long way to ensure its completeness; however, mistakes can occur, especially when exposed to a different culture, working in the field with new people and at times in an unexpected environment. Basic technical glitches are also to be expected, for example, running out of battery to record when a session extended longer than scheduled, devices that do not work as they should while the session needs to start (time is of the essence as most participants were voluntarily involved during their working hours). Moreover, the field is often less formal than a laboratory thus it is easy to be influenced by the atmosphere leading to an oversight in data collection. These various internal and external factors do influence the researcher's mental and emotional state. Preparation and discipline are common terms found in the literature and this research also stressed their importance and significance on the overall research's result. It is also vital to highlight that these risks can be mitigated, for example by having multiple sources of evidence.

Another challenge is the language barrier, specifically in Vietnam. This challenge influences the selection of the case studies conducted in this research. This means that collaboration with stakeholders that can communicate in English was part of the conditions naturally built into the case studies. While it would have been a great opportunity to be able to eliminate this condition allowing a bigger pool of participants

to scout it does not directly influence the overall outcome of this research as the research does not require a significant amount of data on participants across the industry for its analysis. Next to this, the overall number of case studies performed in this research is also influenced by the limitation of time and resources available.

3.4 Conclusion

This chapter discussed the research approach developed as a strategy to seek answers to the research questions, tactics used to maintain the quality of the research as well as the challenges and limitations in its implementations. In brief, the research approach is shaped by two research strands proposed by Blessing & Chakrabarty (2009): the development of understanding and the development of support. This two-fold methodology is translated into two explorations in this research. The first exploration focuses on understanding the context of the local craft industry and its stakeholders and the second exploration focuses on the use of heritage products as one of the creative resources used the product development process.

This research adopted the descriptive and prescriptive studies from DRM in combination with design intervention approach and multiple-case study method. These methods provide the basis for the structure of the Research Approach. The approach consists of General Descriptive Study—a study that provides an overview of the main context and serves as a platform to initiate the case studies. Each case study consists of Specific Descriptive Study and Design Intervention. Figure 3.6 illustrates the adaptation of the research approach against the conceptual research model introduced in Chapter 2 and the data collected from the Design Intervention sessions will be used in the analysis of this research.

Through these sessions, this research aims to examine the exchange of knowledge between craft and design domains (**P1**), elicit and extract values associated with selected heritage products (**P2**) and explore the adaptation of these values in the generation of new product ideas (**P3**). Furthermore, these values are also probed to elicit elements of sustainability of the past (**P4**). In Chapter 5, this research presents in detail how the data will be collected. Chapter 6 presents the data (in line with the result of the empirical exploration), and Chapter 7 discusses how the data is analyzed and the findings of this research. The next chapter presents the literature review based on the propositions illustrated in the figure. Corresponding to the propositions, Chapter 4 is divided into two parts. Part 1 focuses on understanding and articulating the values of heritage products; Part 2 explores their adaptations in design and sustainability initiatives.

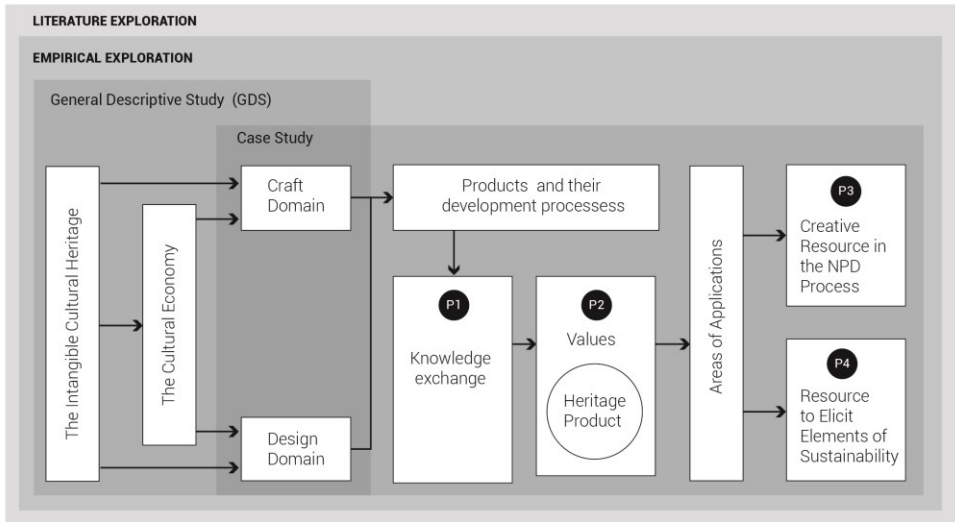


Figure 3.6: The Research Approach and the Conceptual Research Model.

Chapter 4

Theoretical Exploration

This chapter presents the literature review and the theoretical embedding based on the research propositions. The chapter has been divided into two parts: Part 1 focuses on understanding and identifying the values of heritage products and Part 2 presents the adaptation of the values as a creative resource in design and sustainability initiatives.

4 Literature Review

In Chapter 2, the research has presented the conceptual research model and formulated four propositions based on the **RQs**. In essence, this chapter presents the theoretical embedding of the key concepts in connection with the propositions. The chapter is divided into two parts. Part 1 focuses on identifying values of heritage products (**P1** and **P2**) and Part 2 explores two areas of applications for values of heritage products (**P3** and **P4**)

This theoretical exploration demonstrates a ‘hybridization of knowledge’ where concepts from different fields, namely design, heritage, marketing, management, anthropology, and social sciences are explored to conceptualize the key concepts. This approach stimulates cross-fertilization among different fields of expertise in which ‘concepts, methods, theories and praxes’ are adopted; transforming conventional perceptions and nurturing “inter-language and hybrid knowledge communities” (Loulanski & Loulanski, 2016). By adopting this approach, this research expects to bring the concept of heritage into the design discourse, specifically in the context of sustainability and the product development process.

Part 1

Identifying Values of Heritage Products

4.1 Part 1: Introduction

The first part of this chapter is divided into two sections (4.2 and 4.3) in line with **P1** and **P2** (shown below) which will be refined based on this theoretical exploration. Section 4.2 discusses the context of craft and design domains within the cultural economy and the importance of products and their development processes to both domains. The discussion underlines the opportunity for the craft and design domains to exchange their knowledge based on their interest and aspiration in heritage products. The research explores different theories on cross-domain collaboration efforts to identify the mechanism to support such exchange. In section 4.3, the research explores the concept of values in relation to the cultural heritage and products. The discussion begins with an understanding of the tangible and intangible cultural heritage followed by values that are attributed to products. The discussion

continues with the creation (or production) of values and their connection to human interactions. Then, the discussion delves into the concept of values in association with products and the composition of values as a hierarchical system. Both sections end with a conclusion and a refinement of the propositions.

Proposition 1

The craft and design domains' interest in products and their development processes offer an opportunity for both domains to exchange knowledge about heritage products and a chance to transform tacit knowledge associated with these products into a meaningful resource.

Proposition 2

Values are attributed to products; this research proposes that these values are a set of interrelated elements that are shared over time and across generations; and between craft and design domains.

4.2 Craft and Design in the Cultural Economy

Craft is often perceived as a sector that can alleviate poverty, especially in the rural areas (Reubens & van Berkel, 2013; Wan Teh, 1996). Craftspeople are traditionally known as the bearer of local knowledge and its craftsmanship; therefore they typically have a high social standing or status among the local community (Mohlman, 1999). However, through the commercialization of craft, craftspeople's roles are transformed into those of entrepreneurs or contractors-hired as craft makers. As a result, their creative expressions are bounded or directed by the requirements of the clients and the market. Modernization is part of the social evolution that either directly or indirectly permeates into our everyday life and "as the status of a craft object changes due to commercialization, people's own identities and statuses are also subject to change across a wide spectrum of possibilities (Mohlman, 1999)." The influence of modernization through the commercialization of craft can be perceived as an act that disrupts local identities and their traditional practices. However, preservation of traditional practices often requires substantial efforts and resources; a luxury that most emerging countries cannot afford.

Kay Mohlman (1999) presents two different perspectives in viewing craft and its development: craft-as-industry and craft-as-culture. The paper proposes that craft-as-industry can be described as a network of production activities that "resemble or diverge from other kinds of industrial productions." This perspective differentiates the commercialization of craft from other industries as its production processes include various social factors such as local economy, religious, cultural, and politics which influence its growth and development (Cohen, 1989). These factors also highlight its difference to a factory-based approach where production activities are often formal, centralized, and detached from local communities and their cultural identities. In a

way, craft-as-industry is less formal than a factory-based system; it is more social, and embedded as part of the daily activities of its local community. Another factor is the presence of 'key brokers': agents responsible for connecting business enterprises and home-based workers. These agents "function as the social glue" which bind production activities that are scattered among households, villages, and communities. This means that, even though craft-as-industry may resemble a modern industrial manufacturing system, its production activities are closely intertwined with the local fabric and its social formations.

Craft-as-culture is represented by the close relationship between the maker and the craft itself; an intimate relationship that connects a person's identity and social status to the objects he/she created. In a way, the production of craft objects emulates the craftspeople's identity as well as his/her position within the social structure. This means that the act of making is more than a production process, but it is part of individuals' expressions, personalities, as well as the journey in life, for example, in "marriage, birth and death" (Mohlman, 1999). This perspective presents the notion that people make the craft and at the same time craft also makes or defines the people (Mohlman, 1999). In this context, the act of making craft products is not only the production itself but rather the embodiment of the local culture and its identity. This perspective highlights the significance of cultural elements in craft products and also the loss of such elements in contemporary craft products (Mohlman, 1999).

These two perspectives highlight the complexity of craft as part of the commercialization process as well as craft as part of social identities (Mohlman, 1999). Furthermore, they also provide the lens for this research to understand the aspects associated with culture in craft and factors related to the commercialization of craft. This research uses these perspectives to assess craft products as both commercial products and heritage products.

These dual perspectives also resonate with the definitions of traditional crafts and contemporary crafts products defined within the context of the cultural economy. This research has introduced the concept of cultural economy and its connection to the craft and design domains according to the Framework for Cultural Statistics by UNESCO (see 2.1.1). The paradox between these two domains is that although both domains have valuable knowledge of products and their development processes they do not seem to be working together effectively and efficiently. One of the contributing factors that led to this circumstance is the tacit nature of their knowledge and experience. In brief, the craft domain is often associated with traditional forms of knowledge while the design domain is regarded as part of a contemporary form of knowledge that deals with 'wicked problems.'

4.2.1 Craftspeople and Traditional Knowledge

Traditional knowledge is part of the cultural heritage. Pessoa, Deloumeaux, and Ellis (2009, p. 91) define traditional knowledge as “the knowledge, innovations, and practices of indigenous and local communities around the world. Developed from experience gained over the centuries and adapted to the local culture and environment, traditional knowledge is transmitted orally from generation to generation.” This type of knowledge is often shared within the local community in the form of “stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language and agricultural practices”(Pessoa et al., 2009).

Local craftspeople are one of the prominent bearers of such knowledge as they learned and acquired knowledge that has been passed from one generation to another. Elements related to craft such as “material, tools, techniques of the body, and practical skills” are considered open, collective and highly social (Ravetz et al., 2013, p. 3). In essence, traditional knowledge is embedded in the process of producing craft products (Sennet, 2009).

Like other traditional knowledge, craft knowledge often comes in the form of tacit knowledge. Although in theory there should be a balance between the tacit and explicit forms of knowledge between craftspeople and their context, the former often dominates in reality (Sennet, 2009, p. 79). The tacit knowledge in craft relates to ‘personal know-how’ as well as collective practices (Dormer, 1997, p. 149). Over time, the knowledge that has been passed on from one generation to another becomes “a repository of ancient skills and traditions” (Ravetz et al., 2013, p. 4). This is one of the reasons why craft and its knowledge system are central to the ongoing socio-economic discourse (Ravetz et al., 2013, p. 73) as they are connected with the local communities, their environment, social context and cultural heritage (Tung, 2012). Understanding the culture of craft offers a means to observe the knowledge and capability of the previous societies in constructing their surroundings (Sennet, 2009, p. 15) individually and collectively.

Knowledge of the People

Soetsu Yanagi (1889–1961) was a leader of the *‘Mingei’* (‘art of the people’) movement in Japan in the 1930s. In his book *The Unknown Craftsman*, he highlighted that the craft domain comes into being “from a person’s making things for his own use (Yanagi, 2013, p. 205).” Fundamentally, such action requires close connections and understanding of the local resources and materials. He emphasized the principle of adapting what nature has to offer rather than focusing on human needs and wishes by stating that “the closer we are to nature the safer we are; the further away, the more dangerous (Yanagi, 2013, p. 215).”

He classified craft products into four categories (Kikuchi, 1997; Yanagi, 2013):

- *Aristocratic craft*—products that are often embellished with detailing and delicate decorations that demonstrates power or richness by the ruling aristocracy and the noble families (Wan Teh, 1996, p. 131). These creations are often supported through a patronage system (Yanagi, 2013, p. 198).
- *Industrial craft*—mass-produced items such as machine made cutlery, pots, and pans. These products are part of the manufacturing industry and are mainly produced via mechanization.
- *Individual or Artist craft*—unique pieces of products that are “made by a few for a few, at a high price and are consciously made and signed (Yanagi, 2013, p. 198).” This type of crafts can also be identified as “art-craft, design-craft, and studio craft (Dormer, 1997, p. 151)”.
- *Folkcraft*—Also known as ‘Getemono’, these products are cheap and made in quantity. They are “unself-consciously handmade and unsigned for the people by the people (Yanagi, 2013, p. 198)”. These products are simple, basic and practical; created for daily used and typically crafted by the local people during their spare time. For example, mats, baskets, traps, and clay pots (Wan Teh, 1996, p. 131).

Figure 4.1 illustrates these four categories of craft products against a Y-axis representing traditional and contemporary products and an X-axis that represents products that are created for the masses and those that part of special or limited productions. It can be seen from the figure that industrial craft and folkcraft is considered as part of craft-as-industry while folkcraft and aristocratic craft is part of craft-as-culture. Next to this, individual or artist craft is considered to be part of craft-as-art. The figure highlights that folkcraft is associated with both craft-as-industry as well as craft-as-culture; presenting an interesting as well as relevant insight for this research to focus on this particular category.

Folkcraft is anonymously made and closely connected to the community (Kikuchi, 1997; Yanagi, 2013). Folk represented a group of people within a certain boundary and characterized based on specific shared attributes (Foster, 1991). The characteristics of folkcraft suggest local people’s capabilities in making use of natural material and local resources available, using various tools, and developing techniques and craftsmanship required to create such objects (Sennet, 2009, p. 11; Yanagi, 2013, p. 200). The position of such objects within a community is similar to contemporary everyday products. Hence, exploring and understanding these products can offer a means to understanding the life of the previous societies—how they lived, their trade patterns, traditional beliefs, habits, rituals, and cultural traditions. Folkcraft represents knowledge of the people that has been collectively accumulated and transmitted from one generation to another. It consists of common household objects, artifacts with

utilitarian values—products that are made for everyday needs and serve the needs of everyday people. These products are common and still widely available within the craft industry and its communities, especially in emerging countries.

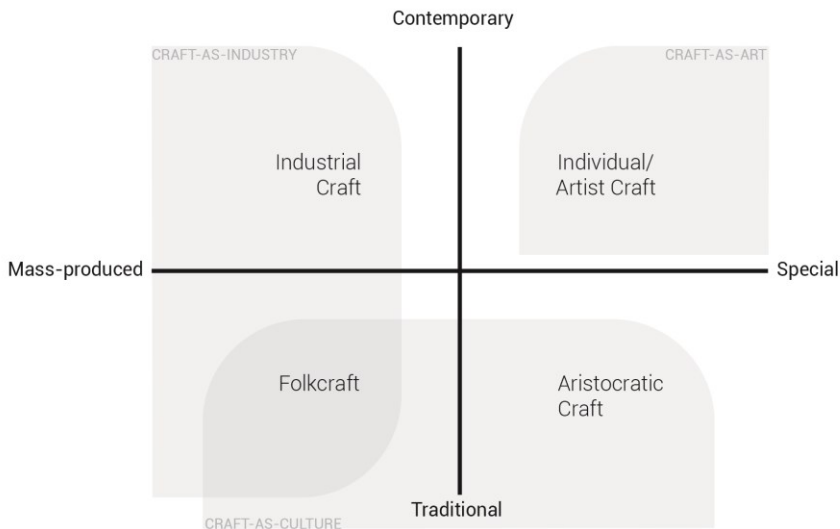


Figure 4.1: The matrix of craft products.

Long before the field of design was established, craftspeople were the ones who fulfilled the role of designers within their community. They are known for their skills and craftsmanship with specific and refined bodily movements; they explored and practiced different methods using their tools, and experimented with different materials (Sennet, 2009, p. 11) in order to create products. To some extent, the craft domain has accumulated a certain amount of design knowledge through the development of local craft products. However, the adaptations of this knowledge in the design field are limited. Tung (2012) highlights the need for the craft domain to identify the various resources available within its community. Such understanding and awareness can be a starting point for the craft domain to offer and exchange their knowledge with other domains and industries. In this research, the focus is on connecting the knowledge in craft with the design domains.

4.2.2 Designers and Contemporary Knowledge

In an editorial titled *'Forty years of design research'*, Nigel Cross (2007) highlights that as a discipline design has established its own scientific understanding based “on a reflective practice of designing.” This notion is connected to Donald Schon’s (1983) perspective in his book *'The Reflective Practitioner'* that highlights the need for “an epistemology of practices implicit in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness and value conflict (p.49).” As highlighted in Chapter 1, design related tasks are considered part

of an area that dealt with ‘wicked’ or ‘ill-structured’ problems (Buchanan, 1992; Coyne, 2005; Cross, 2007). ‘Wicked problems’ are subjected to change, and they evolve; essentially, there is no definite solution to a wicked problem; instead, its solutions are often pragmatic and usually irreversible (Coyne, 2005). It is a challenge for designers to foresee “what does not yet exist”, but “the solvers have no right to be wrong—they are fully responsible for their actions” (Buchanan, 1992). Design as a practice also consists of the paradox between creating something new yet still recognizable and understandable by its audiences (Krippendorff, 1989). Therefore, although designers’ activities are often oriented toward the future, their process is heavily influenced and informed by both the present and the past (Van Boeijen, 2015, pp. 33–34).

A design process starts with the intent to solve a certain wicked problem (Buchanan, 1992; Coyne, 2005; Cross, 2007) and creates certain value offerings by utilizing various elements such as “forms, colors, textures, materials, affordances, symbols and metaphors” (Boztepe, 2007). Within the design field, efforts to solve wicked problems come from a wide range of perspectives, such as, the product and its aesthetics (Hekkert & Leder, 2008), the innovation process (Buijs, 2003), ergonomics (Green & Jordan, 1999), sustainability (Brezet & van Hemel, 1997; Crul & Diehl, 2008), context and its variations (Kersten, Diehl, Crul, & Van Engelen, 2015, 2016), material (Karana, 2009; Karana, Hekkert, & Kandachar, 2008), branding (Roscam-Abbing, 2010), strategic design and marketing (Best, 2010; Verganti, 2009), users and their interactions (Desmet & Hekkert, 2007; Sanders & Stappers, 2008), human emotions (Jimenez, Pohlmeier, & Desmet, 2015; Norman, 2013) nature (de Pauw, 2015; McDonough & Braungart, 2002), and culture (Chuang & Chang, 2012; Lin et al., 2007; Van Boeijen, 2015), to name but a few. This list includes only a minuscule example of the different types of knowledge established within the field of design.

These examples demonstrate that research conducted within the design domain has led to numerous explorations in understanding the nature of designing, as well as methods to tackle design problems. These explorations include the use of content from cultural heritage as a source of inspiration for fresh ideas and new perspectives. Designers are considered the key stakeholders in the development of goods and services with local cultural content (Wang, Bryan-Kinns, & Ji, 2016). Such explorations have resulted in various contemporary products embedded with cultural added values (Chuang & Chang, 2012; Hagiwara & Price, 2006; Hara, 2014; Lin et al., 2007; Tung, 2012). However, although studies related to culture are common within the design discourse, those that specifically focus on heritage are still nascent. This research views culture as a bearer of heritage and based on this perspective there are certain opportunities to explore its roles and influences in the design process. In a way, exploring aspects related to heritage can be an extension of cultural oriented studies within the design field.

4.2.3 Opportunity via Knowledge Exchange

In Chapter 1, this research presented the opportunity for craft and design domains to explore each other's knowledge and expertise in products and their development process. The previous two subsections (4.2.1 and 4.2.2) have discussed the foundation of knowledge for each domain, respectively, and demonstrate why their perspectives are fundamentally distinct from each other. The craft domain comes into being when people start to make objects for their own daily needs whereas the design domain was initiated as part of the response to the industrial development, and focuses on exploring the myriad of ways of solving wicked-problems for the mass market. Both domains have evolved separately; however, one key aspect that brings them together is their interests and aspirations in products. Sharing their knowledge about existing products can be a way of bringing these two domains closer in a meaningful way.

The discussion in subsection 4.2.1 identifies a type of craft products that are relevant to this research—folkcraft. Folkcraft is part of everyday objects of the local community and plays a prominent role in the development of the local craft industry. These everyday objects are important to craftspeople and also intriguing to designers. Designing everyday objects is one of its core establishments within the design domain; hence, this research perceived that the theories established in design could be applied to folkcraft products as well. Folkcraft is part of traditional craft products, and as discussed in Chapter 1, these products are considered to be heritage products (definition box in 1.1.2). These insights influence the decision to focus on folkcraft as the type of heritage products explored in this research.

Apart from the opportunity to share and exchange knowledge about heritage products and their development process, this research also identifies the need for articulating the tacit knowledge related to folkcraft products into explicit forms.

Articulating Tacit Knowledge into Explicit Form

The resources within the cultural economy are heavily influenced by the intangible cultural heritage of which tacit knowledge is one of the major components (UNESCO, 2013, p. 24). The craft domain itself is regarded as one of the repositories of local cultural heritage where histories of everyday people are accumulated (Ravetz et al., 2013). Knowledge within the craft domain is commonly transferred in a tacit form (Dormer, 1997, p. 147; Sennet, 2009, p. 78; UNESCO, n.d.-b); this is partly due to craft's reliance on knowledge-in-practice, in which knowledge is stored "in the hands and minds of the practitioners" (Eyferth, 2010). This conventional method of knowledge transfer often focuses on the relationship between masters, apprentices, and their local context (Ravetz et al., 2013, p. 74). Therefore, without additional channels of knowledge transfer other than the tacit transfer from master to apprentice, the loss of the master (or the knowledge bearer) also means the loss of the knowledge. It is not surprising that the loss of tacit knowledge is a pressing and challenging issue

within the craft domain and this situation highlights the need to articulate tacit knowledge into explicit forms (Galla, 2008; UNESCO, n.d.-b).

In order to sustain and conserve knowledge, it must be transferable. In that sense, explicit knowledge—namely, a piece of knowledge that has been formulated and codified—is easier to disseminate than its tacit counterpart, which requires individuals to be present for it to be accessible (Lam, 2000). Furthermore, explicit knowledge makes knowledge resources manageable, thereby improving the knowledge wealth of an organization (Kreiner, 2002) or, in the context of this research, the knowledge wealth of a local community and the craft industry. Kreiner (2002) highlights two concerns in managing knowledge resources: 1) the need to safeguard and make use of the resources, 2) promoting the mobilization and growth of the resources. Tacit knowledge is transferable via two methods (Diehl, 2010, p. 16; Nonaka, 1994):

- *Socialization*—in which knowledge is shared among individuals and therefore preserved in its tacit forms.
- *Externalization*—in which knowledge is articulated into an explicit form that can be accessed by outsiders.

The first method, socialization reflects on the common method practiced within the craft domain. However, the second method, externalization can be difficult. It requires constructive collaborations, in which mutual trust is important in order “to share one’s original experience [which is] the fundamental source of tacit knowledge” (Nonaka, 1994). Collaboration nurtures a common perspective among parties involved, generating shared experiences (Nonaka, 1994) as well as knowledge exchange (Tung, 2012). However, facilitating knowledge exchange between stakeholders from different fields of expertise is often challenging (Carlile, 2002). To manage such ‘sticky’ situations, a concrete understanding of how craft and design domains can “effectively share and assess each other’s domain-specific knowledge (Carlile, 2004)” is crucial in this research.

In brief, articulating a part of tacit knowledge in an explicit form increases its chance of being disseminated and its capacity to be accessed, learned and adopted by outsiders. As such, there is a particular need, as well as an interesting opportunity from the perspective of this research: (a) to find a means to support and stimulate knowledge exchange between craft and design domains, and (b) to make aspects of the shared knowledge explicit. In line with these opportunities, this research explores the theories and discussion on cross-domain collaboration efforts.

4.2.4 Cross-Domain Collaboration Efforts

Cross-domain collaboration is a platform where several stakeholders can apply their knowledge and experiences whilst influencing the process and its outcomes (Santos, Capet, & Diehl, 2013). This effort is implemented when various resources and

capabilities are required to improve current conditions, yet specific inputs are not internally available; therefore, external resources need to be mobilized (Balderbos, Carree, & Lokshin, 2004; Das & Teng, 2000). In order to collaborate, stakeholders need to be aware of the knowledge inherent within their domains that might be of value to others (Pisano & Verganti, 2008; Tung, 2012). By understanding what kind of resources can be offered during collaboration efforts, stakeholders can better understand their motivations, identify relevant partners, and determine their roles in the process (Nieto & Santamaria, 2007). The understanding and awareness about the resources that are required for development and those that can be offered to others are vital in the initiation of cross-domain collaboration efforts.

Previous craft-design collaboration efforts have included craftspeople both in the manufacturing process and as part of the research team (Yair et al., 1999). There is ‘a boundary crossing’ or an overlap of periphery between craft and design within the scope of the product development process (Yair et al., 1999). Within this boundary, craftspeople become one of the contributors in the product process. This contribution is feasible due to the dual-nature of craft—to design and to produce. Nevertheless, there are several reasons why collaborative efforts between craft and design remain a challenge. Although collaborative efforts through craft can potentially reconnect “what has historically been broken” (Ravetz et al., 2013, p. 74), these efforts have “not been systematically debated or written about” (Ravetz et al., 2013, p. 4). In some instances, collaboration within the craft domains may have adverse effects. A typical concern is the fact that any cooperative work with outsiders can potentially result in the saturation of knowledge in comparison with the conventional methods of knowledge transfer which focus on the holistic relationship between the master and apprentices (Ravetz et al., 2013, p. 8). However, these conventional methods are losing their place in today’s society (see 4.3.2). Hence, short-term craft-design collaboration efforts can be a viable solution to mitigate this problem as they offer the means to share part of the tacit knowledge inside and outside the craft domain.

According to Yair, Tomes, and Press (1999) craft-design collaboration efforts are also similar to collaboration in general:

- Inputs from all the stakeholders involved are appreciated and respected;
- Inputs are based on stakeholders’ domain-specific knowledge; and
- Both require effective means of communications among stakeholders.

However, sharing a new collaborative space can be destabilizing, discomfoting and filled with uncertainty (Ravetz et al., 2013, p. 21). It invokes ‘resistance,’ ‘friction,’ and ‘intelligent disruption’ that is capable of breaking certain patterns of thought (Adamson, 2013, p. 249). This demonstrates that collaboration instigates a space for critical reflection, especially when one needs to examine one’s automated and typical thought process that is ‘so familiar that it seems natural’ and therefore, hardly

questioned at all; a concept known as ‘defamiliarization’ (Bell, Blythe, & Sengers, 2005). Furthermore, the benefits of collaboration can come to bear long after the end of the efforts, for instance, a new direction may have been indirectly influenced by the experience (Adamson, 2013, p. 249). Although cross-domain collaborations offer a platform to reflect on internal knowledge, acquire new knowledge, and nurture relationships through shared experiences, it is also crucial to emphasize the temporary nature of such efforts (Ravetz et al., 2013, p. 13).

In essence, collaboration can initiate the exchange of knowledge between domains; it is also part of the fundamental approach in knowledge-intensive processes such as the new product development process (Sanders & Stappers, 2008). Tung (2012) suggested that through collaboration efforts local craft industries can potentially share their knowledge as well as gain knowledge from outsiders. Knowledge exchange is indispensable in stimulating local development (Tung, 2012); therefore, collaboration can be an insightful, fruitful platform for mobilizing knowledge between craft and design domains.

Nevertheless, facilitating knowledge exchange in cross-domain collaboration efforts is often challenging (Carlile, 2002). This effort can be a struggle due to practitioner’s reliance on their domain-specific knowledge (Halpern, Erickson, Forlano, & Gay, 2013; Nicolini et al., 2012) that is “localized, embedded, and invested” (Carlile, 2002). These characteristics form a barrier in a cross-domain collaboration effort as experts often perceive objects and content shared during a collaboration process based on their specific field of expertise (Nicolini et al., 2012). These insights highlight the need for this research to understand how craft and design domains can effectively share and assess each other’s domain-specific knowledge. The next title explores the roles of different objects in cross-domain collaboration efforts in which the objects served as the supporting mechanism in the exchange of knowledge across domains.

Objects in Cross Domains Collaboration Efforts

Numerous researchers have used objects as the lens to understand cross-domain collaboration (Nicolini et al., 2012). Carlile, Nicolini, Langley and Tsoukas observed that “objects, artifacts, and materials are part of the construction of our artificial environment, support human interactions and play an active role in sustaining social relationships (2013).” Studies related to the ‘things that are made of matter’ and their influences in our social constructions present a critical aspect of understanding the structure of how we perceive our world. They also mention that “matter generates consequences in our life but so does the attribution of materiality (Carlile et al., 2013, p. 5).” This signifies that the physicality of objects and the way we perceive them are essentially influenced by our relationships, daily interactions, and social constructions.

Nicolini, Mengis, and Swan (2012) present a framework for identifying and understanding different objects and their roles in cross-domain collaborations (shown

in Table 4.1). This framework has been developed using a pluralist approach in which the roles of objects in cross-domain collaboration efforts are analyzed based on multiple theoretical perspectives. According to this framework, objects are capable of assuming multiple roles throughout a collaboration process. Hence, by identifying and understanding these objects, their roles and characteristics we can learn about factors that drive or disrupt collaboration efforts.

Objects of collaborations	Main Roles	Theoretical approach
Primary objects	Create motivations to drive a cross-domain collaboration effort.	<ul style="list-style-type: none"> ● Epistemic objects ● Activity objects
Secondary object	Act as a medium of translation across different boundaries or domains.	<ul style="list-style-type: none"> ● Boundary objects
Tertiary object	Represent the basic infrastructure to support a collaboration process.	<ul style="list-style-type: none"> ● Infrastructure theory

Table 4.1: Objects and their roles in cross domain collaboration (source: Nicolini et. al. 2012).

The framework suggests three levels of objects with the capacity to support cross-domain collaboration. *Primary objects* instigate collaboration by creating motivations that bring people together. Such objects play a prominent role in mobilizing stakeholders' interest and commitment in the early stage of a collaborative effort and can be explained using the theory of epistemic objects and activity objects. The *secondary objects* are capable of bridging and facilitating tasks across different disciplines. These objects can be described using the theory of boundary objects in which objects act as a medium for translating and transforming knowledge across different domains. Finally, *tertiary objects* represent the basic infrastructure required in collaboration efforts, in general. For example, a communication system, a working space, or tools required in the process. This framework identifies three primary roles in which objects can support cross-domain collaboration efforts:

- A point that brings stakeholders together in the early stage of collaboration;
- A medium that facilitates the activities performed by stakeholders from different fields of expertise; and
- The infrastructure that supports the background activities throughout the collaboration process.

Figure 4.2 illustrates three theoretical approaches based on the framework of Nicolini, Mengis, and Swan (2012). Two of these theoretical approaches are directly relevant to this research:

- i. *The theory of epistemic objects* in the early stage of the collaboration process, which represents the means for examining characteristics of objects that are capable of bringing craftspeople and designers together.
- ii. *The theory of boundary objects* during the collaboration process, which supports the understanding of the roles of objects in stimulating knowledge exchange across two knowledge domains.



Figure 4.2: Relevant theoretical approaches in cross-domain collaboration.

This research disregards the third theory, the infrastructure theory, as it refers to general objects used in collaboration efforts, for example, email systems, and tools such as sticky notes, paper, and so forth. Although these objects are an essential aspect in a collaboration process, they are not directly connected to the scope of this research.

Epistemic Objects

The word ‘epistemic’ means ‘relating to knowledge’ (Oxford, n.d.) thus epistemic objects can be loosely defined as ‘objects relating to knowledge’. Cetina (1997) specifies them as ‘object of inquiry’ while Ewenstein and Whyte (2009) define them as objects that are “abstract in nature”, dynamic, change almost instantly, and evolve continuously. They quote Cetina (2001, p. 181) who mentioned that such objects have the “capacity to unfold indefinitely”, presenting a continuous point for inquiry. Another interesting characteristic of an epistemic object is its capability to present different qualities depending on the different projections or lenses used to understand its content (Miettinen, 2005), arousing interest as a target for exploration (Nicolini et al., 2012). This means that an object is considered epistemic when it manifests elements from different domains triggering the interest for inquiry. Due to their complexity and abstractness, these objects are also capable in forming relationships with different audiences. Such interest and emotional connections can create a basis for mutual recognition and sense of belonging (Nicolini et al., 2012).

These characteristics make epistemic objects an interesting source for innovative ideas and solutions as well as a means to comprehend social practices (Miettinen, 2005). These characteristics are used as a reference during craft-design collaboration efforts to examine the roles of heritage products in:

- Representing personal and social connections;

- Triggering interests for inquiry of two knowledge domains; and
- Functioning as a source of creative ideas

Boundary Objects in the New Product Development Process

When different domains work together knowledge boundaries are created; in this circumstance, boundary objects can be used as a medium of translation (Carlile, 2002). Following the framework by Nicolini, Mengis, and Swan (2012) (Table 4.1), *secondary objects* refer to objects that are used to facilitate works involving stakeholders in cross-domain collaborations. This research adopts the concept of boundary objects in the new product development process as proposed by Carlile (2002) as a guide to stimulate the exchange of knowledge between craft and design domains. Based on this theory, knowledge across domains can be represented, learned, and transformed (Carlile, 2002; Star, 1989) through the use of boundary objects.

Boundary objects are objects that can be shared across different contexts (Carlile, 2002; Star, 1989) and function as a medium to translate knowledge between different fields of expertise (Lee, 2007; Nicolini et al., 2012). Carlile (2002) identifies three traits of effective boundary objects:

- Allow the representation of different knowledge domains;
- Aid learning about similarities and differences between domains (e.g., terminology) as well as about their dependencies and contradictions; and
- Allow current knowledge to be transformed into something new (or different) through a collective effort.

This research adopted four different categories of boundary objects as proposed by Star (1989) and expanded in the context of the new product development process by Carlile (2002) to describe the process of knowledge exchange across craft and design domains. These categories are platonic objects, standardized forms, maps of boundaries, and repositories.

First, *platonic objects* refer to objects that are considered to be vague, abstract and independent and able to represent different knowledge domains and symbolize communication and cooperation (Carlile, 2002; Star, 1989). The characteristics of objects within this category are similar to the characteristics of epistemic objects. Second, *standardized forms* are methods of common communication (Star, 1989) which are necessary to reduce domain-specific interpretations; they represent a shared syntax that needs to be learned, understood, and adopted by representatives across domains (Carlile, 2002). Third, *maps of boundaries* represent boundary objects that can generate a shared platform capable of adapting to different domain-specific content (Star, 1989) and operating at a systemic level (Carlile, 2002). Fourth and lastly, *repositories* refer to a database established based on standard reference points and constructed from collective resources (Carlile, 2002), and compiled in a

standardized manner (Star, 1989). In 2010, Star highlighted that these categories are not necessarily exclusive but instead are open for adaptation based on relevant contexts and circumstances.

The combination of different types of boundary objects represents a scaffold that facilitates the exchange of knowledge. Star (2010) suggests that such a structure can be developed in infrastructure or at an early stage of creating a standard. An example of an infrastructure in this sense is a coordinate system used in maps that functions as a standard framework for different cartographic information (Star, 2010). This infrastructure contains a set of 'well-structured boundary objects' that are capable of providing information across different domains. When objects are designed to be understood only by a specific domain, they are considered as ill-structured boundary objects. For instance, a hand-drawn map with no coordinates or any common symbols or legends (such as street name, the North arrow, and so forth) can only be shared and understood by people who are involved in the process of drawing the map. Based on the theory of boundary objects, an infrastructure represents a standard system that enables specific knowledge to be shared across different domains. Star (2010) further explains that the development of a standardized infrastructure or system can be a 'complex and longitudinal phenomenon' and they occurred in cycles; from an ill-structured boundary object to a well-structured boundary object. In each cycle, residual categories might be generated in which another cycle of identifying the underlying structure will be required.

Summary

This subsection discussed the theories and structure behind cross-domain collaborative efforts. It underlines the importance of understanding available and required resources and presents the roles of objects in a cross-domain collaborative effort. Boundary objects are capable of bringing two different domains together, stimulating the exchange of knowledge between domains and transforming the knowledge shared into codified form. Two relevant theoretical approaches have been identified: the theory of epistemic objects and the theory of boundary objects. Epistemic objects represent objects of inquiry which are abstract, dynamic, and continuously changing and evolving. The characteristics of such objects are comparable to the first category of boundary objects—platonic objects. Therefore, these two types of objects are clustered together as platonic objects in this research. The remaining three categories are standardized forms, maps of boundaries, and repositories. Through the use of boundary objects, this research aims to examine how the exchange of knowledge across domains can be represented, learned, and transformed.

4.2.5 Conclusion

This section presents the theoretical explorations conducted based on **P1**. Figure 4.3 illustrates the position and connection between craft and design domains against the backdrop of the cultural economy. The discussion highlights the importance of the product development process for both craft and design domains. The craft domain is known as the bearer of traditional knowledge while the design domain has established a field of scientific understanding on the process of solving complex problems. Concerning their knowledge of the product development process, the craft domain is often affiliated with the traditional way of making products whereas the design domain is associated with contemporary methods of developing products; namely commercialization and industrialization. Although the relationship between craft and design domains seems characterized by opposing views, theoretical findings suggest that they can be complementary and mutually supportive. Accordingly, there is an opportunity for both domains to collaborate and share their knowledge in a meaningful way.

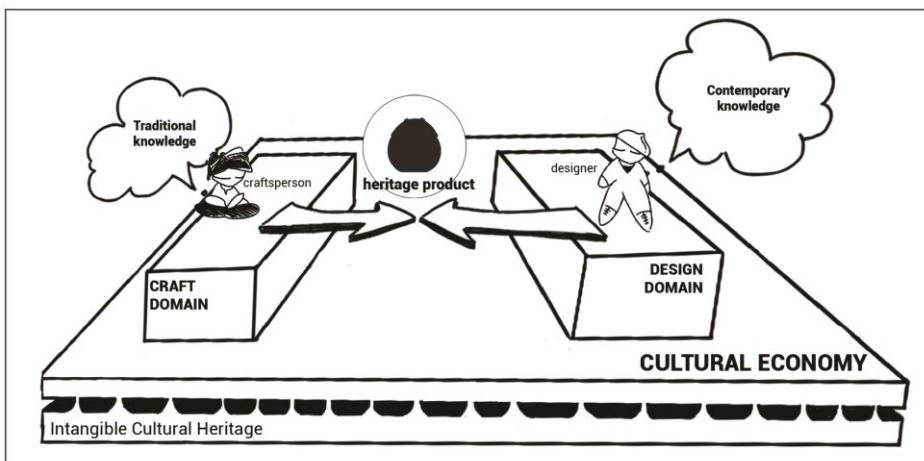


Figure 4.3: Craft and design domains in the context of cultural economy.

To operationalize this finding, this research focuses on the knowledge and perspectives on folkcraft-products that are closely connected to local craftspeople and represent a point of interest for designers. Folkcraft is a category of craft products that can be associated with both craft-as-industry and craft-as-culture. Their influences are prominent within the craft industry, especially among the emerging economies. Folkcraft can be considered as heritage products bearing local knowledge that has been collectively accumulated and transmitted from one generation to another. However, knowledge related to these products is often tacit, precluding such knowledge from being efficiently utilized or effectively adopted as a creative resource for the product development process. The knowledge associated with heritage products

is also connected to the intangible cultural heritage; a transversal domain that can drive the development of the cultural economy (see 2.1.1).

Articulating part of tacit knowledge into an explicit form increases its potential and opportunity of being disseminated and improves its capacity to be accessed. This insight presents a certain need, as well as a fascinating opportunity for this research to make some aspects of tacit knowledge related to folkcraft explicit. To realize this objective, this research adopted the theory of boundary objects which offers the means to examine how knowledge between craft and design domains can be represented, translated, and transformed into codified forms in cross-domain collaboration efforts. This research focuses specifically on 1) aspects that can potentially bring craft and design domains together, and 2) a combination of boundary objects to support the process of knowledge exchange between the craft and the design domains. The definition box below presents the definition of boundary objects in the context of this research:

DEFINITION BOX

Boundary Objects

A selection of objects in a cross-domain collaboration effort that can bring the craft and design domains together, stimulate the exchange of knowledge across domains, and offer a structure to examine how knowledge can be represented, translated, and transformed into a codified form.

Based on the theoretical discussion, this research revisited **P1** and refined its content (shown below). The highlighted content presents the segment within the proposition which has been refined based on the theoretical findings.

Proposition 1

The craft domain and the design domain interests in products and their development processes offer an opportunity for both domains to exchange their knowledge about heritage products and a chance to transform the tacit knowledge associated with these products into a meaningful resource.

Proposition 1a

The craft domain and the design domain interests in products and their development processes offer an opportunity for both domains to exchange their knowledge about heritage products; the theory of boundary objects can be used to examine the exchange and articulate the tacit knowledge associated with heritage products into a codified form.

In the next section, this research continues to explore the concept of heritage products from the perspective of design and cultural heritage studies. This theoretical

exploration is conducted based on **P2** which focuses on understanding the concept of values in association with heritage products.

4.3 Products, Values, and the Cultural Heritage

Chapter 1 introduced the concept of values in association with products underlining that there is more to products than their physical manifestations. Products are capable of acting as a medium to explore our senses, mediating communications among people, and inspiring new ideas. In essence, products consist of values that are attributed to them over time—in the case of heritage products, across generations. A heritage product is defined as a product that has been made and re-made for generations, consists of material and immaterial elements inherited from the previous generations, and is embedded with values that are important to be safeguarded for future generations (see 1.1.2). Before discussing actions for such safeguarding, it is essential to understand the concepts and complexity behind them.

In this section, this research presents a discussion on aspects related to values of heritage products. The discussion begins with an understanding of the cultural heritage, especially on the tangible and intangible cultural heritage, followed by the general concept of values and human interactions as well as the concept of values and satisfaction in association with products. Next, the research explores the values of a product as a set of interrelated elements. The section concludes with the operationalization of the concept of values in association with heritage products, and revisits **P2** for refinements based on the theoretical discussions.

4.3.1 The Cultural Heritage

“Imbued with a message from the past, the historic monuments of generations of people remain to the present day as living witnesses of their age-old traditions. People are becoming more and more conscious of the unity of human values and regard ancient monuments as a common heritage. The common responsibility to safeguard them for future generations is recognized. It is our duty to hand them on in the full richness of their authenticity is found” – The Venice Charter (1964)

The definition of heritage has evolved and transformed over the years (Blake, 2000; Vecco, 2010). Heritage represents the essence from the past compiled into narratives that mimic history but are not necessarily exposed to critical inquiries or comparative analysis (Davison, 2008, p. 35). These compilations are created when knowledge from the previous generations is inherited, practiced, and sustained by the current generation; who, in essence, bear the responsibility for determining what is safeguarded and passed on to the next generations (Harvey, 2010; Tunbridge &

Ashworth, 1996: 6). Hence, these compilations are open and susceptible to change according to people’s perceptions and memories (Giaccardi, 2011b). Shanks and McGuire (1996) highlight that safeguarding heritage is not about how well we understand the past but how its essence is being perceived and practiced in the present. In this sense, heritage retains its significance through interactions with society (Prosalendis et al., 2004, p. 3) and these interactions result in complex relationships between people, their artificial goods, and natural surroundings.

Kirshenblatt-Gimblett (2004) listed three categories for heritage: natural heritage, tangible heritage and intangible heritage. *Natural heritage* refers to areas with unique habitat or threatened ecosystem that are of value from scientific and social perspectives including sites that are in need of conservation (Kirshenblatt-Gimblett, 2004; Pessoa et al., 2009). *Tangible heritage* refers to monuments, buildings, historical sites and artifacts with significant meanings and values (UNESCO, n.d.-a) and *intangible heritage* refers to “the practices, representation, expressions, knowledge—as well as instruments, objects, artifacts and cultural spaces”—that are “constantly recreated by communities and groups in response to their environment, their interaction with nature and their history”, which provides them “a sense of identity and continuity” (UNESCO, 2003). Pessoa, Deloumeaux, and Ellis (2009) included two more categories in the listing; *cultural heritage* representing the tangible as well as intangible cultural heritage and *cultural landscape* representing the combination of natural and cultural heritage. Figures 4.4 illustrates the researcher’s synthesis of the different categories of heritage, and it can be seen from the figure that the intangible heritage is the fundamental element of all categories of heritage.

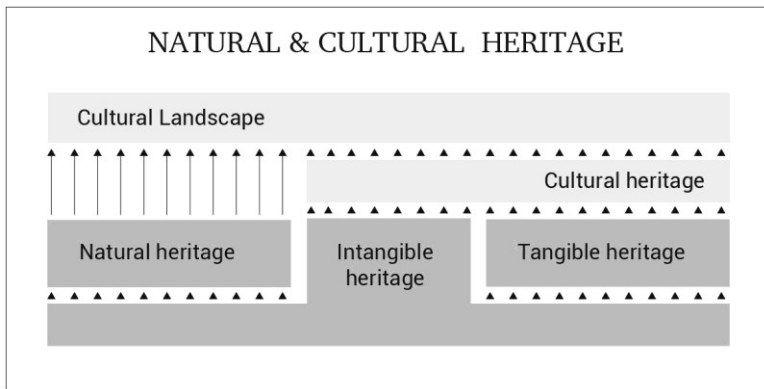


Figure 4.4: The different categories of heritage (researcher’s own synthesis).

The Tangible and Intangible Cultural Heritage

“the Nara Declaration on Authenticity’ which called inter alia for a widening of the framework of ‘authenticity’ to include traditions, techniques, spirit, feeling, historic and social dimensions of cultural heritage” (Munjeri, 2004)

According to the Nara document, our cultures and societies are deeply connected to both the tangible and the intangible cultural heritage (Munjeri, 2004). The intangible cultural heritage gives meaning to the tangibles (Prosalendis et al., 2004, p. 10); hence, all tangible cultural heritage is comprised of values and meanings that are connected to the local context and society (Prosalendis et al., 2004, p. 11). For an extended period, the tangible cultural heritage has been the center for protection and preservation efforts in comparison to the intangible cultural heritage (Munjeri, 2004). The latter is harder to manage as it is not expressed in a permanent physical form and susceptible to change (Prosalendis et al., 2004, p. 2). Even though the tacit and ephemeral nature of the intangible cultural heritage may have contributed to its marginalization its presence can be recognized through various elements such as aesthetic, historical and social values (Vecco, 2010).

In subsection 2.1.1, this research has defined the intangible cultural heritage in the context of the cultural economy. Parts of these tacit elements are embedded within traditional knowledge which consists of compilations of informal knowledge, local innovations, and daily practices developed through centuries of experience and transmitted from one generation to another (Pessoa et al., 2009, p. 91). Within the craft domain, traditional knowledge is considered as knowledge of the people (see 4.2.1). Continuous transmission of such knowledge is vital for the survival of heritage. However, the bearers of such knowledge have established a transmission system that relies on orality rather than written text (UNESCO, n.d.-b). This transmission system is comparable to socialization (see 4.2.3). Due to this approach, the intangible cultural heritage often remained in its tacit form and exposed to the risk of losing its place in the contemporary society—unintended and undetected. According to Galla (2008), there is a significant amount of knowledge connected to the intangible cultural heritage that needs to be transformed into explicit forms. This notion echoes one of the propositions by Prosalendis, Deacon, Dondolo and Mrubata (2004, p. 11), who identify the need to find means to make the intangible cultural heritage explicit, for example, through documentation, writing, and audiovisual media. They further highlight that sustaining and safeguarding knowledge related to the local cultural heritage is important as it nurtures the understanding of local communities and their identities, recognizes cultural diversity—locally and globally—and build cultural capital (2004, p. 1). These insights highlight the needs and benefits of transforming part of the tacit knowledge connected to the intangible cultural heritage into explicit forms. Such efforts are vital in order to:

- Sustain and safeguard the intangible cultural heritage;
- Cultivate local knowledge and enhance communities' identities;
- Develop a better understanding of cultural diversity; and
- Enhance the potential use of the intangible cultural heritage as a resource for future developments.

However, it is difficult to define the intangible cultural heritage as a resource due to its abstractness and ephemeral nature. To resolve this issue, this research focuses on one of the tangible elements of this concept—objects.

Objects and artifacts are part of our cultural heritage; they can be affiliated with either tangible or intangible cultural heritage. The tangible cultural heritage relates to inherited artifacts with significant values that need to be safeguarded for future generations, and the intangible cultural heritage refers to objects or artifacts that are continuously being reproduced and renewed by local communities in accordance with their current social context, environmental circumstances, and historical accounts whilst providing 'a sense of identity and continuity' (UNESCO, n.d.-a, 2003). In subsection 1.1.2, this research has given two examples of such objects defined as heritage products: a tulip vase made by The Royal Delftware in the 18th century and a similar vase made by the company in the 21st century. These two examples illustrate the concept of heritage products. The former is part of the tangible cultural heritage—a physical vase that has been passed on for generations and the latter is part of the intangible cultural heritage which has been made and re-made based on the knowledge, values, and meanings inherited from the previous generations.

These objects and artifacts are considered as part of heritage because they comprise of values and meanings shared and recognized by the society (Munjeri, 2004). This means that the significance of an object associated with heritage relies on its values and meanings to the society. These values and meanings are continuously being attributed and re-attributed through interactions and connections with people over time and across generations. The following subsection explores the general concept of values in order to establish an understanding of values in association with products.

4.3.2 Values and Human Interactions

In principle, there is no centralized structure for the 'theory of value,' and such abstractness might be one of the reasons why this subject has been drawing scholars' attention over the years (Graeber, 2001, p. 1). This situation demonstrates the multifaceted nature of the subject (Babin et al., 1994) with its richness, diversity, and relevance across different fields of studies as well as its significance in society. In subsection 1.2.1, this research underlines a definition of values in association with products following the definition by Parasuraman, Zeithaml, and Berry (1985)

describing values as satisfactory interactions created through an evaluation based on what is expected and what is experienced.

In this subsection, this research discusses what value is and why it is an important topic to this research. In 2013, David Graeber wrote a paper entitled *It is value that brings universes into being*⁴ where he mentioned that:

“there is a fairly widespread feeling among anthropologists that there is something out there that can be called ‘value’ (or maybe ‘values’ or more likely both), and that all human beings do, in some sense, organize their lives, feelings, and desires around the pursuit or furtherance of them, it often seems as if the term could mean most anything. (Graeber, 2013)”

From an anthropological perspective, there seem to be at least two opposite schools of thoughts which refer to 1) the study of ‘value’ in the singular and 2) ‘values’ in the plural (Graeber, 2013). The latter (in plural) refers to the concept of values that are considered good collectively, for example, the moral and ethical aspects of a society (or a social group) while the former (in singular) relates to the production (or creation) of values (Graeber, 2013). This research focuses on the aspects related to the creation of values and emphasizes that when the term ‘values’ is used in this thesis, it does not directly refer to the moral or ethical aspects of the society.

Humans are deeply involved in maintaining and improving the way we live. Our artificial environment⁴ has been developed according to human goals and purposes; goods are created to satisfy our needs, for example, to eat or to travel and these artifacts change according to our aims and vice versa (Simon, 1996, p. 3). Graeber (2001, p. 57) refers to the *‘four moments’* by Marx and Engels which illustrates the fundamental elements or considerations in the production of the ‘material realities’ of our livelihood:

“human beings, in order to exist, not only (1) need to produce basic requirements, like food and shelter; but that (2) the act of producing in order to meet such needs will always create new needs; that (3) in order to continue to exist human beings need to produce other human beings, which entails procreation,

⁴ This research adopted Herbert A. Simon (1996) perspective of the artificial environment which refers to elements of the world with evidence of human artifice.

child-rearing, the family, etc., and that (4) since humans never produce any of these things in isolation, every society must also have relations of cooperation.” (Graeber, 2001, p. 57)

Figure 4.5 presents an illustration of these moments. This research is aware of the various perceptions with regards to philosophy and theories by Karl Marx, however, it only addresses the *four moments* as referred to by David Graeber in his book, *Toward An Anthropological Theory of Value: The False Coin of Our Own Dreams*’ as these moments highlight the key aspects of that are relevant to this research:

- Moment 1 and 2: the need for artificial goods.
- Moment 3: the need for a new generation of people.
- Moment 4: the need for a collective support system (or a community).

Essentially, these moments are established based on “the production of material goods and social relations (Graeber, 2013)” representing the complex relationship between humans, the artificial environment, and the natural environment. The term ‘production’ in this context connotes to the interactions between human to human, human to their artificial environment, and human to the natural environment. From the perspective of this research, these interactions are considered as the fundamental elements of value creations, and they are further described based on three different clusters; a) value-as-action, b) value-as-capital, and c) value-as-consensus.

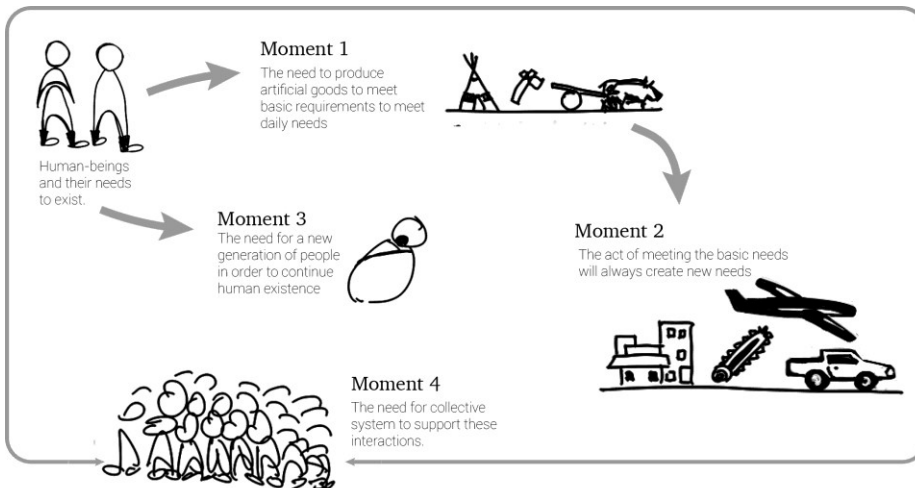


Figure 4.5: The illustration of the 'four moments' based on Marx and Engels (1948).

Value-as-Action

Value-as-action is related to human interactions that create experiences. Boztepe (2007) defines users' value as a representation of evaluations made by the user based on their experiences with certain products or services. These values relate to user's perceptions and are anchored to a context where an 'evaluative judgment occurs' (Zeithaml, 1988); therefore, they cannot exist in isolation (Graeber, 2001, p. 14). Babin, Darden, Griffin (1994) identify two types of values related to consumers' shopping experience; *utilitarian value* and *hedonic value*. *Utilitarian value* relates to functional or task-based experience in which the results are practical, for example the process of buying a ring for a wedding ceremony and a loaf of bread for breakfast. *Hedonic value* describes the emotional aspect of the experience; for example, the sense of joy, happiness, and nervousness of selecting a wedding ring whereas the emotions involved in buying a loaf of bread would be very different depending on the context. *Hedonic values* are personal, subjective and intangible in nature (Babin et al., 1994; Sanchez-Fernandez & Iniesta-Bonillo, 2007; Tasci, 2016). This means that the act of buying a loaf of bread is always observable, but the emotions created through the experience vary from one individual to another. Value-as-action refers to the result of a person's direct interactions with people, the artificial, and the natural environment and such interaction can be expressed based on the evaluation of our actions and emotions. This evaluation process will be discussed in detail in the following subsection (4.3.3) entitled '*Values, Products, and Satisfactions.*'

Value-as-Capital

From an economic perspective 'value' is viewed as capital that can be exchanged. 'Value' is associated with 'utility or desirability (Sanchez-Fernandez & Iniesta-Bonillo, 2007)'; therefore, when its worth can be evaluated and agreed upon; it is eligible to be traded (Boztepe, 2007; Graeber, 2001). The concepts of utility and desirability are similar to '*utilitarian and hedonic values*' as proposed by Babin, Darden, and Griffin (1994). Boztepe (2007) identifies 'values as exchange' to be determined in terms of price, i.e., measured by its relation to the monetary value offered or required during a transaction. Our economy today is reliant on the 'value of money' and the system has established money as the standard used to measure values (Graeber, 2001, p. 66). Hence, the discourse on this topic is often oriented based on the exchange of goods or services with monetary value.

However, in principle 'the worth of money' only comes into being when its values are shared collectively thus monetary value is not necessarily the only instrument to measure and explain value-as-capital. Zeithaml (1988) defined value as the 'consumer's overall assessment' based on their experience of using products or services in comparison to what they have given to acquire them. Woodruff (1997) proposes that a customer's perception is created based on an exchange between what is given in order to obtain something, and the values of this exchange which are often connected to product use. For example, in an exchange between a consumer and a shopkeeper

both parties have specific values to be offered and also expectations on what is to be gained. When both parties assume that their expectation can be met, the exchange occurs. The values to be offered for the exchange are considered part of their capital and these values do not necessarily have to include money but are instead based on mutual agreements on what is of value for each other. The barter system is an example of a mutual agreement to exchange that does not include money as part of the trade.

Value-as-Consensus

Value-as-consensus can be referred to experiences that are shared among people. Such values represent a network of social relations such as moral, ethics and symbolic meanings collectively shared within a group of people, for example, families, local communities, societies, clans, guilds, and government ministries (Graeber, 2001, p. 58). Value-as-consensus at times can contradict with value-as-capital as the latter focuses on personal and economic gain whereas the former can be associated with family values, religious movement, altruistic and philanthropic intentions or devotions to a cause (Friedman, 1996; Graeber, 2001, p. 257). This cluster of value offers meanings to objects that are not necessarily utilitarian but connected to certain symbolical aspects. These meanings signify shared values that are collectively accepted within a community, for instance, social status, prestige or luck (Boztepe, 2007). As an example, in Malaysia, it is common to find buildings without a fourth floor assigned to them. Instead, Level 4 of a building is often renamed as Level 3A (or other similar variants). This practice is due to the pronunciation of 'four' in the Chinese language which is similar to the word 'death.' This signifies bad luck and properties with this number are often avoided by the local Chinese communities⁵. Such symbolic perceptions need consensus and understanding within the community in order for it to make any sense. If the same practice is performed in a different community, for example, somewhere in the Netherlands, it would not have been appreciated as their collective values are essentially distinct. Thus, it can be stipulated that values-as-consensus represent shared values or collective agreements within a group of people. This type of values is also closely linked to the intangible cultural heritage.

Summary

This subsection highlights that human interactions are fundamental to the creation of values. These interactions occur between humans and other humans, humans and their artificial environments, and humans and the natural environment generating values that can be described as values that are personal (value-as-action), values that can be exchanged (value-as-capital), and values that are collectively shared (value-as-

⁵ An example based on the researcher's personal experience in her home country.

consensus). The third cluster is connected to values associated with the intangible cultural heritage. This discussion highlights the complexity of the concept of values which explains why it has been challenging to develop a central structure on the theory of values. To reduce this complexity, this research focuses on the concept of values in association with products in the following subsection. The discussion explores how values are created through satisfactory interactions with products.

4.3.3 Values, Products, and Satisfactions

Products in our surroundings influence the way we live, and these objects can shape and condition our body (Verbeek & Kockelkoren, 1998). Moment 1 and Moment 2 of the *Four Moments* highlight that products are created out of people's needs and wishes; offering various solutions for our everyday living (see 4.3.2). The process of selecting a product (or a service) is often influenced by a variety of factors such as family, social class, culture, and personal beliefs (Wang et al., 2016). These factors are linked to individuals' experiences as well as their social settings and surroundings.

Research on customers' experiences highlights the need for positive experiences. Such experiences can lead to loyalty which is paramount in sustaining products use and keeping companies' competitiveness (Wang et al., 2016). A satisfied customer can potentially become a loyal customer; hence, satisfaction is considered as the key to customers' loyalty (van Raaij, 2001, p. 169). Satisfaction is personal, anchored to specific experience, and linked to someone's interactions with a product or a service (Parasuraman et al., 1988; Sweeney & Soutar, 2001). As a result, customers' satisfaction influences the offerings available in the market affecting companies' decision in sustaining or scrapping a service or a product (van Raaij, 2001, p. 91). A satisfactory experience can potentially lead to repetitions which is much less likely after a bad or unsatisfactory experience. It is common that customers are the users themselves. Thus, loyal users can be considered as those who repeatedly experience a set of value offerings—either from a service or a product—over and over again. The act of repeating experiences is one of the critical concepts in this research as this action leads to the continuous use of a product and experiences that are shared with others contributing to its existence over time.

In 1988, Parasuraman, Zeithaml, and Berry presented SERVQUAL; one of the prominent scales to measure service quality or customer satisfaction (Wang et al., 2016). Initially, this method was developed due to the difficulty in evaluating service systems as they are built upon 'elusive and indistinct constructs' or, in other words, filled with intangibility (Parasuraman et al., 1985). Following the SERVQUAL formula (Parasuraman et al., 1988) consumers' acceptance is referred to their satisfaction; and satisfaction is evaluated based on the results of consumer's experiences that met his/her expectations. This precept is the origin of the term '*expected values*' and '*perceived values*.' '*Expected values*' relate to a consumer's evaluation and perceptions

before an exchange of service—or using a product—(van Raaij, 2001, p. 90). ‘*Perceived values*’ are associated with a consumer’s experience and evaluation after using a service—or product (van Raaij, 2001, p. 91). Satisfaction is created when perceived values meet the expected values (van Raaij, 2001, p. 91). These values are created based on experiences and evaluations which stemmed from the interaction, e.g. between a user and a product. It is personal, thus, specific to an individual’s perceptions and the situational context (Sanchez-Fernandez & Iniesta-Bonillo, 2007). From this theory, it is presumed that when ‘*expected value*’ is higher than ‘*perceived value*’ the interaction did not create a positive experience, therefore, lowering the chance of repetition. However, if the ‘*perceived value*’ is similar to the ‘*expected value*’ it is considered as a satisfactory interaction, hence, a better chance of repetition. Figure 4.6 illustrates this principle and presents the idea that a satisfactory interaction can lead to repeated actions.



Figure 4.6: The connection between ‘expected value’, ‘perceived value’, ‘satisfaction’, and ‘accepted value.’

A satisfactory interaction that leads to repetition is an important insight for this research. It highlights that due to repetition a particular pattern of experience can permeate into one’s daily life and eventually, become part of their habits, rituals, and culture. This immersion process leads to the creation of values that are closely knitted in one’s life and defined as ‘*accepted values*’ in this research. Over time—either consciously or unconsciously—such values are endorsed and shared with others and can be passed on to the following generation as well.

In summary, satisfactory interactions that are repeated and sustained over a period of time can be considered as an ‘*accepted value*.’ As they have been repeated (individually or collectively) these accepted values can easily be shared with others. When accepted values are confined based on one’s personal experience it is comparable to value-as-action; when such a value is endorsed and shared with others it is comparable to value-as-consensus. Every product has its own set of value offerings, and when the worth of these values is agreed upon such values offerings can be considered as value-as-exchange. This discussion leads to the definition presented in subsection 1.2.1 defining values in association with products as satisfactory interactions which are based on the evaluation between users’ expectations and their

experiences with a particular product. Such interactions can be shared, repeated (either individually or collectively,) and traded when their worth are agreed. When such a value is shared across generations, this research presumes that it becomes part of the intangible cultural heritage. As discussed in subsection 4.3.1, the intangible cultural heritage gives meaning to the tangible; however, it is abstract, susceptible to change, and difficult to manage. These characteristics are similar to the concept of values attributed to products which are elusive, complex and subject to change with time. These characteristics suggest the composition of values inherent in a product oscillates; hence, it is difficult to capture a holistic composition of values that are associated with a product. The following subsection delves into this topic further with the notion that the composition of values associated with products can be perceived as a set of interrelated elements.

4.3.4 Values of a Product: A Set of Interrelated Elements?

How to describe the composition of values inherent within a heritage product? As mentioned earlier, such compositions can be abstract, elusive, and susceptible to change. The interrelatedness of elements associated with a product can be considered as part of a complex system. Complexity is one of the main attributes of our world and attempting to understand these complex systems is not new to science (Huppertz, 2015; Simon, 1996, p. 181). A complex system as defined by Simon is a system “made up of a large number of parts that have many interactions (Simon, 1996, p. 184)”. His discussion highlights that:

- A complex system consists of a subsystem within a subsystem, and the relationships continue until we reach an elementary point—a point in which a subsystem that can no longer be decomposed into another subsystem.
- It can be viewed as a hierarchic structure which enables the subsystem to evolve (for example, an elementary point may evolve into a subsystem).
- The structure can be decomposed allowing the subsystems to be analyzed independently.

Simon observed that (1996, p. 184) “complexity frequently takes the form of hierarchy, and that hierarchic systems have some common properties independent of their specific content.” He emphasized that the term ‘hierarchic’ in this context does not follow the notion that a subsystem is beneath or has more authority over the other; instead, the system consists of a structure that presents broader relationships and the frequency or intensity of interactions among various subsystems. Three examples of such systems are (1996, pp. 186–188): 1) social systems, 2) biological and physical systems, and 3) symbolic systems.

This research proposes that understanding the hierarchical structure of the elements associated with products can present the means to describe the composition of values inherent within a heritage product. This suggests that values of a product can be

perceived as a set of interrelated elements that are independent of their individual content. In the following titles, this research explores: 1) the different types of values in association with products, and 2) the hierarchical structure of elements associated with products. These discussions provide the theoretical foundation for this research to describe the composition of values inherent within a heritage product.

Types of Value in Association with Products

Values do not exist in a linear format. As discussed by Williams and Soutar (2009) values need to be conceptualized as a multidimensional construct rather than unidimensional—for instance, when products are perceived only on their utilitarian values—or bi-dimensional—in which monetary value is included as one of the constructs in understanding values. The multidimensional construct as proposed by Williams and Soutar (2009) consists of a utilitarian aspect (includes functional value and value for money) and a socio-psychological aspect (comprises emotional value and novelty value). According to Boztepe (2007), the values perceived by users are closely connected to their overall experience of a product such as utility value, social related value, emotional values, and spiritual values. Parasuraman, Zeithaml, Berry (1985) provide three properties that contributed to values in relation to products as proposed by Nelson (1974) and Darby and Karni (1973); *search properties*, *experience properties*, and *credence properties*. *Search properties* relate to attributes that can be identified before using a product, for example, color, specification and sizes whereas *experience properties* are personal and only will be known after using a product, for example, the level of comfort and the product’s capability. *Credence properties* are related to characteristics that are only understood by experts but remain abstract from a user’s perspective. Table 4.2 presents a summary of the different types of values in association with products which have been discussed in this chapter and will be used as a reference in *Chapter 7: Analysis and Discovery*.

Types of Values	Explanation
Hedonic Values	Refer to the emotional aspects of an experience (Babin et al., 1994; Sanchez-Fernandez & Iniesta-Bonillo, 2007; Tasci, 2016). These experiences can be affiliated with socio-psychological aspects of a product, notably the emotional and novelty aspects of a product (Boztepe, 2007) which are personal and subjective (Babin et al., 1994; Sanchez-Fernandez & Iniesta-Bonillo, 2007; Tasci, 2016). Hedonic values can be associated with feelings, emotions and cognitive factors in experiencing a product.
Utilitarian Values	Refer to experiences that are functional, task-oriented, and rational (Babin et al., 1994). Utilitarian values relate to the functional aspects of a product which are only realized upon use or the “utilitarian consequences of a product” (Boztepe, 2007). This type of values is also related to ‘experience properties’ as discussed by Parasuraman, Zeithaml, and Berry (1985)

	which are personal and only known by an individual after using a product. For example, level of comfort and products' capability.
Visceral Values	Refer to the physical attributes of a product which are relatable to 'search properties' (Parasuraman et al., 1985). These attributes can be identified before using a product, for example, appearance, form, color, line, texture, and pattern details (Lin, 2007; Norman, 2013).
Credence Values	Based on 'credence properties' as discussed by Parasuraman, Zeithaml, and Berry (1985) which represent properties that are only known and understood by experts and often remain abstract from users' perspectives.
Symbolic Values	Refer to symbolic meanings that are collectively shared among families, local communities, and societies (Graeber, 2001). These values signify socially accepted beliefs that are not necessarily utilitarian or factual but are well-known and observed by a group of people, for example, social status, prestige or luck (Boztepe, 2007).
Community Values	Relate to the social aspects, for example, rituals and customs practiced at a community level (Boztepe, 2007; Graeber, 2001)
Family Values	Relate to the practices that are associated at a family level (Boztepe, 2007; Graeber, 2001)
Moral & Ethical Values	Refer to values that are collectively accepted as good (Graeber, 2013), for example, honorable principles, respectable actions, and admirable deeds. These values are connected to the social aspects of the users (Boztepe, 2007).

Table 4.2: Types of values and their explanations.

The different types of values listed in Table 4.2 demonstrate the multi-dimensional nature of values which can be associated with products. These values are not limited to current users as they expand beyond the lifetime of a physical product. Over time (and across generations), these values are ingrained into a particular type of product capable of stirring emotions as well as representing local identities. These compilations of experiences become part of the composition of values associated with a product. Graeber captures Annette Wiener's perspective that resonates to this insight:

“the value of objects of would simply be an effect of all the efforts people have made to maintain, protect and preserve them” (Graeber, 2001, p. 45).

However, how to describe the composition of values of a product in a structured manner? In the following title, this research explores elements associated with products based on design theories, specifically three design frameworks that illustrate the different sets of interrelated elements inherent within products.

Hierarchical Structure of Elements Associated with Products

If the composition values inherent within heritage products are considered as part of a complex system it can be assumed that such a composition comprises of a hierarchical structure that is independent of their individual content. Simon (1996, p. 207) highlights that a hierarchical structure enables “us to understand, describe, and ‘see’ such systems and their parts” and it also allows the decomposition of the subsystems that are inherent within a system. In order to explore and determine such a structure, this research examines three frameworks which have been developed to describe the different elements associated with products within the design field.

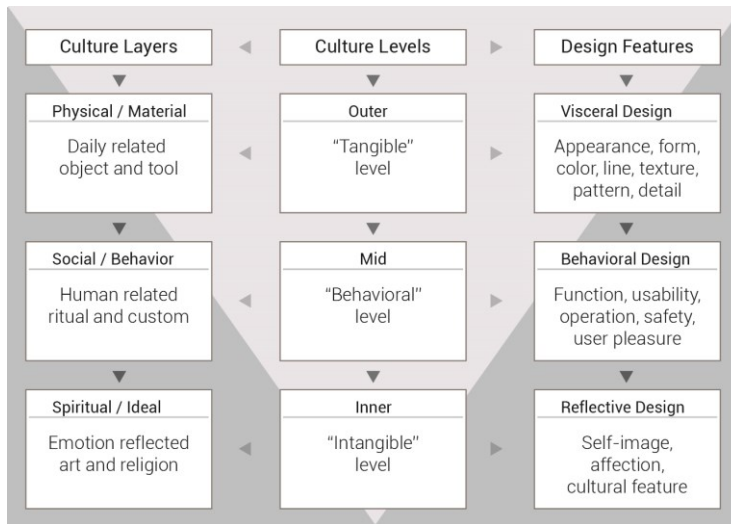


Figure 4.7: Framework for studying culture object by Lin (2007).

Figure 4.7 presents a design framework developed by Lin (2007) to explore elements related to cultural objects. The framework consists of three columns representing; *Culture Layers*, *Culture Levels*, and *Design Features*. The first column, *Culture Layers*, comprises of three different layers representing 1) physical or material culture, for example, sculptures and traditional objects, 2) social or behavioral culture, for instance, human relationships and social organizations, and 3) spiritual or ideal culture, for example, arts, rituals, and religions. The second column, *Culture Level* consists of the 1) ‘Outer’ or tangible level which relates to the physical attributes of a products, for example, color, texture, form, pattern, line and other physical details, 2) ‘Mid’ or behavioral level includes functions, operations, usability, safety, and 3) ‘Inner’ or the intangible level which relates to unique content such as stories, emotions, and cultural features. The third column, the *Design Features* originates from Don Norman’s perspective on three types of design features that stimulate human emotions; 1) visceral design which concerns the appearance of a product, 2) behavioral design relates to its use and functions, and 3) reflective design refers to the product in a specific context, for instance, individual’s experiences, educations and culture.

There are certain similarities between the elements used to study cultural objects by Lin (2007) and the types of values discussed in Table 4.2. These similarities are discussed at the end of this title. The framework also indicates a transition from collective values toward individual values. *Culture layers* relate to shared values, they are similar to value-as-consensus, while *design features* refer to direct and personal experiences between a product and its user, which is comparable to value-as-action. *Culture levels* consist of a mixture of these individual and collective values.

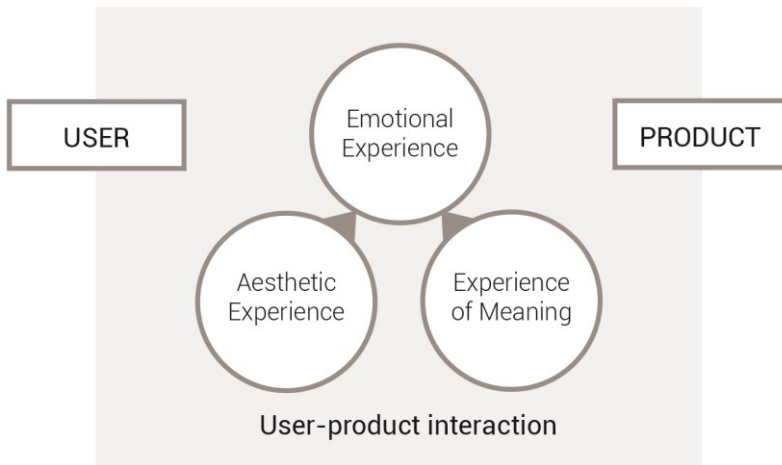


Figure 4.8: The framework of product experience (Desmet & Hekkert, 2007).

Figure 4.8 presents the second framework, Desmet and Hekkert’s (2007) product experience framework, which focuses on user-product interactions. Its development is rooted in the concept of human experience and aimed to explore the “complex and rich experiences people have while interacting with products” (Desmet & Hekkert, 2007). Interactions are fundamental to the creation of values (see 4.3.2). The framework presents three types of user-product experience: 1) *Aesthetic Experience*—relates to the extent in which human senses are affected, 2) *Experience of Meaning*—involves a cognitive process that associates meanings with a product, and 3) *Emotional Experience*—the sum of interactions that evoke feelings and emotional reactions. Contrary to Lin’s framework which focuses on the objects, this framework focuses on the user’s emotional experience while interacting with a product.

The third framework is one of the models used in the strategy stage of the ‘Brand-Driven Innovation Method’ by Roscam-Abbing (2010). The ‘Design Layers’ model offers the means to explore different product touchpoints that need to be taken into account in a design process. The term ‘touchpoint’ in this model is a general term used to represent various design adaptations, for example, in the context of product design, communication design, or service design. As shown in Figure 4.9, the model consists of five layers of meaningful interactions which can be used to probe different touchpoints associated with products, users, services, and organizations (Roscam-

Abbing, 2010, p. 154). In its application, this model is considered as an onion model where each layer needs to be peeled off one at a time (p. 154).

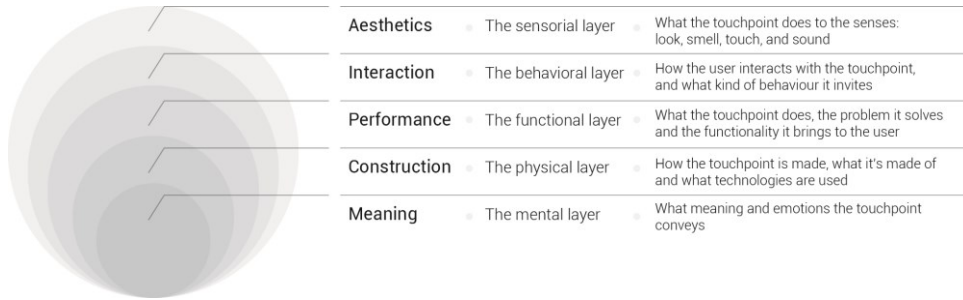


Figure 4.9: The Design Layers (Roscam-Abbing, 2010).

The first layer, *Aesthetic* refers to the human sensorial experiences, for example, sight, smell, and touch. The second layer, *Interaction*, concerns human behavior or user interactions with the touchpoints. The third layer, *Performance*, relates to the functional aspects of the touchpoints, for example, the solutions offered by a product to its users. The fourth layer, *Construction*, refers to the methods used to produce or manufacture a touchpoint. Finally, the fifth layer, *Meaning*, concerns the mental layer which relates to the meaning and emotions created during the interactions.

These three frameworks illustrate the different structures in which elements associated with products are constructed. Lin's framework is developed as a lens to explore various culture features inherent within traditional objects. The 'User Experience' framework is developed as a lens to observe human/user's emotions in their interactions with products while the 'Design Layer' model is used as a framework to identify different touchpoints in the development and life-cycle of a design. Table 4.3 presents the summary of the different elements associated with products covered by these frameworks.

As shown in the table below, this research presents a set of interrelated elements that can be associated with products—the product elements. The basic structure of these elements is adopted from the 'Design Layers' model as it covered the various aspects related to products from their developments, uses, end-of-life, as well as metaphysical aspects. Furthermore, the 'Design Layer' is the only framework that includes the process of making a product as one of the elements. This particular layer is comparable to credence values and also constitutes an important aspect within the craft domain. Table 4.3 exhibits the link between the five components of product elements and the types of values listed in Table 4.2. Based on these findings, this research adopts the five layers of product elements as the foundation to explore values inherent within a heritage product.

cultural layers	cultural levels	design features	user experience	design layers	product elements	types of values
Physical / Material	Outer/Tangible	Visceral Design	Aesthetic Experience	Aesthetic layer	Physical outlook of a product	Visceral Values
Social / Behavior	Mid / Behavioral	Behavioral Design		Interaction layer	Behaviors and interactions between products and people	Utilitarian Values Hedonic Values
	Mid / Behavioral			Performance layer	Functions and offerings of a product	Utilitarian Values
				Construction layer	Process of making a product	Credence Values
Spiritual / Ideal	Inner / Intangible	Reflective Design	Experience of meaning Emotional experience	Meaning layer	The metaphysical aspects related to a product	Symbolic Values Community Values Family Values Hedonic Values Moral & Ethical Values

Table 4.3: The synthesis on the different aspects related to the frameworks.

Summary

This subsection presents the theoretical understanding of the composition of values in association with products. The discussion highlights that the composition is considered as a set of interrelated elements with various interactions and can be perceived as a hierarchical structure. This understanding supports the process of understanding, describing, and decomposing the sub-systems into a set of interrelated elements. Next to this, as part of a hierarchical structure, each element can be analyzed independently, and their changes and evolution can be observed. This research also listed eight types of values associated with products and explored three design frameworks to describe a set of interrelated elements in products. These two theoretical perspectives are used as a reference to understand, describe, and decompose values in association with products. This research adopted one of the frameworks—the Design Layers—as the basis to develop a model to be used as a lens for exploring values attributed to heritage products. This framework will be refined to meet the need for the research to explore values inherent within heritage products. The development of the model is presented in *Chapter 5: Design Intervention: Tools and Procedure*. Next to this, the types of values listed in Table 4.2 will be used as the theoretical reference in analyzing the empirical data collected from the field in *Chapter 7: Analysis and Discovery*.

4.3.5 Conclusion

This section presents the theoretical exploration conducted based on **P2** where the research explores the concept of values in association with products. Figure 4.10 illustrates the overview of this exploration by visualizing heritage products in connection to the tangible and intangible cultural heritage, the concept of values, and the composition of values as a hierarchical structure. These products are part of the local cultural heritage with values that have been attributed to products over time and across generations. These values are recognized and shared by the society. At a fundamental level, values are created through human interactions; these interactions occurred between people, their artificial surroundings, and the natural environment. This research identifies that they can be clustered as value-as-action, value-as-capital, and value-as-consensus.

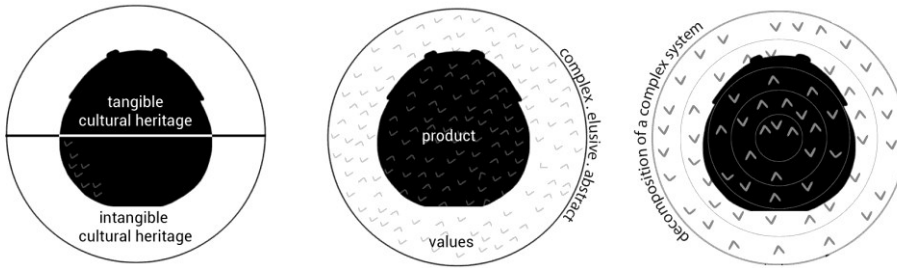


Figure 4.10: Exploring values inherent within a heritage product.

In principle, values in association with products are created based on the evaluation between what is expected (expected values) and what has been experienced (perceived values), and satisfaction is created when perceived value meets expected value. Satisfactory interactions that have been repeated and sustained over time are considered ‘accepted values.’ This research perceived that the experiences shared by local people about their heritage products as ‘accepted values.’ However, the composition of values in association with products is abstract, elusive, and susceptible to change. By assuming that the composition of these values is part of a hierarchical structure, this research proposes that the composition of values in association with products can be understood, described, and decomposed into a set of interrelated elements identified as five layers of product interactions: Aesthetic, Interaction, Performance, Construction, and Meaning layers. The research also identified and listed eight different types of values that demonstrate the multi-dimensional construct of values that are associated with products.

This research intends to examine these theoretical findings against the data collected in the empirical exploration. According to Boztepe (2007), studies related to values are often conceptual in nature; therefore, an empirical exploration is critical to understanding the dynamic of values further, its characteristics and properties. Following these theoretical findings, this research revisited **P2** and refined its content as shown below. The highlighted content in the proposition presents the part which has been refined based on the findings discussed in this section.

Proposition 2

Values are attributed to products; this research proposes that these values are a set of interrelated elements that is shared over time and across generations; and between craft and design domains.

Proposition 2a

The composition of values attributed to a heritage product can be understood, described, and nearly decomposed according to a set of

interrelated elements that comprises of aesthetic layer, interaction layer, performance layer, construction layer, and meaning layer.

Next, this research presents the second part of this chapter which discusses the practicality of exploring the values of heritage products. As mentioned in subsection 1.2.2, two areas of application have been identified where values of heritage products can be useful:

- The adaptation of values of heritage products in the product development process
- Eliciting the elements of sustainability within the values of heritage product.

Part 2

Areas of Application for Values of Heritage Products

4.4 Part 2: Introduction

This second part is also divided into two sections (4.5 and 4.6) in line with **P3** and **P4** (shown below) which will be refined based on this theoretical exploration. Section 4.5 presents the area of application where values of heritage products are adapted as one of the creative inputs in the product development process. Within this context, this research examines current practices of professional designers and design researchers on the adaptation of culture-oriented content in contemporary products. Through this discussion, this research intends to find factors that influence and drive such adaptation. Section 4.6 discusses another area of applications for values of heritage products: as a resource to elicit elements of sustainability of the past. The exploration begins with the present context of sustainability followed by the exploration on elements of sustainability that are associated with products, such as, their development process, usage or end-of-life. By the end of this section, the research presents a framework of elements of sustainability associated with products. This framework will be used as an indicator to screen the values of heritage products. Both sections end with a conclusion and a refinement of the propositions.

Proposition 3

Applying the values of heritage products in the early stage of the new product development process promotes an inclusive and conscious adaptation of cultural related content in new design ideas.

Proposition 4

Heritage products comprise of interactions from the past which can be useful in modern day sustainable initiatives, this research proposes that contemporary standards on sustainability—especially those established in the design field—can be used as indicators to identify and elicit these interactions.

4.5 Adapting Culture-Oriented Content in the Design Process

Within the context of the cultural heritage, preservation and innovation need to co-exist. If preservation is our only concern heritage loses its vitality, and innovation with no sense of preservation may lead to generations without connections to their roots (Paškvan, 2008). In his book *‘Onward: How Starbucks Fought for Its Life without Losing Its Soul’*, Howard Schulz wrote about the company’s efforts in sustaining their business: “we need to return to our roots, but if that heritage was not linked to a willingness to reinvent and innovate, then we would fail (2011, p. 55).” This example demonstrates an approach of translating elements of the past into a direction that is relevant and receptive to the current situations. In subsection 1.2.2, this research highlights Kenya Hara’s view on probing elements of cultural heritage in the design process as resources to drive future developments. These design approaches echo a statement by a former Director-General of UNESCO:

“Intangible cultural heritage is not just the memory of the past culture but also a laboratory for inventing the future” (Koichiro Matsuura, former Director-General of UNESCO, 2002)

This section presents the first area of application in which the research explores the adaptation of culture-oriented content in the product development process, specifically the design process.

The discussion begins with examples of contemporary products embedded with culture-oriented content. Then, the research explores existing practices by design professional and design researcher of interpolating these elements in the design process. The discussion continues with how to promote inclusive and conscious adaptation of culture-oriented content in the design process. The result of this exploration highlights the importance of 1) local stakeholders’ participation, and 2) a structured approach in adapting of such content in the product development process. The section ends with a conclusion and a refinement of **P3**.

Additional note: in this section, this research uses the term culture-oriented content to represent the elements of cultural heritage adapted in the design process. This choice is made due to the various terms and definitions found in literature which includes

traditions, heritage, cultural heritage, cultural artifacts, cultural elements, and local features.

4.5.1 Adaptation of culture-oriented content in contemporary products

The adaptation of culture-oriented content in the design domain can be observed in research as well as in practice. Figure 4.11 shows examples of three contemporary products designed with this principle. The first product is the designed by Midori Mitsui in 2005. This particular chair was inspired by the wooden and bamboo structures that have been part of Japanese architecture for centuries; it is also designed in response to the need for proper ventilation in the hot and humid summers in Japan (Hagiwara & Price, 2006, p. 18). The second picture (bottom left) exhibits chairs and table from the *'In Between'* collection by a Danish company, &tradition. Established in 2010, the company collaborates with various studios and designers for their collections with a focus on the connection between traditions and innovation. This particular collection is part of their collaboration with Sammi Kallio, a Finnish designer based in Sweden. The collection highlights the traditional art of woodturning and the designer's affection for Scandinavian heritage (&tradition, 2014). The third picture (bottom right) shows one of the products from the *'Geweih'* or collection exhibited in the in Stuttgart (Albus et al., 2011). This collection is inspired by the tradition of mounting animal heads (or taxidermy) on the wall as part of interior decorations. These three examples provide a glimpse of how designers interpolate elements of cultural heritage in their creations.

Products embedded with culture-oriented content offer differentiation in an increasingly globalized market (Lin, 2007; Moalosi et al., 2007; Tung, 2012). In the design domain, the adaptation of elements of cultural heritage in contemporary products is not something new. It is a familiar practice with certain benefits to the end products. As mentioned in subsection 1.2.2, such adaptations improve product's identity, influence marketing strategy, and enhance customer experience. Furthermore, these products are often considered as 'socially acceptable products' (Moalosi et al., 2007) as they comprise of familiar characteristics that are in accordance with local nuances and distinct regional needs (Luo & Dong, 2017).

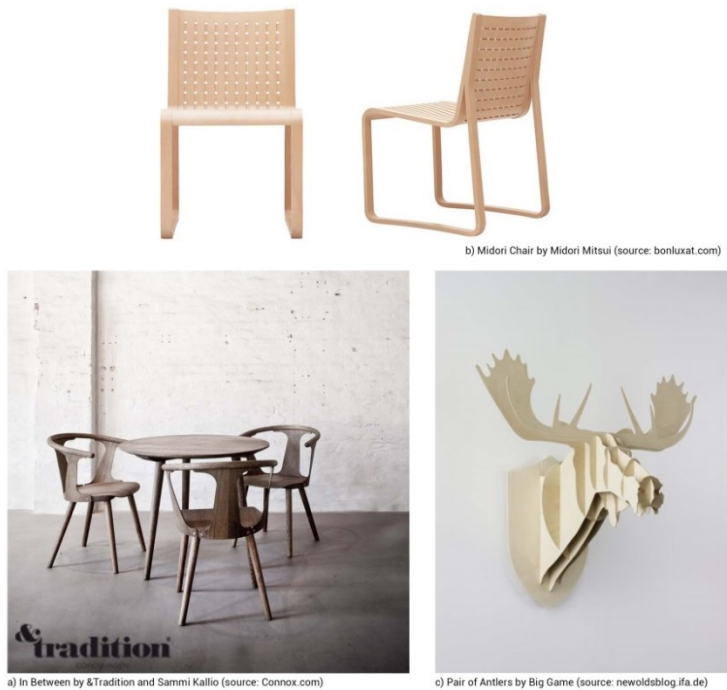


Figure 4.11: Contemporary products embedded with traditional / cultural-oriented content.

Approaches by Design Professionals and Researchers

The conversation between Renee Ramakers and Volker Albus (Albus et al., 2011, p. 25) pointed out the significance of capturing the elements of everyday in the design process—things that are subtle yet bring comfort. The conversation highlights one of the practices in Droog⁶ studio is “to rework traditional elements, to transform traditional elements into contemporary design.” Apart from capturing the mundane elements of everyday, two well-known Japanese designers also focus their attention on traditional objects and practices. Naoto Fukusawa mentioned that a truly good design should be anonymous as it dissolves into the behavior (Kilcrease, 2015). This principle advocated by Fukusawa is known as anonymous design and is similar to the principle behind the creations of folkcraft (see 4.2.1) which refers to products that are created out of necessities. For Kenya Hara, historical objects and actions rooted in Japanese

⁶ Droog is a conceptual Dutch design company founded by Renny Ramakers and Gijs Bakker in 1993. Located in Amsterdam, Droog has worked in various design projects and collaborated with independent designers, for example, Hella Jongerious and Marcel Wanders.

traditions are part of his of inspiration providing an alternative lens in designing, producing, and also living.

Figure 4.12 presents the procedure of four design approaches which interpolate culture-oriented content in their design process. These approaches are selected for different reasons. The first approach is by &tradition. This Danish company is one of the companies who openly share their approach in adapting culture-oriented content as part of their marketing content. The second and the third approach, by Lin (2007) and Tung (2012) are two of the main approaches that influence the development of this research and have been cited by other researchers studying the means and methods of the process of generating ‘culturally-oriented products’ (Luo & Dong, 2017). Finally, the fourth approach by Reubens (2010) is an approach that has been developed internally within the Design for Sustainability Program in TU Delft. These examples provide a basic understanding for this research to establish an overview of existing approaches that include culture-oriented content in the design process. Detailed explanations about each approach can be found in Appendix 1. Table 4.4 shows five relevant factors concerning the adaptation of such content in the design process based on these four design approaches.

Table 4.4 highlights the use of heritage products (or cultural objects) as a source of inspiration in Lin’s approach and as a source of information in Reubens’ approach. In Lin’s approach knowledge associated with heritage product is assimilated during the design process while in Reubens’ approach the knowledge associated with heritage products is independent of the design process. This means that the database associated with these products serves as a form cultural repository which can be used for other applications. Using heritage products as a source of reference and adopting the knowledge associated with it as a creative input in the design process is an ideal solution for this research. Through this approach, this research identifies the opportunity to build a database about a selected heritage product. As proposed by Reubens such a data can be perceived as a cultural repository, a form of cultural capital for the local community. However, the method of building a database according to Reubens’ approach is not feasible in this research as it requires the production of a complete range of traditional products by craftspeople while designers are responsible for the documentation. Such an approach needs a lot of resources in its initiation, especially from the local craftspeople.

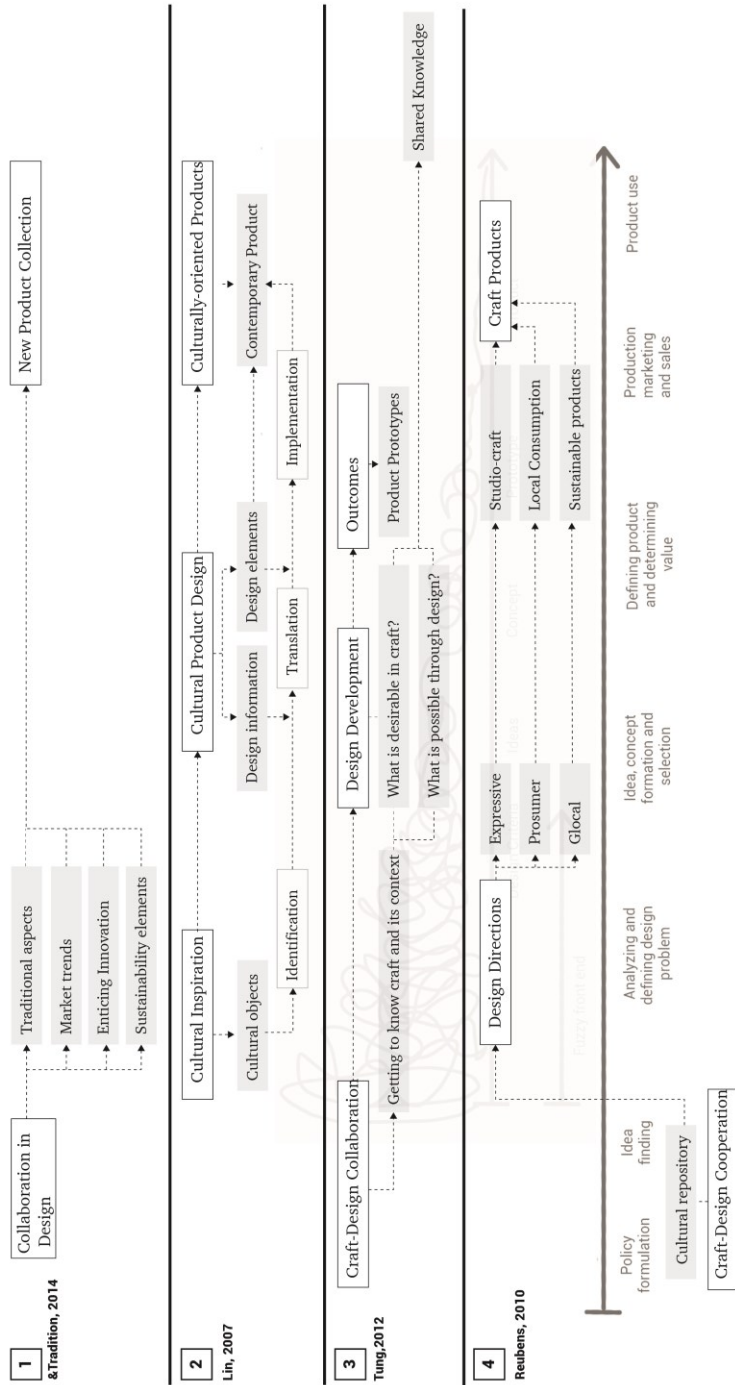


Figure 4.12: Overview of design approaches in adapting culture-oriented content in the design process.

Relevant Factors	1 &tradition (2014)	2 Lin (2007)	3 Tung (2012)	4 Reubens (2010)
1. The use of heritage products (or cultural objects) as a source of inspiration.		✓		
2. The use of heritage products (or cultural objects) as a source of reference.				✓
3. Include collaboration efforts	✓		✓	✓
4. Include craft-design collaborative efforts			✓	✓
5. Include other relevant of creative inputs	✓			✓

Table 4.4: Relevant factors in the adaptation of culture-oriented content in the design process.

Next to this, the third and the fourth factor highlight the significance of collaboration efforts in interpolating cultural resources in the design process. From the table, it can be seen that &tradition's approach involved a collaborative effort between a company and designers in the process while, Tung's and Reubens' approaches focus specifically on collaborative efforts between craftspeople and designers. Finally, the last factor indicates that apart from the use of culture-oriented content other relevant creative inputs are also included in the process. For instances, &tradition's approach includes creative inputs such as market trends, users' sentiments, and sustainable elements while Reubens' incorporated three potential market directions in the development of craft products. Based on these factors, this research identifies that in adapting such content in the product development process, it should take into consideration:

- The collaborative efforts between craft and design domains. This insight corroborates with the initiation of this research which focuses on the need and opportunity for the exchange of knowledge between the craft and the design domains.
- Heritage products as a source of reference. A deliberate approach to include knowledge associated with of heritage products as a creative input in the product development process. Also, this demonstrates the use of heritage products as an epistemic object or an object of inquiry.
- The importance of including other creative inputs, for example, market trends, and consumer needs in the development of the design workshop. (The design workshop has been introduced in subsection 3.2.2 and will be discussed in detail in Chapter 5).

4.5.2 Inclusive and Conscious Adaptation

Similar to other creative inputs such as nature, users, and materials the cultural heritage also offers tremendous resources as a creative input in the design process. However, due to contemporary demands in the product development process priority often falls on factors such as consumers' needs, users' lifestyle, brands and corporate identities, market trends as well as buyers' demands. Less attention is given to elements from the local cultural heritage that are adapted in contemporary products

and more often than not their contributions in the design process are unintentionally overlooked and, at times, ignored (Hagiwara & Price, 2006). Although awareness of the influence of cultural heritage elements in the design process is growing among design professionals and design researchers, these elements are still latent and invisible in the final products.

As the craft industry is slowly transforming into standardized industrial practices, the social and cultural influence of its outcomes tends to be undermined (Banks, 2010). Even though craft work remains a vital and necessary element within the industry their contributions in the process are often masked by the ostensibly creative process (Banks, 2010). This separation is compounded by the division of labor where craft works are mainly conducted in the developing countries and the creative works in the developed countries (UNESCO, 2013). Therefore, although knowledge within the craft domain has contributed to the development of the industry (see also 1.1.1 and 4.2.1), their offerings are often perceived as subordinate to creative (or artistic) works (Banks, 2010). This discussion highlights the need for identifying the means for craft and design domains to be equally involved in the design process. Equal, in this context, does not necessarily mean the amount of work or time are divided equally but as proposed by Reese (1997) each domain is conscious of their contributions in the process according to their fields of expertise, and neither party should have a moral advantage nor creative liberty over the other.

In subsection 2.1.3, this research highlights the importance of inclusive approaches in creative activities to provide equitable means for local stakeholders to make efficient use of their cultural resources. One of the means to do this is to ensure participation of local stakeholders in the early stage of the design process in which their knowledge and expertise are respected and adopted in effective and meaningful ways. Section 4.2 discussed the need to and opportunity of bringing craft and design domains together. Through this area of application, this research aims to nurture an inclusive exchange where knowledge and perspectives from both domains are appreciated, respected and utilized in the product development process.

Inspirational Stimuli in the Fuzzy Front End

This thesis has introduced the different phases in the product development process in subsection 1.1.1. The fuzzy front end is an important phase in shaping the direction for any development process; however, its process can be chaotic and ambiguous (Tung, 2012). During this phase, designers delve into various directions to find answers, ideas, insights, and opportunities (Sanders, 2005). According to Goncalves, Cardoso, Badke-Schaub (2014) “searching for inspirational stimuli is one of the essential steps” in this phase and it can be either active or passive. An active approach signifies a conscious and structured method in acquiring information whereas a passive approach represents a more random and intuitive approach in gathering information.

Various inspirational stimuli are used in the fuzzy front end to support the design process, such as products, buildings, pictures, artwork, documents as well as other life forms from nature (Gonçalves et al., 2014). One of the challenges often faced by designers is selecting an inspirational stimulus among the different resources available (Gonçalves et al., 2014). Although these stimuli come in different forms, they share four main characteristics: accessibility, availability, applicability and authenticity (Gonçalves, 2016, p. 56). These characteristics highlight the explicit nature of an inspirational stimulus. Currently, there is no established taxonomy that provides an overview of the different types of inspirational stimuli adopted or favored by designers. However, Gonçalves (2016, p. 211) identifies three forms of inspirational stimuli: visual, object, and textual. According to her survey, objects are considered highly important by professional designers whereas design students considered objects as moderately important.

Objects are a common source of inspiration for designers (Gonçalves et al., 2014). Hagiwara & Price (2006, p. 8) mention that when tradition is used as an inspirational stimulus, the source often originates from objects, habits, rituals, customs, and daily activities as well as the surroundings. They further highlight that one of the challenges in using traditional objects as an inspirational stimulus is that the new designs need to exude a certain feeling based on the original object yet the translation cannot be too obvious or literal as it will turn into an imitation instead (Hagiwara & Price, 2006, p. 8).

Luo and Dong (2017) conducted a study in which two types of stimuli based on a heritage product (or ancient cultural artifact) are used in the idea generation phase. The first stimulus is based on textual information of a selected heritage product and the second stimulus is its visual representation. The results based on a short design task indicate that textual stimulus leads to a higher level of product originality and practical design outcomes in comparison to those generated based on the visual representation. This result highlights the benefits of in-depth knowledge related to a cultural product in generating new product ideas and contributing to the originality and practicality of the concepts. The study also advocates the importance of a mechanism that supports designers (as well as design students) to seek and explore the knowledge about heritage products from various sources, especially from experts in cultural heritage studies. These experts can be master craftsmen, anthropologists, historians as well as local craftspeople.

Currently, there are no clear regulations or mechanisms that require designers to identify their source of reference or inspiration, however, recognizing and crediting the source where it is due can be considered as an ethical practice for the profession. This practice can be done more easily if designers are conscious of the different elements that are included in the design process. This research envisions an opportunity for designers to be a proponent, an agent involved in safeguarding values of cultural

heritage, if they can consciously adapt elements of cultural heritage in new designs and establish a platform for the users to learn more about the connections between the elements of cultural heritage in contemporary products. In a way, conscious adaptation also provides a platform for the voice of inheritors or “carriers of local cultural heritage to be heard—literally and metaphorically (Galla, 2008).”

4.5.3 Conclusion

This section presents the theoretical exploration conducted based on **P3** where the research focuses on the first area of application for values of heritage products: as one of the creative inputs in the fuzzy front end of the product development process. Figure 4.13 illustrates the connection between culture-oriented content, elements of cultural heritage, and values of heritage products and where these values can be incorporated in the product development process.

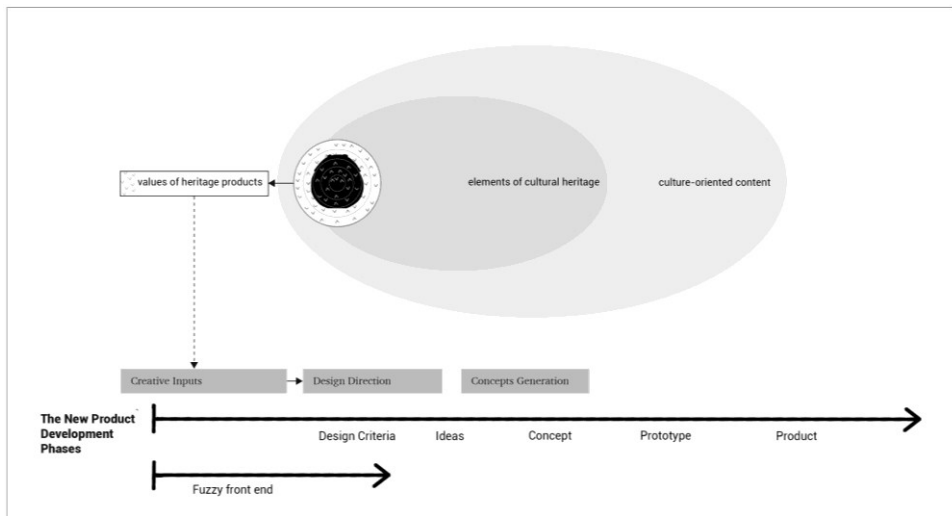


Figure 4.13: The adaptation of values of heritage products in the product development process.

In order to consciously adapt elements of cultural heritage as a source of creative input in the product development process, this research explores examples of products embedded with elements of cultural heritage and approaches by design professionals and design researchers in adapting culture-oriented content the design process. From this discussion, this research identifies three aspects from the theory that are relevant to the development of the empirical exploration:

- The adaptation of cultural content as a creative input in the design process;
- Knowledge sharing and repository building through collaborative efforts;

- The inclusion of other creative inputs such as market trends and user insights in developing contemporary products embedded with culture-oriented content.

The discussion also highlights the importance of inclusive and conscious adaptations of culture-oriented content in new design ideas. Inclusive adaptation refers to the need to create equitable means for local stakeholders from craft and design domains to collaborate; in which their perspectives are appreciated, respected, and recognized in the product development process. Conscious adaptation refers to the capacity to discern the link between elements of cultural heritage which have been adopted in contemporary products. In this sense, an inclusive and conscious adaptation can potentially offer a means to recognize, appreciate, and safeguard elements of cultural heritage in new design ideas. To operationalize these theoretical findings, this research adopted an active process in searching for inspiration stimuli in which heritage products are deliberately included as one of the creative inputs in the product development process. This research adopts the characteristics of inspirational stimuli: accessibility, availability, applicability, and authenticity as part of the criteria in selecting heritage products in the field (see 5.2.1).

Theoretical findings also highlight the need for a structured approach that supports designers (as well design students) in seeking and exploring knowledge about heritage products through collaborative efforts with local craft stakeholders whilst ensuring an inclusive and conscious adaptation of culture-oriented content in the product development process. This research revisited **P3** and refined a segment of the proposition (highlighted in grey) based on the discussion in this section.

Proposition 3

Applying the values of heritage products as a creative resource in the early stage of the new product development process promotes an inclusive and conscious adaptation of cultural related content in new design ideas.

Proposition 3a

Values of heritage products can be used as a creative resource via a structured approach that includes the participation of local craft stakeholders and the deliberate inclusion of heritage products as an input in the fuzzy front end of the product development process. The approach promotes an inclusive and conscious adaptation of culture-oriented content in new design ideas.

In brief, to incorporate values of heritage products in the product development process, this research focuses on a structured approach that includes 1) the participation of local craft stakeholders and 2) the use of heritage products as a

creative input in the fuzzy front end phase of the product development process. These findings are used to guide the development of the design workshop (see 3.2.2 and 5.1). The development of the design workshop focuses on a structured approach that includes:

- The participation of local craft and design stakeholders;
- The deliberate adaption of heritage products as a creative input in the product development process.
- The inclusion of other relevant creative inputs in the design process.

Next, the research presents the second area of application where values of heritage products are considered as a meaningful resource: to identify and elicit sustainability practices of the past.

4.6 Elements of Sustainability of the Present and the Past

Sustainability is not a new research area within the design field. However, this subject is still an emerging research territory within cultural heritage studies, both from theoretical and empirical perspectives (Boccardi & Duvelle, 2013; Loulanski & Loulanski, 2016). Both research areas can be characterized as dynamic, complex, and multi-faceted (Loulanski & Loulanski, 2016).

On the one hand, the cultural heritage is associated with the stock of cultural capital that has been inherited from previous generations and handed onto the next generations (Throsby, 2008). The cultural heritage retains its significance through interactions with the society (see 4.3.1) and these intergenerational interactions generated complex relationships between people, their artificial goods, and natural surroundings. On the other hand, sustainability can be defined as “the possibility that human and other life will flourish on earth forever (Ehrenfeld, 2008, p. 49)”. Another definition, more commonly quoted, is the Brundtland Commission (1987) underlining sustainability as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs (p.43)”. In essence, both research areas are invested in intergenerational equity, i.e. safeguarding and sustaining for future generations. Although their perspectives of what to safeguard or sustain are fundamentally distinct, their shared interest in intergenerational equity should not be disregarded.

In this section, this research discusses a possibility of bringing these two research areas closer through the use of heritage products as a medium (or a resource) to identify and elicit elements of sustainability of the past. During the time when prosperity was low, people needed products that are easy to make, maintain, and sustain. Besides, products that have lasted so long should be sustainable in some way, and it would

beneficial to be able to learn and integrate these aspects in the present and future living.

The discussion begins with the current perspectives and theories related to sustainability. Then, it focuses on establishing a concept of sustainability that can be used as a lens to observe elements of sustainability in the past, the present, and the future. Next, the exploration concentrates on the elements of sustainability that are associated with products and their development process. Through this exploration, this research develops a framework of the different elements associated with products that are perceived as sustainable. This framework is used as a reference in *Chapter 7: Analysis and Discovery* to identify and elicit elements of sustainability among the values of heritage products collected during the empirical exploration. In this exploration, this research perceived that there are elements of sustainability that influence the existence of a product across generations which can also be useful for modern-day's sustainable initiatives.

4.6.1 The Present Context of Sustainability

In subsection 1.2.2, this research mentioned that the lifestyle of previous generations was hard and precarious, but it also instills a sustainable way of living. The challenging life settings of the past drive people to adopt practices that are, now, deemed as sustainable. Similar to biomimicry which analyzes nature's creative solutions and adapts them for human applications (Benyus, 1997), this research aims to analyze values of heritage products that can be used to instigate sustainable way of living.

It is common knowledge that the unsustainability situation we face today is the result of our modern practices (Ehrenfeld, 2008, p. 7) and they are partly rooted in our daily activities and patterns of consumptions (Holt, 2012; Thøgersen, 2013). The culture of consumption plays a major role in the contemporary society; it is bigger than what we have experienced in the past (Ritzer, 1999, p. 178) and at capacity more than our 'mother earth' can supply (Ehrenfeld & Hoffman, 2013, p. 73). In essence, demands for entertainment and superfluous things increase when our basic needs are satisfied (Ritzer, 1999, p. 196). This phenomenon resonates with the descriptions of Moment 1 and Moment 2 (see 4.3.2) which stated that the act of producing for human needs will always create new needs.

Our modern consumptions are a well-known culprit because [most of the time] they are no longer driven by sustenance but instead by possessions as a mark of status (Ritzer, 1999, p. 207). Unfortunately, a worldview that glorified consumption for status is still prevalent today.

"I'd rather cry in the back of a BMW than smile on a bicycle"

The statement above made by a Chinese blogger provided an example of such a view (Wetherhold, 2012); a view that also comes with social and environmental costs. When a status is part of a decision in acquiring products one's decision is often focused on emulating the status just above one's current means (Ritzer, 1999, pp. 207–208). This means that such a person does not only acquire a product that he or she does not need but also cannot afford. Next to this, there are also those who can acquire any types of goods but make a conscious decision to get only the things that have meaning and bring certain fulfillment in their life (Ritzer, 1999, p. 196). This relates to a worldview 'consumption is no longer virtue' indicating that excessively acquiring goods does not necessarily lead to a fulfilling life (Hagiwara & Price, 2006, p. 7). The different perspectives and motivations for consumption demonstrate the importance of understanding what we value as it would eventually influence the way we consume.

The majority of the world populations are growing rapidly in the emerging countries such as Vietnam, China, and India; however, their current model of a satisfying life is based on the culture of consumption which has been proven to be unsustainable. Would it be possible for emerging countries to leapfrog, to evolve differently from the western world (Ehrenfeld & Hoffman, 2013, p. 71)? This research proposes that one of the means to break away from the current unsustainable conditions is to identify, elicit, and nurture existing practices that instill and promote sustainability.

“Sustainability demands that the people of the world stop consuming in the way that we do today” (Ehrenfeld & Hoffman, 2013, p. 68)

The way we choose to live our lives and our routine behaviors are part of the construction of our culture (Ehrenfeld & Hoffman, 2013, p. 77). Changing this construction is a challenge as we need to be conscious of the choices we make especially when they are part of the 'unsustainable patterns of addictions' (Ehrenfeld & Hoffman, 2013, p. 43). Although difficult, such awareness might lead to healthier patterns of consumptions (Ehrenfeld & Hoffman, 2013, p. 124). Our daily habits can become the foundation of living successfully or living with pathologies as well as inefficiency and when these actions are repeated over a period of time, ultimately, they become the fundamental elements in the construction of our culture (Ehrenfeld, 2008, p. 43). These fundamental elements can be linked to the concept of 'accepted values' which refers to satisfactory interactions that are repeated and sustained over time (see 4.3.3).

Although we live in a modern world, values from the past still permeate our every day; for example, values that often led people to grow, fix and mend their possessions. If age-old ideas can help to cultivate practices toward a sustainable society, there is no reason not to restore or reclaim them into our everyday life (Ehrenfeld & Hoffman, 2013, p. 105). As highlighted by Luo & Dong (2016), elements of culture echo local

nuances and comprise of familiar values that can easily be accepted and practiced among local communities. Furthermore, strengthening sustainable practices rooted locally allows them to appreciate the practices inherited from the previous generation and indirectly become a trigger to safeguard traditional practices for the future.

The Concept of Sustainability

Although there is a broad discussion about sustainability, there are no definitions that allow an understanding "concerning sustainability from the recent past until the presents (Faber et al., 2005)"(see also 1.2.2). Their study identifies that existing definitions are "ill-defined, incomplete and often contradictory." The paper presents a framework which highlights three aspects related to the definitions of sustainability:

- *Artifact* refers to what is to be sustained.
- *Goal-orientation* refers to the change or adjustment and this process can be related to an ideal state or an initial state.
- *Behavior-interaction* refers to the exchanges between an artifact (what is to be sustained) and its surroundings.

They further state that “sustainability no longer targets an ultimate sustainable state, but instead becomes a process of constant improvements of the sustainability of artifacts (Faber et al., 2005).” The study establishes that sustainability is not an achievable goal (or a state), but rather a continuous process and constant efforts of improving the current state of the world.

As mentioned in subsection 1.2.2, this research initiates its understanding of the concept of sustainability based on the ‘three pillars of sustainability’: people, environment, and economy (Brundtland, 1987; Elkington, 1998; McKeown, 2006) also known as ‘the Triple Bottom Line’ (Elkington, 1998; P. Van Der Lugt, 2008, p. 7). The first pillar, ‘People’ or commonly referred to as the social aspect of sustainability (P. Van Der Lugt, 2008) concerns the vitality of the social network that allows community as well as individuals to interact with each other in order to meet their needs or shared objectives (Reubens, 2016, p. 56). The second pillar, ‘Environment’ relates to the ecological aspects of our natural environment. Ecological components comprise of the atmosphere (air), hydrosphere (water), lithosphere (land), and biosphere (living things) (Reubens, 2016, p. 55) which provide resources as well as receive excess (or waste) from people and their artificial environment. The third pillar ‘Economy’ relates to the concept of exploiting different types of resources—for example, ecological, social, and cultural—to generate income (Reubens, 2016, p. 57). The concept of economy is one of the primary drivers in sustainable development especially in the context of developing countries (Jansen & Crul, 2012; Reubens, 2016). These three

pillars or dimensions of sustainability—ecological, social, and economic—are the most common representation in the sustainability discourse (Reubens, 2016, p. 59).

An increasing amount of research has also considered culture as the fourth pillar of sustainability (Hawkes, 2001; Reubens, 2016; Soini & Birkeland, 2014). Despite its prominent roles within the society, the cultural heritage is not part of the main discourse in sustainable development (Boccardi & Duvelle, 2013). Within the context of cultural sustainability, ‘intergenerational equity’ is the primary factor that influenced the management of cultural capital as “the stock of cultural capital, both tangible and intangible [which] embodies the culture we have inherited from our forebears and which we hand on to future generations (Throsby, 2005)”. A similar perspective is shared by Soini and Birkeland (2014) highlighting the importance of conserving and preserving cultural capital in sustainable development. Although their study shows that this particular pillar is still an evolving concept, it is an important factor capable of enriching sustainable development efforts. In retrospect, sustainability can be used as a practical consideration in the process of safeguarding and sustaining the cultural heritage.

The discourse on cultural sustainability includes the preservation of cultural elements, for instance, local identities, traditional practices, regional histories, material objects, technological aspects, social constructions, local knowledge; however, in practice not everything can be preserved for the future (Soini & Birkeland, 2014). This poses the critical question of which aspects need to be preserved. Essentially the considerations do not only include cultural but economic factors as well (Soini & Birkeland, 2014). This research suggests that sustainability can be one of the considerations in the efforts of preserving the cultural heritage. Next to this, there is a shift in the perception of heritage preservation which focuses on interactions *with* the past instead of preservation *of* the past (Loulanski & Loulanski, 2016); interactions that are also significant in the present. In this context, cultural sustainability is positioned between cultural preservation as well as its evolutions; hence, it is critical to be mindful of the balance between the two (Reubens, 2016, p. 58).

Boccardi and Duvelle (2013) highlight that the cultural heritage reflects the mutual adaptation over time [and across generations] between humans and their environment; it symbolizes people’s attitudes, beliefs, and relationships both individually and collectively; and it also represents what people value in order to maintain their well-being. They stressed the importance of deepening our understanding of the connection between cultural heritage and sustainable development which entails identifying quantitative and qualitative indicators to express their connections. This perspective underlines the need for this research to identify indicators that express the connection between heritage products and sustainability.

In summary, sustainability is a continuous effort of improving the current state of the world. One of the critical aspects of initiating such efforts is identifying what is to be sustained (Ehrenfeld & Hoffman, 2013, p. 23; Faber et al., 2005). To initiate this effort, it is important to identify: 1) what is to be sustained, 2) the goal of the effort, and 3) the various factors surrounding the effort of sustaining a chosen artifact. This research focuses on the effort of identifying and eliciting values of heritage products that promote a sustainable way of living. One issue in adopting the four pillars of sustainability in this research is the fact that these theories did not include an explicit position for heritage products or in general the artificial environment in their model. To resolve this issue, this research discusses a theory of sustainability that includes the artificial environment in its construction.

Sustainability and the Artificial Environment

Identifying the position of heritage products or the artificial environment within the context of sustainability is one of the key components of this research. However, the theories related to the four pillars of sustainability did not provide an explicit positioning for the artificial environment in their models. This leads to the exploration of a theory on sustainability that is linked to the capital theory, which includes constructed or manufactured elements in its framework. McElroy and Van Engelen (2012) proposed the use of a ‘capital-based’ (also ‘stock-based’ or ‘wealth-based’) system as an approach to sustainability. Their proposal is grounded in the understanding “that, ultimately, the sustainability issue is about how much stocks or resources we leave to future periods or future generations (p.18).” Based on this perspective, the capital theory relates to the resources known as capitals or an active component of the world that can “generate flows of valuable goods and/services.” The system highlights four different active components or types of non-financial capitals concerning sustainability (McElroy & Van Engelen, 2012, p. 34):

- *Natural Capital* relates to ecological resources that provide living sustenance, regulate and balance the surroundings and generate material flows to meet the needs of living organisms.
- *Human Capital* refers to the actions and well-being of individuals which include “knowledge, skills, experiences, health, and ethical entitlements.”
- *Social Capital* comprises of “shared knowledge and organizational resources” that relates to actions and well-being in a collective level.
- *Constructed Capital* “consists of material objects and/or physical systems or infrastructure created by humans”; in this sense constructed capital is “the material world of human artifacts” or the artificial environment.

These capitals are categorized into ‘*Ecological sustainability*’ which consist of the components from natural capital and ‘*Social sustainability*’ which comprises of human capital, social capital, and constructed capital (McElroy & Van Engelen, 2012, p. 225). ‘*Ecological sustainability*’ focuses on maintaining the health and vitality of the natural

capital and can be measured through capital consumption. This category is comparable to the second pillar of sustainability—Environment. *'Social sustainability'* can be measured through capital production which includes active components—from human, social, and constructed capital—that are essentially human-made (McElroy & Van Engelen, 2012, p. 57). The components of human and social capital are comparable to the first pillar of sustainability—People.

McElroy and Van Engelen also highlight that understanding sustainability performance “is a multi-year phenomenon, not a monthly or quarterly one”; hence, its indicators should be oriented accordingly (2012, p. 166). From this perspective, economic activities related to sustainability should not only take into consideration current shareholders’ interest (i.e. their profits) but also the interest of individuals, communities, the natural environment, and the artificial environment because these tangible elements are, essentially, affected by such activities. This research focuses on understanding the context of sustainability from intergenerational perspectives by exploring values inherent within products that are inherited from the previous generations.

Summary

Figure 4.14 illustrates elements of sustainability discussed in this subsection. As seen in the figure, this research adopts the concept of ecological sustainability and social sustainability proposed by McElroy and Van Engelen (2012) as the main structure. Ecological sustainability relates to the natural environment which provides resources and receives excess from people and the artificial environment. Social sustainability includes the artificial environment and people. The artificial environment comprises elements of the world that are constructed or manufactured by people. Next to this, people are classified into two categories; collective and individual. This classification is based on human capital which refers to an individual’s actions and well-being and social capital which refers to collective actions and well-being. This classification is similar to two of the value clusters discussed in subsection 4.3.2: value-as-action and value-as-consensus. These three sustainable aspects are considered as the tangible aspect of the world. These aspects are connected through interactions, for example, in the context of economy through flows of goods and services. This means that the tangible aspects are affected by other aspects, for instance, economic and culture activities which stem from human interactions. Therefore, economy and culture can be considered as the intangible aspects of sustainability which activities include the interactions between people, the artificial environment, and the natural environment. This research proposes that the tangible aspects need to be in equilibrium for “the possibility that human and other life will flourish on earth forever (Ehrenfeld, 2008, p. 49)” and the intangible aspects can influence this equilibrium by disrupting, establishing or maintaining the balance.

Based on this concept of sustainability, this research explores the elements of sustainability associated with products and their development processes in the following subsection.

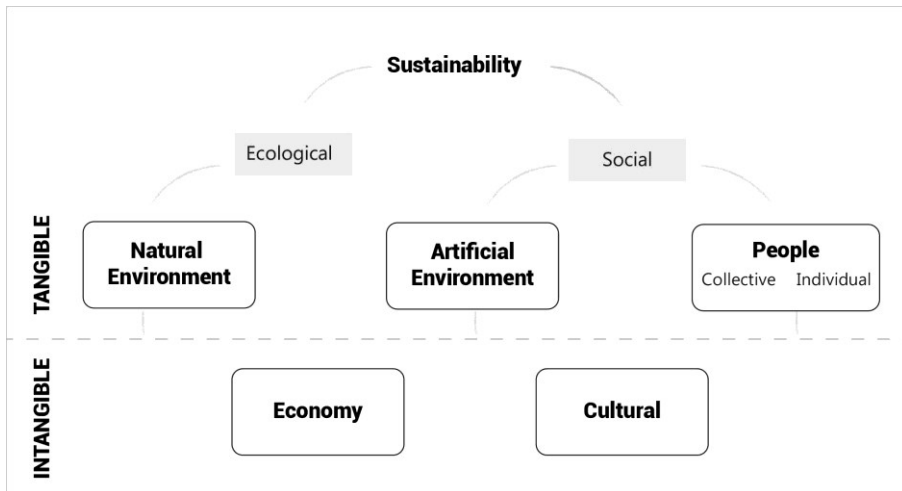


Figure 4.14: The tangible and intangible aspects associated with sustainability.

4.6.2 Sustainable Elements in Products and their Development Process

In principle, design for sustainability is an approach that focuses on product development based on three key aspects of sustainability: people, planet, and profits (Crul & Diehl, 2008). However as discussed in the previous subsection, this research adopts the three tangible aspects of the world based on ecological and social sustainability which include: people, artificial environment, and natural environment. Following this concept, products are considered as part of the artificial environment. The construction of this environment is partly influenced by the decision made by designers and engineers according to their perceptions, understanding, and field-of-expertise (Ehrenfeld & Hoffman, 2013, p. 33; Simon, 1996). The process of designing products occurs at a systemic level whilst being informed by factors related to social, economic, and environment (Crul & Diehl, 2008; Mestre & Gil, 2011). The development of products and services can influence the humans and our environment, for instance, our behaviors and consumptions patterns (Mink, 2016), and shape the general production-to-consumption system (Reubens, 2016). This situation reflects the view of Victor Papanek in his book *Design for the Real World* (1984) underlining that

as designers are responsible for the impacts and consequences of their actions and decision to people and the planet.

Myriad facets of sustainability have been explored within the field of design, especially within the context of the production-to-consumption system (for example research by Jin, 2015; Keskin, 2015; Reubens, 2016 among many others in the DfS program). The use of sustainable product innovation approaches, renewable materials, recycling of packaging and explicit end-of-life schemes are some of the areas explored in such research. Initially, research on sustainable design was a response to the consumption culture among developed nations, for example, eco-design; then the research expanded into developing nations which is then oriented toward the context of social development (Reubens, 2016, p. 284). In brief, current research efforts includes nurturing inclusive development and innovation which correspond to the call for holistic efforts “towards building an inclusive, sustainable and resilient future for people and planet” by the United Nations Development Program’s (UNDP) (United Nations, n.d.). Although external factors such as policy, regulations, market demands, and business opportunities are perceived as the drivers for sustainable design (Reubens, 2016, pp. 72–73) recent development includes efforts related to the social aspect of sustainability as well.

The social aspect of sustainability in design emphasizes the collective goals in which the development efforts are influenced by creative assimilations of existing assets, for example, social capital, cultural heritage, historical perspectives, traditional craftsmanship as well as advanced machines and technologies (Manzini, 2014). Examples of research projects that focus on this aspect are *Design for Social Innovation and Sustainability* or *DESIS Network* (Manzini, 2014), *Future Living Studio* (Jin, 2015; Jin, Crul, & Brezet, 2012), *Design for the Base of the Pyramid (BoP)* (Diehl, 2010; Prahalad & Hart, 2002) and *Design for Development* (Mink, 2016, p. 17) among many others. Essentially, their goals are oriented towards the act of designing and improving the current situation whilst taking major considerations of the social components of the projects or initiatives. Such efforts often include collaborations with local stakeholders to explore the different facets of sustainability and make efficient use of their current resources and capabilities. This concept is adapted in the design intervention approach introduced in subsection 3.2.2 of this thesis.

Various approaches have been developed in relation to the process of designing in the context of sustainability. This research examines four approaches which have been developed within the Design for Sustainability (DfS) research program to identify the different elements taken into consideration in the product development process: a) *D4S Strategy Wheel*, b) *Sustainable Design Elements*, c) *Future Living Studio 3*, and d) *Holistic Sustainable Checklist*. A detailed explanation for each approach can be found in Appendix 2. Tables 4.5, 4.6, and 4.7 show different elements of sustainability that are taken into considerations in these approaches.

New Concept Development	Product Component Level		Product Structure Level			Product System level		
	1. Selection of low impact material	2. Reduction of materials usage	3. Optimization of production techniques	4. Optimization of distribution system	5. Reduction of impact during use	6. Optimization of initial lifetime	7. Optimization of end-of-life system	
Dematerialization	Cleaner materials	Reduction in weight	Alternative production techniques	Less/cleaner/usable packaging	Lower energy consumptions	Reliability and durability	Reuse of product	
Shared use of products	Renewable materials	Reduction in (transport) volume	Fewer production steps	Energy-efficient transport mode	Fewer consumables	Easier maintenances and repair	Remanufacturing or refurbishing	
Integrations of functions	Lower energy content		Cleaner energy consumption	Energy efficient logistics	No waste of energy / consumables	Modular product structure	Recycling material	
Functional optimization of product (components)	Recycled materials		Less production waste	Fewer /cleaner production consumables			Classic design	Safer incineration
	Recyclable materials						Strong product-user relation	

Table 4.5: Elements of Sustainability based on D4S Strategy Wheel adapted from Brezet and van Hemel (1997) by Crul and Diehl (2008).

Material Selections	Production	Distribution	Usage	End-of-life	Social	Culture	Design
<i>SUSTAINABLE DESIGN ELEMENTS - Long (2013)</i>							
Recycled material	Material reduction	Reduce transport volume		Optimize end-of- life	Social manufacturing Good working condition	Preserve local culture	
Renewable materials	Natural treatment						
Local materials	Efficient manufacturing						
<i>FUTURE LIVING STUDIO 3 - Jin (2015)</i>							
Use local material	Reduce Number of production steps	Reduce weight	Share use of products	Reduce product waste			Modular Design
Use Renewable Material	Avoid toxic substances	Reduce transport	Integration of function				Minimize the use of fasteners
Reuse recyclable material	Reduce number of rejects	Reduce storage volume	Function optimization				Foldable and stackable design Modular Design

Table 4.6: Elements of Sustainability based on Long (2013) and Jin (2013).

Material Considerations	Product Considerations	Distribution Considerations	Consumer Use Considerations	End-of-life Handling Considerations
<i>HOLISTIC SUSTAINABILITY CHECKLIST – Reubens (2016)</i>				
Renewable materials	Minimum material	Minimum product volume and weight	Minimum / Clean Energy use	Reduce material complexity
Minimally treated materials	Minimum product steps	Minimum and clean transport	Minimum consumables	Biodegradable
Recyclable materials	Renewable energy for production	Local Product-to-Consumption	Safe to use	Easy to disassemble
Recycled materials	Minimal energy for production	Minimum packaging	Customizable	Reusable
Local materials	Low emission techniques	Reusable packaging	Easily upgraded	Recyclable
Fairly traded materials	Proper management of productions effluents and waste	Recyclable packaging	Classic design	Promote/uses local recycling systems
Ecologically certified materials	Reduce/Reuse production waste	Packaging made from low impact material	Minimum and local maintenance repair	
Non Toxic materials	Indigenous treatments and process			
Less/no materials from intensive agriculture	Consulting indigenous communities on production issue that affects them			
	Safe and healthy work environment			
	Fair wages and benefits to producers			
	No child labor			
	No forced labor			
	Fair working hours			
	Freedom of association and collective bargaining			
	No discrimination			
	Local employment opportunity			

Table 4.7: Elements of Sustainability based on Reubens (2016).

All the approaches adopted parameters that can be linked to the generic production-to-consumption system as highlighted by Reubens (2016, p. 261) which include: material, production, distribution, consumer use, and end-of-life handling considerations. Apart from these basic design parameters, there are also some differences in the parameters within these approaches. For example, Jin (2015) and Crul and Diehl (2008) include design (or new concept development) as one their parameters while Long (2013) includes social and culture parameters in his approach. In the following title, this research synthesizes these parameters and their elements

based on the ecological and social sustainability aspects. This process generates a framework that represents the elements of sustainability associated with products.

A Framework to Identify and Elicit Elements of Sustainability in Heritage Products

Figure 4.15 illustrates the adaptation of the parameters and their elements as indicators to identify and evaluate elements of sustainability hidden within values of heritage products. From the figure, it can be seen that sustainability is expanded into ecological and social sustainability as discussed in subsection 4.6.1. Ecological sustainability relates to the ‘natural environment’ while social sustainability is connected to the ‘artificial environment’ and ‘people.’ Two parameters related to the aspect of ‘people’ are collective and individual. Next to this, this research adopts the general phases of production-to-consumption as part of the parameters for ‘artificial environment’ and ‘natural environment.’ There are five phases which are considered relevant to the ‘artificial environment’: design, production, distribution, usage, and end-of-life. Due to their overlapping content production and distribution are merged into one parameter: production. Only one parameter is associated with ‘natural environment’ which is material.

The figure also exhibits the elements of sustainability listed under each parameter. These elements originated from the design approaches discussed earlier, however, in this list, the adverbs used to highlight certain reduction or increment of the elements is neutralized. For example, the element ‘lower energy consumption’ in *usage* (from *D4S Strategy Wheel*, Table 4.4) is adjusted to ‘energy consumption.’ In the context of this research, this element is listed to identify and elicit values that are associated with energy consumption. Hence, the assessment of whether a process or practice consumed less or more energy is irrelevant; instead the research intends to learn and understand about energy consumptions associated with products and how they may contribute or influence sustainability. These adjustments are necessary as the research intends to identify elements of sustainability that are embedded within existing products instead of comparing them to a certain standard of practice. This framework is used as an indicator in the process of identifying and eliciting elements of sustainability in heritage products which is part of the fourth analysis in *Chapter 7: Analysis and Discovery*.

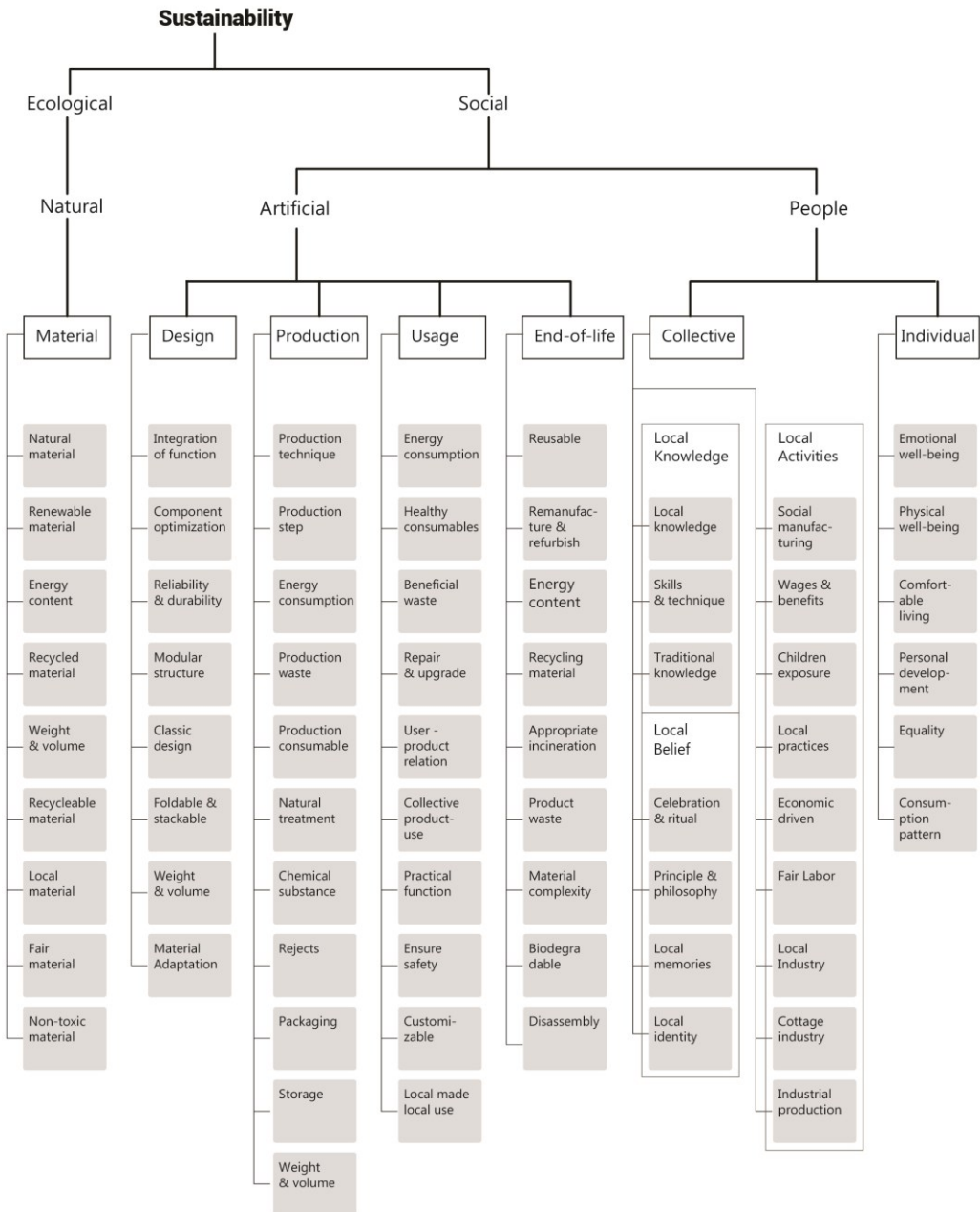


Figure 4.15: The framework of elements of sustainability in association with products (to be written as Framework of Sustainable Elements (FoSE) in this thesis).

4.6.3 Conclusion

This section presents the theoretical exploration conducted based on **P4** where the research focuses on the second area of application for values of heritage products: as a resource to elicit elements of sustainability that are useful for modern-day sustainable initiatives. Figure 4.16 illustrates the adaptation of the framework as an indicator to screen the values of heritage products and elicit those that are linked to elements of sustainability associated with products.

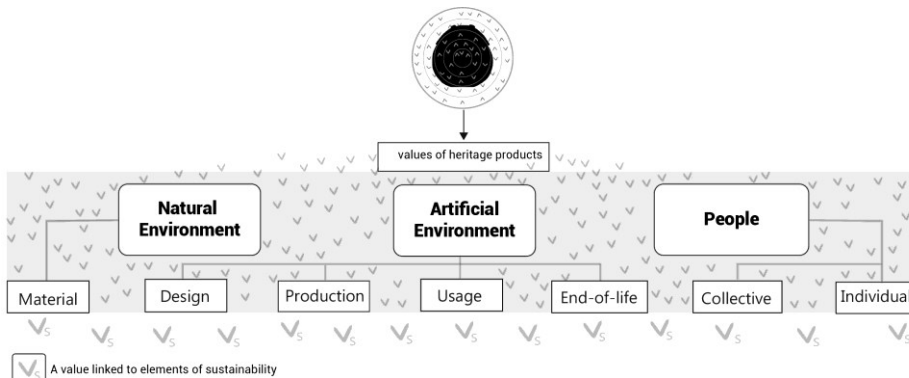


Figure 4.16: The use of Framework of Sustainable Elements to filter values of heritage products.

This section has discussed the present context of sustainability which underlines a well-known driver of unsustainability: our modern consumptions that are expanding beyond the capacity of the planet. It also pointed out that the act of producing for human needs will always, inevitably create new needs. This underlines the importance of understanding what we value as it would eventually influence the way we consume. There are various reasons and motivations behind our consumptions habits. These habits are deeply rooted in the construction of our culture, our routine behavior and the way we live our everyday. Thus understanding and being aware of the interactions we choose to repeat and sustain over time may lead to healthier patterns of consumptions.

It is important to emphasize that the perspective taken in this research is not a total reconstruction of our way of living; instead, it aims to identify and elicit values that are already part of our culture—those that instill and promote our well-being, economic prosperity, ecological sustenance, and a flourishing society. If values rooted in our cultural heritage can offer such benefits, we should strive to restore and reclaim them in our day-to-day life. Strengthening sustainable practices that are rooted locally also offers a sense of awareness and appreciation for its people and indirectly safeguard traditional practices for the future. Moreover, enhancing and reinforcing existing practices can be favorable than adopting a new practice.

This research proposes that heritage products comprise of accepted values that promote a sustainable way of living. In order to identify and elicit these values, it introduces a concept of sustainability that explicitly shows the position of heritage products, i.e. the artificial environment as one of the key aspects in sustainability (Figure 4.13). Based on this concept, this research generated the framework of sustainable elements associated with products which will be used as an indicator to identify and elicit values of heritage products associated with the elements of sustainability. This research revisited **P4** and refined a segment that refers to ‘contemporary standards on sustainability’ (highlighted in grey) into ‘the framework of sustainable elements associated with products’ shown below.

Proposition 4

Heritage products comprise of interactions from the past which can be useful in modern day sustainable initiatives, this research proposes that contemporary standards of sustainability—especially those established in the design field—can be used as indicators to identify and elicit these interactions.

Proposition 4a

Heritage products comprise of interactions from the past which can be useful in modern-day sustainable initiatives, this research proposes that the framework of sustainable elements associated with products can be used as indicators to identify and elicit these interactions.

In the following section, the research presents the conclusion for Chapter 4 and an update on the conceptual research model.

4.7 Chapter 4: Conclusion

This chapter discussed the literature exploration conducted for this research. It has been divided into two parts with four main sections (4.2 and 4.3 for Part 1 and 4.5 and 4.6 for Part 2). Each section presents the theoretical embedding behind the initial propositions introduced in section 2.3. By the end of each section, the research revisited each proposition and refined them according to the literature findings. Figure 4.17 illustrates the Conceptual Research Model with additional inputs based on the refinements of each proposition.

From the figure, it can be seen that **P1** has been transformed into **P1a**. The research adopts the theory of boundary objects as a mechanism to examine the exchange of knowledge between craft and design domains and the articulation of tacit knowledge into explicit forms. Next, **P2a** indicates that the composition of values inherent in heritage products can be described based on a set of interrelated elements associated with products. This research defines this set of interrelated elements based on the five

layers of product elements: Aesthetic, Interaction, Performance, Construction, and Meaning. Table 4.8 presents the overview of the first and second proposition and their refinements.

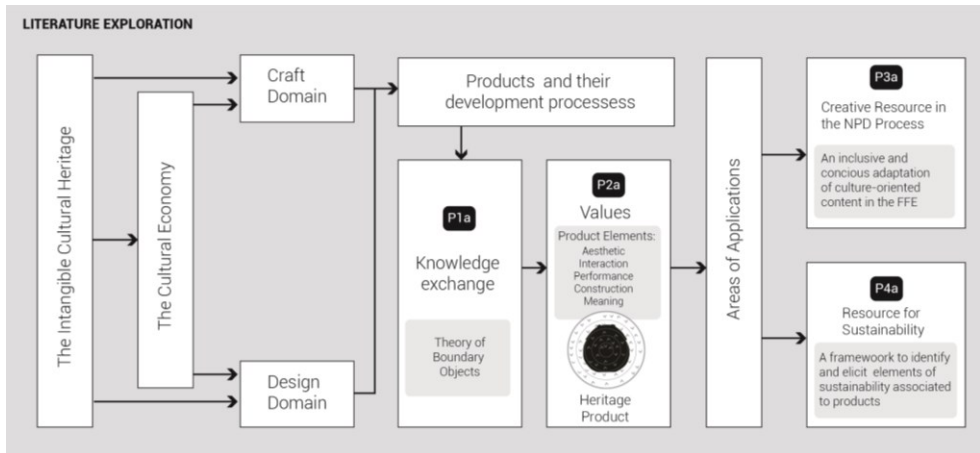


Figure 4.17: The Conceptual Research Model with the refinement for each proposition.

Part 1: Identifying Values of Heritage Products

Proposition 1

The craft domain and the design domain interests in products and their development processes offer an opportunity for both domains to exchange their knowledge about heritage products and a chance to transform the tacit knowledge associated with these products into a meaningful resource.

Proposition 1a

The craft domain and the design domain interests in products and their development processes offer an opportunity for both domains to exchange their knowledge about heritage products; the theory of boundary objects can be used to examine the exchange and articulate tacit knowledge associated with heritage products into a codified form.

Proposition 2

Values are attributed to products; this research proposes that these values are a set of interrelated elements that is shared over time and across generations; and between craft and design domains.

Proposition 2a

The composition of values attributed to a heritage product can be understood, described, and nearly decomposed according to a set of interrelated elements that comprises of aesthetic layer, interaction layer, performance layer, construction layer, and meaning layer.

Table 4.8: The refinement for Proposition 1 and 2.

This research finds that the outcome of *Part 1: Identifying Values of Heritage Products* could be adapted and used as a creative resource for design and sustainability initiatives. This understanding leads to the second part of this chapter—*Part 2: Applying Values of Heritage Products as a Creative Resource*. As discussed earlier, this research focuses on two potential areas of application where values of heritage products can be useful. In **P3a**, values of heritage products are adapted as one of the creative resources in the product development process. Based on this proposition, the

research focuses on an inclusive and conscious adaptation of culture-oriented related content in new design ideas. These insights lead to the development of a structured approach that includes 1) the participation of local stakeholders from craft and design domains and 2) the use of heritage products as one of the creative inputs in the product development process. Details on the development of the structured approach are presented in the next chapter.

Next, in **P4a** values of heritage products are used as a resource for sustainability, specifically, in eliciting elements from the past that are connected to modern-day's sustainable initiatives. Following this proposition, this research perceived that values of heritage products could be useful in eliciting elements of sustainability of the past. This research generated the Framework of Sustainable Elements (FoSE) which is served as an indicator to identify and elicit values that are associated with sustainability. This framework is used to analyze the empirical data in Chapter 7. Table 4.9 presents the overview of the third and fourth propositions and their refinements based on the theoretical exploration.

Next, the research continues with Chapter 5: Design Intervention: Tools and procedure; a chapter that bridges findings from the literature exploration towards the implementation of the empirical exploration.

Part 2: Applying Values of Heritage Products as a Creative Resource

Proposition 3

Applying the values of heritage products as a creative resource in the early stage of the new product development process promotes an inclusive and conscious adaptation of cultural related content in new design ideas.

Proposition 3a

Values of heritage products can be used as a creative resource via a structured approach that includes the participation of local craft stakeholders and the deliberate inclusion of heritage products as an input in the fuzzy front end of the product development process. The approach promotes an inclusive and conscious adaptation of culture-oriented content in new design ideas.

Proposition 4

Heritage products comprise of interactions from the past which can be useful in modern day sustainable initiatives, this research proposes that contemporary standards on sustainability—especially those established in the design field—can be used as indicators to identify and elicit these interactions.

Proposition 4a

Heritage products comprise of interactions from the past which can be useful in modern day sustainable initiatives, this research proposes that the framework of sustainable elements associated with products can be used as indicators to identify and elicit these interactions.

Table 4.9: The refinement for Proposition 3 and 4

Chapter 5

Design Intervention: Setup, Tools, and Procedure

This chapter presents the setup of the design intervention sessions in a case study, the development of the tools and procedure used to guide the implementation of these sessions.

5 The Design Intervention

In Chapter 3 (see 3.2.2), this research describes that each case study consists of a Specific Descriptive Study and a Design Intervention. Based on this setting, a selection of intervention sessions have been structured as a design workshop. The workshop focuses on stimulating activities related to product development process whilst incorporating heritage products as one of the creative inputs. Within the design workshop, this research focuses on three intervention session: 1) *Exploring Heritage Products*, 2) *Design Direction Framework*, and 3) *Concept Generation*. Figure 5.1 illustrates the connections between these specific sessions and the propositions established in the previous chapter. From the figure, it can be seen that **P1a**, **P2a**, and **P4a** are connected to data collected in the session '*Exploring Heritage Product*' while **P3a** is linked to data collected in all three sessions.

In this bridging chapter, the development and structure of the design workshop are introduced and the setup, tools and procedure for the three intervention sessions shown in Figure 5.1 are presented. These tools and procedures will be used in all the case studies conducted in this research. As discussed in subsection 3.3.1, this approach establishes transferability and dependability in which the same tools and procedures are implemented across multiple cases. Included also in the discussion are the relevant data collected in each session and how it will be used in the analysis.

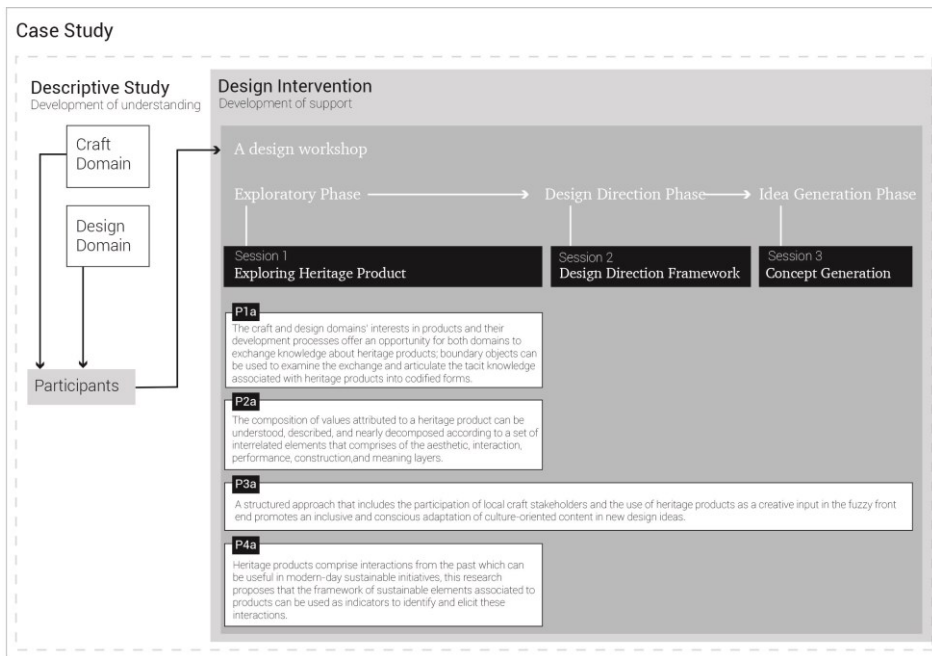


Figure 5.1: The structure of a case study in connection to the propositions.

5.1 A Design Workshop within a Case Study

As discussed in Chapter 4, this research focuses on the use of ‘heritage products’ as a catalyst to bring craft and design domains together (**P1a**) and as one of the creative inputs in the product development process (**P3a**). It also aims to examine the composition of values associated with heritage products (**P2a**) and elicit values that are linked to modern-day’s elements of sustainability (**P4a**). In order to explore these propositions, this research adopted a strategic design approach which had been developed by the researcher in her Master thesis (Suib, 2012) as the foundation in the development of the design workshop (Figure 5.2). One of the key features in this approach is the inclusion of heritage products as one of the creative inputs in the product development process.

Essentially, there are two objectives considered in developing the design workshop: 1) to simulate activities related to the product development process, and 2) to incorporate heritage products as one of the creative resources in the process. The first consideration relates to local stakeholders’ needs and interests to learn and experience the different aspects of the product development process. This factor is essential in engaging interested stakeholders and inviting them to participate in the research. The second factor is connected to the requirements of this research: to identify values of heritage products and their potential applications as a creative resource.

The design workshop structure has been developed based on a modular concept. This means that the structure and combination of the intervention sessions (e.g., the different grey boxes in Figure 5.2) can be customized to accommodate the different needs, requirements, and constraints of local stakeholders in each case study. Although this concept offers certain flexibility in implementing the workshop, the three intervention sessions (in dark grey boxes): 1) *Exploring Heritage Product*, 2) *Design Direction Framework*, and 3) *Concept Generation* are essential in all design workshops as these sessions are directly connected to the research propositions (see Figure 5.1). These sessions have been developed as a means to collect the empirical data for this research, and each intervention session consists of specific design tools and procedures which can be replicated in every case study. Performing the same procedure and using specific design tools allow this research to collect similar data from multiple-case studies.

Next to this, the sessions in light grey boxes represent sessions that adopted existing design tools and procedures from the design domain. Details of these additional sessions (light grey boxes) will not be discussed in this thesis as these sessions are complementary activities to meet the needs of local stakeholders who participated in the case study.

The Exploratory phase (Figure 5.2) consists of a selection of relevant intervention sessions or creative activities aim to develop a shared understanding among

participants, explore various design considerations, evaluate internal capacities and external opportunities as well as inspire the use of local cultural content in the design process. This research has listed seven different exploration sessions; 1) *Exploring Heritage Product*, 2) *Selecting Human Drivers*, 3) *Adapting Sustainable Elements*, 4) *Understanding Consumer Needs*, 5) *Observing Interior Style*, 6) *Identifying Market Trends*, and 7) *Specifying Product Range*. Each session consists of design tools that support the process of exploring certain design considerations. However, the combination of the sessions in this phase is based on the needs and requirements of participants in each case study. This means that, apart from *Exploring Heritage Product* session, other sessions are subjected to change according to context of the stakeholders involved.

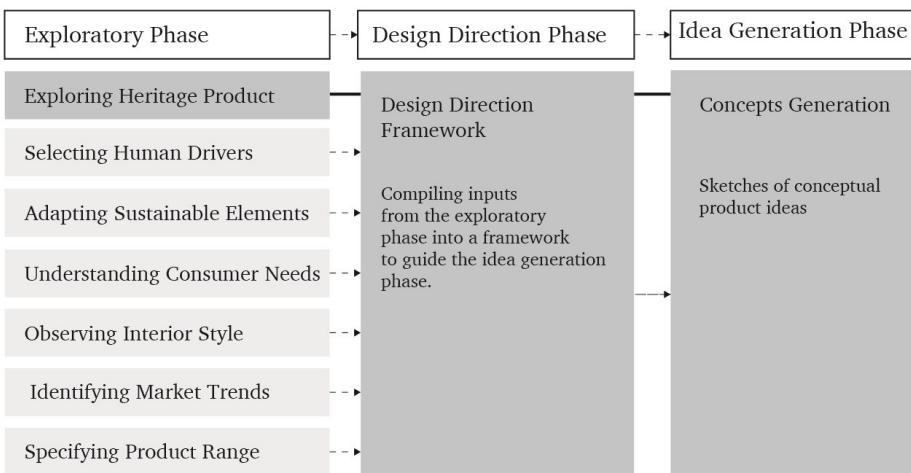


Figure 5.2: The setup of design intervention sessions in a workshop.

Next, the Design Direction phase consists of *Design Direction Framework*—a session in which the outcomes from the Exploratory phase are compiled and visualized with the aim to create a design direction for the participants. This framework serves as a reference to guide them in the Idea Generation Phase. During the *Idea Generation* session, participants are required to generate sketches of new product concepts and present their ideas and experiences during the workshop. The setup of these design intervention sessions provides a structured approach that deliberately includes values inherent in heritage products as one of the creative resources in generating new product ideas.

5.1.1 The Participants

The design workshop is conducted with the collaboration of local craft and design stakeholders who are interested in developing new product ideas and voluntarily participate in the research. Participants from the craft domain needed to be local craftspeople involved in making craft products with traditional characters and who had

inherited their craft skills and knowledge from previous generations. Participants from the design domain need to have certain experience in industrial design field with formal design education background: for example, professional designers or design students. However, as discussed in subsection 3.2.2, this research also adopted an adaptive design method as proposed by Yin (2014, p. 65) in the implementation of its case studies as it offers certain flexibility in mitigating various factors in the field. This means that the criteria in initiating a design workshop can be modified or adjusted to meet to the conditions in the field.

5.2 The Design Intervention Sessions

In this section, this research describes the three design intervention sessions developed specifically for this research: 1) *Exploring Heritage Products*, 2) *Design Direction Framework*, and 3) *Concept Generations*. Each description includes the tools, procedure, collaborative space, and relevant data collected in each session. As discussed in 4.2.4, the tools developed for a design intervention session are considered as boundary objects and the combination of these objects serves as scaffolding to support the session's implementation and instruments to collect data for this research.

5.2.1 "Exploring Heritage Products" Session

This session is the core component in this research (Figure 5.1). Its objective is to explore and articulate the tacit knowledge associated with a selected heritage product. Participants are required to share, elicit, and map their knowledge and experiences on a specific subject—a heritage product. Figure 5.3 illustrates the three primary aspects taken into consideration in setting up this intervention session: 1) the participants (or representatives), 2) the process, and 3) the outcome. The first aspect has been explained in subsection 5.1.1. The second aspect, the process, consists of three basic steps based on the application of three main tools (or boundary objects) developed for the session: heritage products, the Multilayer Product Value (MPV) model and the Product Value (PV) canvas. Finally, the third aspect is the outcome or a tangible output collectively generated by the participants during the session—a mapped PV canvas. This tangible output is the session's artifacts discussed in subsection 3.2.2 and are one of the primary data used in the analysis.

Heritage Products

This research defines heritage products as products that are inherited and learned from the previous generations with meaningful connections to individuals, families, local communities, or societies, if not a combination of those things, and embedded with values that we want to safeguard for future generations (see 1.1.2). These products can be part of the tangible as well as intangible cultural heritage. A heritage product is considered to be part of a tangible cultural heritage when the actual product was directly inherited from the previous generations. However, when the original product

is not directly inherited, it is considered as part of the intangible cultural heritage as this type of heritage product pertains to values similar to the ones used by the previous generation.

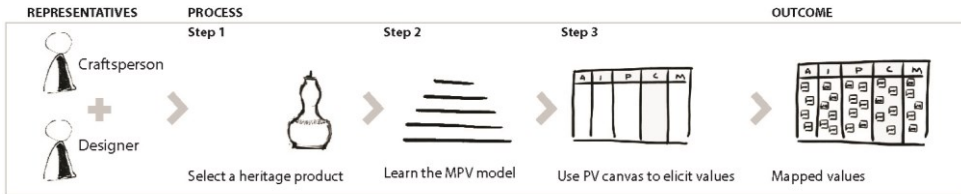


Figure 5.3: The setup structured for the session 'Exploring Heritage Products'.

Figure 5.4 illustrates two heritage products; a stone mortar (*batu lesung*) and a cheese slicer (*kaasschaaf*). The first product is part of Malay heritage while the latter is related to the Dutch heritage. Both products are available in the researcher's kitchen, however, only the stone mortar is considered as part of her heritage since its existence and applications can be traced back to her mother, grandmothers as well as her great-grandmother. The cheese slicer, however, is a product that has been adopted due to her experience and exposure to the Dutch culture. Furthermore, as the stone mortar is not the one that has been used by her elders, this particular stone mortar is considered to be part of the intangible cultural heritage as its values and meaning still permeates in her everyday cooking, highlighting the influence of Malay cooking culture which is part of her heritage.



Figure 5.4: Examples of heritage products: a) Stone-mortar, and b) Cheese slicer.

Although some heritage products may be losing their place in today's societies, their presence remain eminent in the craft industry. Within the context of this intervention session, a heritage product is perceived as an epistemic object—objects of inquiry—as well as a platonic object—capable of representing two knowledge perspectives (i.e., craft and design). This research uses the characteristic inspirational stimuli as proposed by Gonçalves (2016, p. 56)—accessibility, availability, applicability, and authenticity—as part of the criteria in selecting heritage products to be used in the design intervention. This means that in order for a heritage product to be selected for the session, it needs to be:

- Authentic and part of participants' local cultural heritage;
- Accessible by all the stakeholders involved in the design intervention;
- Available during the design intervention session;
- Applicable and relevant for implementation of the design workshop.

The Multilayer Product Value (MPV) Model

The second tool is the MPV model (Figure 5.5) introduced to guide content sharing during the intervention session. This model was adopted as one of the tools used in a strategic approach towards sustainable heritage products in Vietnam (Suib, 2012). In subsection 4.3.4, this research discussed a set of interrelated elements based on five layers of product elements as the foundation to develop a lens to explore values inherent within a heritage product:

- ***Aesthetic***, or the physical outlook of a product;
- ***Interaction***, or the relationships and dynamic connections between a product and its surroundings (which include people, the natural, and the artificial environments);
- ***Performance***, or the functions and capabilities of a product;
- ***Construction***, or the process of how a product is made; and
- ***Meaning***, or the metaphysical aspects of a product.

Figure 5.5 illustrates how these layers are specifically used to represent the composition of values associated with heritage products. As part of its development, this research also includes a selection of 'catalyst words' within each layer of the MPV model to support the process of exploring values of a heritage product during the intervention session. During the session, this model is introduced as a reference to trigger discussion points among participants, supporting them to share their knowledge and experience on a selected heritage product.

The Product Value (PV) Canvas

The third tool or boundary object is the PV canvas which is an extension of the MPV model (Figure 5.6). This poster-sized canvas is comprised of five columns—one for each layer—and provides a common boundary for the participants, a space where they can elicit and map their knowledge about a selected heritage product in a systematic way. Thereby, the canvas serves as a common platform for articulating part of the tacit knowledge about a heritage product into explicit form. Subsection 4.3.3 highlights that 'accepted values' are interactions that have been repeated either individually or collectively; therefore, these values are easily shared with others. In this session, statements mapped onto the PV canvas are considered comparable to 'accepted values' as the statements mapped onto the PV canvas are comprised of: a) participant's personal experience which is connected to value-as-action, and b) shared experiences or collective understanding which is related to value-as-consensus.

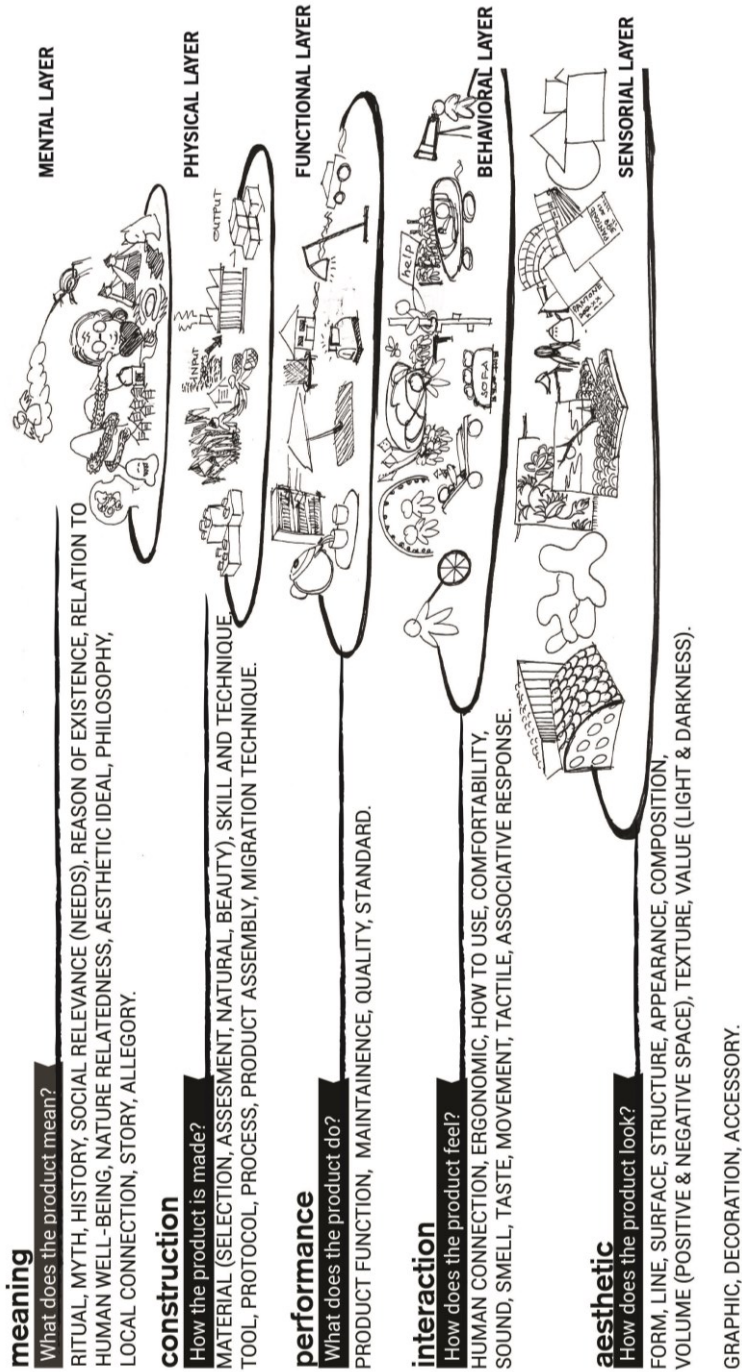


Figure 5.5: The Multilayer Product Value (MPV) model.

aesthetic	interaction	performance	construction	meaning
How does the product look?	How does the product feel?	What does the product do?	How the product is made?	What does the product mean?

Figure 5.6: The Product Value Canvas.

Procedures and Data Collection

The combination of a selected heritage product, the MPV model, and the PV canvas form a systematic approach to share and articulate tacit knowledge associated with heritage products into explicit forms using the layers of the MPV model as the standard. These three objects serve as scaffolding to support the process of exploring values inherent within a heritage product. Table 5.1 presents the procedure used to conduct the session. Data collected from this session is essential in this research as its tools, procedure, and outcomes are connected to all the research propositions. In brief, the research captures the interactions between participants and the tools used in this session—heritage products, the MPV model, and the PV canvas—and collects the outcome in the form of the mapped PV canvas.

1. Selecting a heritage product

Identifying a heritage product (or heritage products) inherited by the participants from the previous generations (e.g. from their families, local community or society). A heritage product that is closely connected to the participants is selected. It is recommended that the actual product is present during the session; however, if this is not possible a picture of the product may suffice as a reference.

2. Introduction about the MPV model and the PV canvas

A brief explanation about the different layers associated with the model and how to use the canvas is given to the participants.

3. Preparing tools for the session

Display a print out of the MPV model (on A4 or A3 size) where it can easily be used as a reference during the session. Prepare the PV canvas on a poster sized paper (e.g., A1 or A0). Provide sticky notes and markers for the participants.

4. Exploring the values associated with the heritage product

With the support from the facilitator (also the researcher), the participants share their knowledge and experiences related to the selected product, discuss and elicit information from each other, and map part of their exchanges onto the PV canvas.

5. Presentation and discussion

By the end of the session, the participants present their mapped PV canvas, discuss the outcome of the session, share some of the interesting insights about the heritage product, and reflect upon their experience.

Table 5.1: The procedure for 'Exploring Heritage Product' session

5.2.2 Building the “Design Direction Framework” Session

The objective of this session is to generate a design direction as a reference to be used during the idea generation session. Participants are asked to compile the outcomes from all the sessions conducted in the Exploratory Phase and visualize them in the Design Direction Framework. A mapped Design Direction Framework is later used as a reference to guide the participants in generating new product ideas and represents the outcome of this session.

The Design Direction Framework

This framework is the only tool established for this session. This framework is devised with the aim to visualize a shared direction in developing new product ideas. Figure 5.7 presents an example of a Design Direction Framework that consists of a target market, sustainable values, consumer trends, human drivers, five values selected from a mapped PV canvas, and a selection of product range (or types). As this framework is used as a reference during the Idea Generation session, any new product ideas with adaptation of values associated with the selected heritage product can be traced back to the mapped PV canvas and, ultimately, the heritage product. It is important to highlight that the composition of the Design Direction Framework can be different between case studies as its content is depended on the intervention sessions structured in the Exploratory Phase. Nevertheless, every framework generated in this research includes a segment of selected values associated with heritage products.

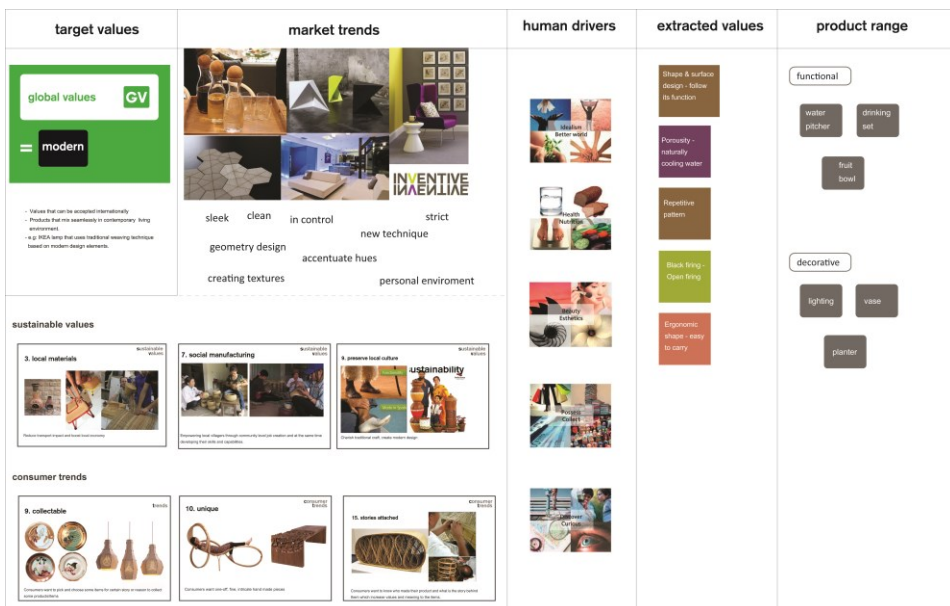


Figure 5.7: An example of a Design Direction Framework (excerpt from Case Study 3).

The Procedure and Data Collection

The Design Direction Framework represents a shared objective and understanding among participants about their design direction. By compiling and visualizing the outcomes generated in the Exploratory Phase, this research aims to systematically include values of heritage products as a source of reference in generating new product ideas. Table 5.2 presents the procedure developed for this session. The content mapped onto the Design Direction Framework, specifically the values (as statements) extracted from the mapped PV canvas, are the primary data collected for the analysis of this research. This data represents a culture-oriented content that has been used as creative inputs in generating new product ideas.

1. Introduction about the session

The introduction comprises an overview about the session, its usefulness in the overall design process, and how participants can build their framework in the session.

2. Compiling outcomes from the previous sessions

Participants are required to collect and compile all the outcomes generated from every session in the Exploratory Phase.

3. Mapping the outcomes into a framework

In this stage, participants need to map and visualize all these outcomes together either on a poster size canvas or directly on the wall. The framework needs to be visible and easily seen by all the participants during the idea generation phase.

4. Presentation and discussion

By the end of the session, participants present a brief summary about their design direction, discuss the outcomes from the session, and reflect upon their experience.

Table 5.2: The procedure for 'Design Direction Framework' session.

5.2.3 "Generating Conceptual Ideas" Session

This session focuses on the process of generating new product ideas where participants are asked to sketch or write conceptual ideas based on the Design Direction Framework. The session adopted the 'Brainwriting / Braindrawing' technique: a technique that allows participants to express their idea with less influence from the group (Tassoul, 2009, p.54). This technique is selected because it offers a way for participants to explicitly share their ideas within the group, ensure that conceptual ideas can be generated in accordance within the time constraint and similar data can be collected by the end of the session of each case study.

The Brainwriting/Braindrawing Technique

Following this technique, each participant is given an A3 paper and requested to select a theme based on one of the products listed (in Product Range) in the Design Direction Framework. The selected theme is written on the top of the A3 paper. Participants are given five minutes to sketch their ideas, then the paper will be passed on to the next person for the second round and the cycle continues until each participant received back their initial paper. Results generated using this technique depend on the number of participants in each group, for example, in a group of three, nine conceptual ideas can be generated in a session. Figure 5.8 shows an example of this session from a case study conducted in this research.



Figure 5.8: Idea Generation Phase (excerpt from Case Study 3).

Procedure and Data Collection

The use of Brainwriting/Braindrawing technique in this session represents a systematic way to generate product concepts, and it is a practical idea generation technique for a session with a limited timeframe. Furthermore, this technique allows similar data/outcomes to be collected across different case studies, and concepts generated in each session can be categorized easily based on themes, participants and/or each cycle. Table 5.3 shows the procedure developed for this session. The outcomes of this session are the sketches or write-up of the conceptual ideas created by the participants which serve as the primary data collected from this intervention session. These sketches and write-ups are used to examine the adaptation of values of heritage products in new product ideas.

1. Introduction about the session

The introduction includes an overview about the session, a general description about idea generation process, explanation on how the session will be conducted using the 'Brainwriting / Braindrawing' technique, and the significance of the Design Direction Framework in the process.

2. Preparing the first cycle

Each participant will be given an A3 sized paper and is asked to select a theme—based on the selections of product in Product Range—from the Design Direction Framework. Make sure there are plenty of pens, pencil, markers, and color pencils for the participants.

3. Initiating the first cycle

Using a timer, participants are given five minutes to sketch or write a concept based on the theme and using the content from the Design Direction Framework as their reference. After the time ended, each participant presents their ideas, briefly. The first cycle ends once all the participants have completed their ideas and passed the paper to the participant sitting next to them.

4. The following cycles

The timer is started when all participants received a paper from their neighbor. Similar to the first cycle, sketching and writing activities end in five minutes and once all the participants have completed and shared their ideas the paper is passed to the next participant.

This cycle continues until the participants receive their initial paper.

5. Presentation and discussion

Participants are asked to present a brief summary about their concepts, discuss the outcomes from the session, and reflect upon their experience.

Table 5.3: The Procedure for 'Concept Generation' session.

5.3 Managing the Data and Assessing Its Quality

This chapter has presented the setup of the Design Intervention in this research which consists of a combination of intervention sessions structured as a design workshop. Essentially, the design workshop serves as an initiative to bring local craft and design stakeholders together in a creative setting, supports the process of developing new product ideas, and represents a platform where representatives from both domains can share and exchange knowledge about products and their development process. The modular concept adopted in this workshop allows this research to include culture-oriented content (i.e., heritage products) as one of the creative resources used in the design process. Three intervention sessions have been developed as a means to collect empirical data for this research: 1) *Exploring Heritage Products*, 2) *Design Direction Framework*, and 3) *Concept Generations*. The combination of these intervention sessions in the design workshop presents a structured approach in adapting heritage products in the early stage of the design process.

Figure 5.9 illustrates an overview of the different data collected in the Specific Descriptive Study and Design Intervention and their connections to the propositions. The figure highlights the primary data used in the analysis of this research: a) the case study descriptions, and b) the sessions' artifacts. From the figure, it can be seen that data collected from the Specific Descriptive Study and the Design Intervention are used to build a case study description and to maintain the quality of the data content from each description is reviewed by a key informant. In effect, a case study description provides context to the artifacts collected from the intervention sessions which are the primary data for this research,. As discussed in subsection 3.3.1 (*Analyzing Sessions' Artifacts across Cases*), these artifacts are an important component of this research as they are materials created by the participants during the intervention sessions. Figure 5.9 presents four types of artifacts that are connected to the propositions.

In *'Exploring Heritage Products'* session, the research observes and describes the use of the tools provided in this session—heritage products, the MPV model, and the PV canvas. This data is used to analyze and understand the roles of these tools as boundary objects, specifically in enhancing the exchange of knowledge between craft and design domains and articulating the tacit knowledge shared into codified forms (**P1a**). The mapped PV canvases are used for the analysis related to **P2a** and **P4a**. To analyze these canvases, the research converts statements written on each sticky note into textual data. This data is then used in a content analysis to examine the composition of values (as statements) attributed to heritage products (**P2a**) and elicit those that are connected to elements of sustainability associated with products (**P4a**). In the *'Design Direction Framework'* session, the research collects the content mapped onto the framework, and in *'Concept Generation'* session, sketches and write-ups of the new product ideas are collected. These artifacts are converted into digital forms and used to examine the adaptation of culture-oriented content, i.e. the statements extracted from the PV canvas in new product ideas. Details of the case study descriptions are presented in *Chapter 6: Empirical Exploration* and results of the analyses are included in *Chapter 7: Analysis and Discovery*.

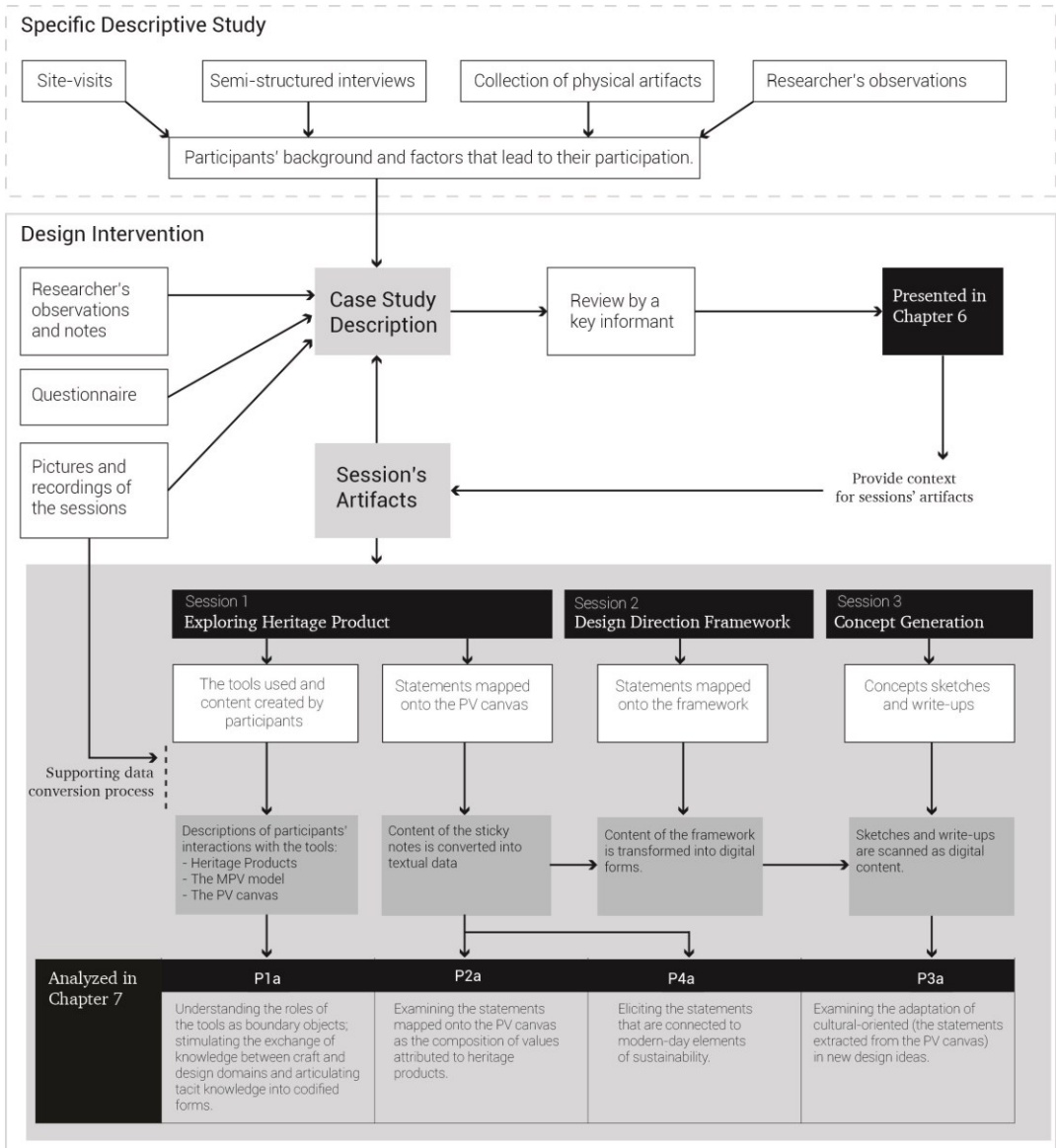


Figure 5.9: The connections between collected data, design intervention sessions, and the propositions.

5.3.1 Managing the Quality of the Data

Section 3.3 introduced the tactics to maintain the quality of the research and highlights that this research adopted the evaluative criteria by Lincoln and Guba (1985) which suggest that trustworthiness of qualitative research involves establishing credibility, transferability, dependability, and confirmability.

Credibility

Krefting (1990) highlights that the credibility refers to the establishment of the confidence in the truth value of the data based on the research design, informants, and context. In this research, the credibility of the case descriptions is built based on multiple types of data collected during the sessions. Specifically, each case description is created based on the researcher's experience, the recordings of the sessions, and the physical artifacts collected during the case study. Furthermore, the descriptions are reviewed by key-informants⁷ to ensure that the content represents a shared narrative and interpretation of the case studies.

Transferability

Transferability refers to the applicability of the findings in different contexts, settings, or groups (Krefting, 1990). In qualitative research, the issue regarding transferability is considered resolved when the original researcher managed to provide sufficient descriptive data enabling another researcher to transfer the findings in another context (Krefting, 1990; Lincoln & Guba, 1985). In this research, the tools and procedure developed for *'Exploring Heritage Products'* session has been adopted by another facilitator and also conducted by the original researcher in a different context. Results of these efforts are presented in section 6.3.9 (*Verification Stage: Evaluation Cases*).

Dependability

This perspective refers to the consistency of the findings in which an inquiry is replicated with the same subjects or in a similar context (Krefting, 1990). However, fieldwork for qualitative research often consists of complex and unexpected factors as it may consist of multiple realities which mean "variability is expected" (Krefting, 1990). Guba and Lincoln (1985) propose that dependability can be established through variability that is linked to identified sources. This research establishes

⁷ A key informant can either be one of the participants in the design intervention sessions or an observer who is involved in a case study but did not actively participate in the design intervention, for example, the lecturer who assisted in the implementation of a case study.

consistency by using the same tools and procedure and collecting similar outcomes during the intervention sessions. As highlighted in subsection 3.3.1 implementing the same procedure should not be confused with ‘replicating’ the same results. In this chapter, this research has introduced the tools and procedure to be used in the field and in the following chapter, this research will present the variability of the results. This setup allows this research to collect data from multiple-case studies and link the data from each case study to the same method of data collection.

Confirmability

This criterion relates to the concept of neutrality which means the research procedures and results are free from bias (Krefting, 1990). Guba and Lincoln (1985) emphasize the neutrality of the data instead of the researcher suggesting that confirmability is achieved when credibility and transferability are established. Apart from establishing these two criteria, this research also chooses to use the sessions’ artifacts as the primary data for the analysis. As this content is created and completed during the intervention sessions, the content collected is considered as agreed upon and approved by the participants by the end of the session. Hence, this data acts as an anchor to the results and establishes a shared understanding between the researchers and participants. In essence, this effort minimizes bias and reduces the researcher’s influence on the data; hence, establishing neutrality.

Data converted from sessions artifacts will be analyzed in *Chapter 7: Analysis and Discovery*. In this chapter, the research will include a discussion on efforts to manage the quality of the analyses. The next chapter introduces the context of the empirical domain: the craft industry of Vietnam and Malaysia, presents the case studies conducted in this research, and describes the evaluation of *‘Exploring Heritage Products’* session.

Chapter 6

Empirical Exploration

This chapter presents the results of the empirical exploration which include the general understanding of the craft industry in Vietnam and Malaysia, an overview of the case studies, and the descriptions of each case study.

6 Empirical Exploration

Section 2.2 has introduced the empirical domain for this research: the craft industry in Vietnam and Malaysia. In this chapter, this research presents the outcomes of the empirical exploration which is divided into a General Descriptive Study and the case studies. The empirical perspectives are presented alongside the theoretical understandings underlining the relationships between the concepts presented in this research in the context of craft in Vietnam and Malaysia. As discussed in section 3.2, a case study is divided into Specific Descriptive Study and Design Intervention. The Specific Descriptive Study allows this research to understand the context of the stakeholders involved in a case study and the Design Intervention represents a design workshop organized to explore and develop new product ideas with local stakeholders. Chapter 5 has discussed the setup, tools, and procedures of the workshop.

The chapter begins with the findings from the General Descriptive Study (6.1). The results of this study are divided into three subsections. This section starts with the introduction of the craft industry of Vietnam and Malaysia (6.1.1) and follows with the findings on their practices and activities concerning the product development process (6.1.2). Next, the discussion continues with the influence of local cultural heritage in traditional and contemporary craft products (6.1.3). The General Descriptive Study also illustrates the process of scouting and inviting interested stakeholders to participate in the design workshop. Next, the chapter presents the overview of this process and its outcomes (6.2) and describes the case studies conducted in this research (6.3). Each description consists of the stakeholders' motivations, the process, and outcomes of the design workshop, specifically of the session *'Exploring Heritage Products.'* The background information of each case study can be found in Appendix 5. Then, the chapter continues with an evaluation of the tools and setup for the session *'Exploring Heritage Products'.* The chapter ends with a conclusion summarizing the empirical findings based on the propositions as well as segments to be analyzed in *Chapter 7: Analysis and Discovery.*

6.1 General Descriptive Study

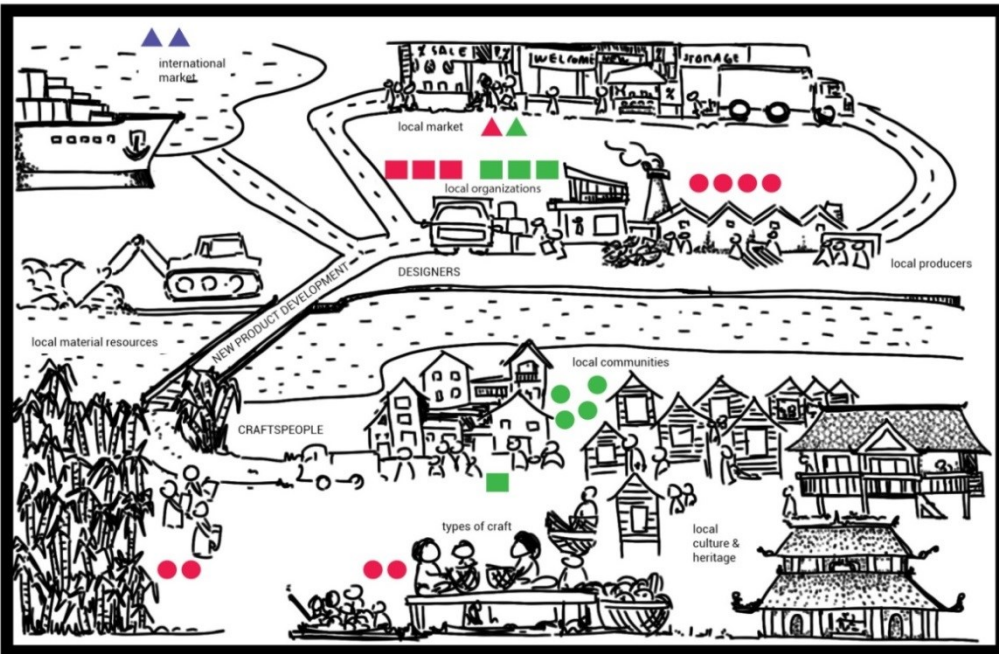
This section presents the results of the General Descriptive Study conducted against the backdrop of Vietnam and Malaysia. As discussed in subsection 3.2.2, a descriptive study refers to research activities that are conducted to understand an existing situation. In the context of this research, this descriptive study has been undertaken to build a general understanding about the local craft industry of two SEA countries, their practices and activities concerning the product development process, and the influence of cultural heritage among the craft community and the local craft products. Furthermore, it also served as a platform for the researcher to scout and invite potential stakeholders to participate in the design workshop. As outlined in subsection 3.2.1, the results of this descriptive study are based on 'real-time data collection';

content that was directly experienced by the researcher through her visits and interactions with local stakeholders (between 2012 to 2014) and the ‘retrospective data’ which refer to data collected from secondary sources, for example, articles, reports, catalogues and brochures. Data from existing sources with similar findings were included in the discussion to support the insights gathered from the observations. As highlighted in subsection 3.2.1, the combination of ‘*real-time data*’ and ‘*retrospective data*’ enables this research to build a robust description of the data gathered from the field. Figure 6.1 presents an overview of the different stakeholders visited, observed, and interviewed during this study and illustrates the locations of these stakeholders based the different points of exploration presented in subsection 3.2.1 (Figure 3.2).

The figure shows that the research activities involved three main stakeholders: local organizations, events (local and international) and local SMEs as well as craft entrepreneurs. The researcher visited three organizations in Vietnam and four organizations in Malaysia. During these visits, fifteen representatives from these organizations were interviewed and six of them agreed to participate in the design workshops. Four local SMEs were visited in Vietnam, and seven representatives were interviewed. During two of the visits, the researcher was accompanied by the SMEs’ representatives to visit the villages where the materials are processed and products are crafted. These two SMEs also participated in the design workshop. In Malaysia, four different craft locations were visited: a) a pottery village in Sayong, b) a craft workshop making lion heads, c) a traditional clay roof workshop, and d) a wood carving workshop. During these visits, twelve craft representatives were interviewed and eight agreed to participate in the workshop. Next to this, the researcher also visited the main craft event in each country and two international events. The grey lines shown in the figure demonstrate how the researcher was introduced to the different stakeholders in this research. Appendix 3 lists in full the research activities conducted in this study. In addition, this research uses findings from theory (Chapter 4) as a reference “to relevant contextual conditions to be described (Yin, 2014, p. 136)” in this descriptive study. It is important to highlight that according to Yin’s perspective (2014, p. 21) on the outcomes of case study approach (see 3.1) that contribute to the theoretical context but not generalizable to the population either in Vietnam or Malaysia.

VIETNAM

MALAYSIA



- Symbols
- ▲ Event
 - Craft producer
 - Organization
 - Vietnam
 - Malaysia
 - International
 - 👤 Craft and Design Representatives
 - 👤 Interviewee
 - 👤 Interviewee+ Participant
 - 👤 Participant

Figure 6.1: The overview of the General Descriptive Study.

6.1.1 Understanding the Local Craft Industry

Development in the craft industry has the capacity to foster social and economic growth, particularly for the rural communities, by creating jobs and providing opportunities; increasing their capabilities, improving income as well as indirectly empowering the local society (Reubens & van Berkel, 2013; UNESCO, 2013; Wan Teh, 1996). Small and Medium Enterprises (SMEs) and craft entrepreneurs often form the majority in a craft industry (Reubens, 2016). In general, SMEs and entrepreneurs are important drivers in the development of industry (Duarte, 2004). Unlike large companies, SMEs and entrepreneurs are flexible and capable of adapting to new situations (Duarte, 2004), creating employment and contributing to the local and regional development (Turner, Ledwith, & Kelly, 2010). Also, the close connection between these businesses and the local communities influences social cohesion (Fassin, 2008). Similarly, the majority of active stakeholders observed in Vietnam's and Malaysia's craft industry are also made up of SMEs and craft entrepreneurs. In the next two titles, this research presents a brief introduction of the context of craft in Vietnam and Malaysia. Each title includes a general overview of the local craft industry, its history, and the country's main craft organization visited during the fieldwork. Figures 6.2 and 6.3 depict a brief impression of the researcher's experiences in both countries.

In Brief: Vietnam's Craft Industry

In the SEA region, Vietnam is one of the big players among global craft producers alongside Thailand and Indonesia, with an estimated of USD 2.5 billion export sales value in 2013 (EVBN, 2015). According to the survey conducted by the 'Project Promoting Fair Trade in Vietnam' 85% of local handicraft producers are involved in exporting (B. T. Nguyen et al., 2015), mainly to three major markets—the US, Japan, and the EU (EVBN, 2015). Currently, over 4000 companies and 2000 craft villages are active in the industry (Vietcraft, 2016) and the majority of these stakeholders are involved in high volume production with low product quality (Brandth, Lindsten, & Nilsson, 2011). In general, the country's manufacturing industry was shaped by the local conditions such as low-wage labor and abundant material resources (Breu, Dobbs, Remes, Skilling, & Kim, 2012). However, the current development indicates that it would be a challenge for the craft industry to maintain this strategy for several reasons, such as the dwindling number of craft villages, the shortage of raw materials supply (T. Nguyen, 2016), and the competition for labor resources with other industries such as electronics and automotive which offer better income and benefits to their workers. These challenges need to be observed closely to maintain Vietnam's competitive advantage among their global competitors.

Vietnam's economic growth and development have been soaring since the *Doi Moi* reform in 1986 (Szydowski, 2008, p. 41). Prior to the reform, craft productions were marginal in comparison to other types of productions (Fanchette & Stedman, 2010, p. 16). The growth of the local craft industry is in line with the country's transition from a



Figure 6.2: An impression of Vietnam.



Figure 6.3: An impression of Malaysia.

centrally planned economy to a market-oriented economy. The resurgence of individual businesses, government policies that focus on non-agricultural rural activities (Fanchette & Stedman, 2010, p. 16), and close relationships with other countries (Szydlowski, 2008) also influence this rapid growth. The local craft industry is vital in alleviating poverty and empowering rural communities (Reubens & van Berkel, 2013) and one of the unique aspects of Vietnam’s craft industry is its craft villages. Such a village represents an area with a community that upholds traditional practices, knowledge, and craft skills; embodied within the local culture, interweaved within their social fabric, and supporting the local economy (Szydlowski, 2008, p. 53). Although craft villages are well-known for their contributions to the craft industry, the production capacities of craft in Vietnam stretch beyond these villages: it includes other peri-urban areas, neighboring villages and ethnic minority communities. In short, the country has established a broad structure of social manufacturing systems which provides the capacity to meet the demands of the local as well as the global markets.

One of the organizations that play an active role in the development of the industry is Vietnam Handicraft Exporters Association (VIETCRAFT). Founded in 2007, the association represents handicraft manufacturers and exporters in Vietnam, providing various business services to its members and connecting them to international buyers and importers. The association strives to build and strengthen the global recognition of Vietnam’s contemporary craft products which include home décor, gifts, and houseware products. Table 6.1 summarizes the export value of craft products in 2012 and the provinces involved in the production process (see also Figure 6.4)(B. T. Nguyen et al., 2015):

Types of Material	Export Value (USD)	Provinces
Rattan and bamboo	232 million	The Northern and Central region produce rattan, bamboo and sedge products. The Southern region produces hyacinth and leaf-based products.
Ceramics	123 million	Hanoi, Bach Ninh, Hai Duong, (craft villages) Dong Nai, Binh Duong (industrial area)
Wood-based products	134 million	Craft villages in the Northern region. Ho Chi Minh, Binh Duong, and Vinh Long (industrial area)
Embroidery	3.6 million	Ninh Binh, Thai Binh, Ha Nam, Hanoi, Thua Thien-Hue, Quang Tri, Lam Dong, and Ho Chi Minh
Textile products	195 million	Hanoi, Ha Nam, Thai Binh
Metal-based products	164 million	Southeastern region, for instance Dong Nai and Binh Duong
Paper products	14,947	Hanoi and Bach Ninh. Ethnic communities such as Cao Lan, Hmong, and Doa are also involved.
Horn & Stone based products	27 million	The Northern region around 89% and the rest are in Central and Southern region.
Other handicrafts	521 million	-

Table 6.1: Types of products material, their export value, and producers' locations (B. T. Nguyen et al., 2015).

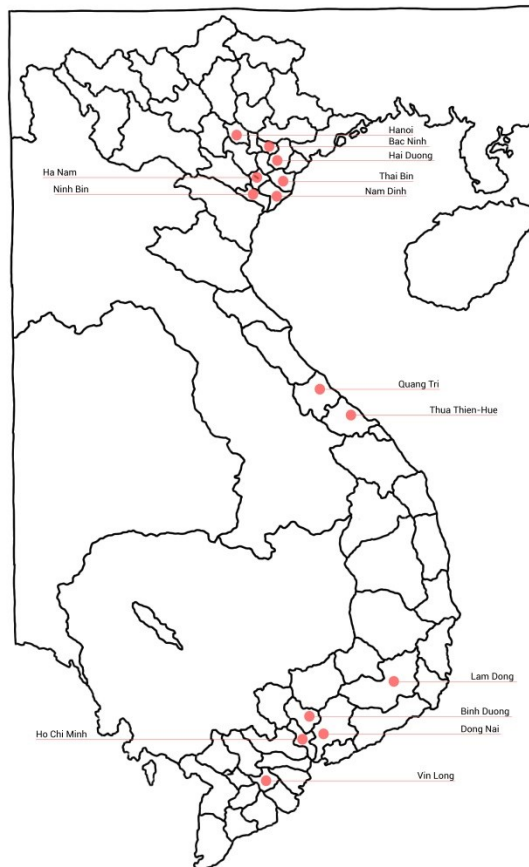


Figure 6.4: Regions active in craft productions (B. T. Nguyen et al., 2015).

In Brief: Malaysia's Craft Industry

Malaysia is a relatively a small player among the international craft producers, and the values of sales for its craft industry were recorded at RM 505.4 million or equal to USD 115 million (Kraftangan, 2016b). This amount was only 4.6 % of Vietnam's total export sales values in 2013. At its current capacity, it is a challenge for Malaysia to compete in the international market alongside its ASEAN counterparts such as Vietnam, Thailand, and Indonesia. One of the contributing factors is the country's lack of labor capacity with relatively low salaries; a prerequisite factor to be competitive in the global craft market. Even in other manufacturing sectors, such as electronics, automotive and construction, Malaysia has been relying on immigrant workers outsourced from countries like Myanmar, Bangladesh, Nepal, and Indonesia. In 2014, it was estimated that 15% of the country's workforce is immigrant workers with 2.1 million registered and an estimate of 1 million undocumented immigrants (Moreno et al., 2015). Apart from this, other challenges faced by the industry are workers' skills and capabilities to meet the quality and standard required by international buyers and lack of information and know-how in shipping and logistics indirectly affecting their

pricing strategy. These challenges influence the chances of closing deals with international buyers.

The craft industry was not classified as part of the manufacturing sector during Malaysia's industrialization program in the 1950s. As a consequence, its development was separated from the mainstream manufacturing industry (Bahrudin, 2013, p. 2). The development of craft started at the beginning of 1984 through the urbanization strategy for rural development program or '*Halacara Baru*' (*New Direction*) that focuses on socio-economic development to increase productivity and income among rural communities (Redzuan & Aref, 2011). As part of the Fourth Malaysia Plan (1981-1985), the craft industry was finally recognized as a sector consisting of the local cottage industry and was included in the country's economic plan (Redzuan & Aref, 2011). Malaysia's craft industry was perceived as part of the cottage industry, often with a family-based business model and linked with traditional craft activities with intensive manual work (Wan Teh, 1996). However, this condition has evolved: modern industrial practices have been adopted within the industry through support from various agencies, such as government-based agencies, non-profit organizations as well as cooperative initiatives from local producers.

One of the organizations that drive this development is Malaysia Handicraft Development Corporation (MHDC) or locally known as '*Kraftangan Malaysia*' (*Kraftangan* means 'handicraft' in the Malay language). Since its establishment in 1979, *Kraftangan Malaysia* has been focusing their efforts on activities and programs to revitalize and promote craft as a contributing sector to the nation's economy (Wan Teh, 1996, p. 6). In general, the organization is responsible for building and developing local capacities and capabilities while taking into consideration traditional crafts and the local cultural heritage. Their activities are directed into five main development programs: 1) Craft Marketing, 2) Craft Entrepreneurship and Development, 3) Research and Development, 4) Craft Skills Development (through programs organized by the National Craft Institute), and 5) Craft Restoration (Kraftangan, 2011). By the end of 2015, a total of 5130 craft entrepreneurs and companies were registered with the organization with 2047 registered enterprises for forest-based products, followed by 1498 for textile-based products, 701 for mix-craft products, 651 for metal-based products and 233 for earth-based products (Kraftangan, 2016a). Figure 6.5 illustrates the distribution of these registered SMEs and entrepreneurs across the country.

6.1.2 Local Craft Products and Their Development Process

This research visited the most prominent craft event in each country: 1) *Lifestyle Vietnam* organized by VIETCRAFT and 2) *Hari kraf Kebangsaan (National Craft Day)* organized by *Kraftangan Malaysia*, to gain an overview about the different craft products available in both countries. Visits to these events enabled the researcher to

learn about craft agencies, and organizations, exhibitors, visitors, and the different categories of products exhibited. Next to this, these events also offered a platform to initiate contacts with potential stakeholders (during or after the events) for possible site visits and interviews to build an understanding about their activities and practices related to the product development process as well as their interest to participate in the design workshop. Using these two events as an exploration point also indicates the limitation of this descriptive study as its results are closely connected to the activities and stakeholders associated with the two main craft organizations.

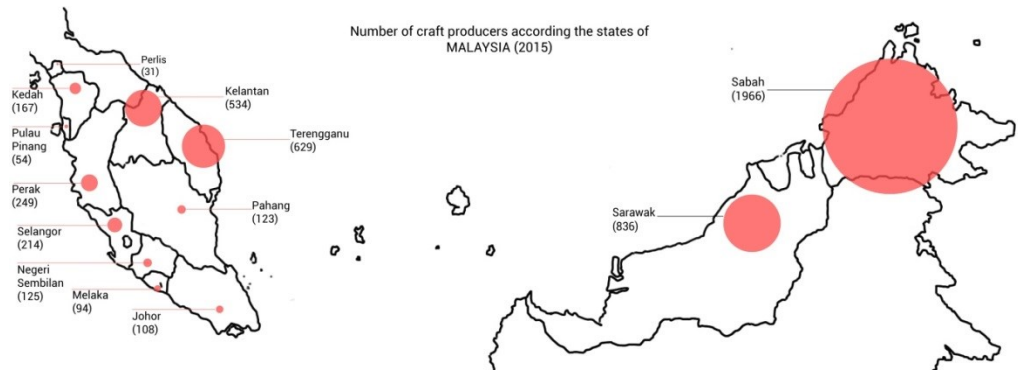


Figure 6.5: The distribution of registered craft producers in Malaysia (Kraftangan, 2016a).

The Context of Craft in Both Countries

Figures 6.6 and 6.7 depict the two craft events held yearly in Vietnam and Malaysia. *Lifestyle Vietnam* is an International Home Decor and Gift Fair organized by *VIETCRAFT* in Ho Chi Minh City. This event has garnered the participation of more than 500 exhibitors across the country and the SEA region with products ranging from traditional to contemporary designs catering to local as well as international buyers. This trade fair is organized as a four-day event offering customized services to international buyers, free-entrance, and factory tours. *Hari kraf Kebangsaan* (National Craft Day) organized by *Kraftangan Malaysia* is one of the biggest craft promotion fairs in the country with a total of 638 participants in 2015. This cultural event is often held over 12 to 14 days with various cultural as well as commercial activities, for instance, craft sales, exhibitions, demonstrations and cultural performances.

These two events present an overview of the craft industry in both countries. Vietnam's craft industry is focused on international markets whereas the local market is the main driver for Malaysia's craft industry. This aspect can influence the development of craft products in each country. The findings indicate that Vietnam's producers tend to be involved in business-to-business (B2B) type of commerce while its Malaysian counterparts deal mostly in business-to-consumer (B2C). Although craft products found in these two events are targeting different market segments, these products are still imbued with elements of local cultural heritage. This situation can be viewed using

the perspectives of craft discussed in 4.2: craft-as-industry and craft-as-culture. In principle, both perspectives can be used as a lens to describe the local craft industry of Vietnam as well as Malaysia. This means that there are elements of the local cultural heritage as well as modern industrial practices embedded within the local craft industry. However, depending on the types of commerce, target users, and products available in the market, one perspective tends to be more dominant than the other.



Figure 6.6: Examples of products exhibited in Lifestyle, 2012, Ho Chi Minh City, Vietnam.



Figure 6.7: Examples of products exhibited in 'Hari Kraf Kebangsaan' (National Craft Day), 2013 in Kuala Lumpur, Malaysia.

Craft products made in Vietnam tend to be bounded by global trends and lifestyle, buyers' purchasing patterns, and demands from both the international buyers as well as end-consumers in various market segments. Hence, the value of local cultural

heritage only plays a small role, if any, in their marketing and sales strategy. In Malaysia, interests and demands for craft products are substantial among local consumers (Muda, Abd Halim, & Wan Mohd Amin, 2011). An article by Bernama (2013) highlighted that the local youths are attracted to trendy handicraft items—products that comprise traditional elements whilst adopting the commercial needs of this market segment. For example, the traditional technique of making *'pandanus plaiting'* mat was adopted in products for modern consumers such as hand bags and laptop bags. These products are often targeted and catered for local consumptions and tourism markets; hence, they are rich with exotic nuances, and traditional values as the elements of local cultural heritage are often used as part of producers' marketing and sales strategy. Based on the organization of the events, the target audiences, and the types of products exhibited, this research identified that in *'Lifestyle Vietnam,'* the perspective of craft-as-industry is more prevalent while in *'Hari kraf Kebangsaan'* the perspective of craft-as-culture is more dominant.

The Growing Interest in Design and the Product Development Process

These two perspectives of viewing craft can also influence the types of products developed within the industry. In essence, the development and survival of the local craft industry are closely connected to the way its stakeholders deal with new challenges and the change in the society. For example, design approaches that are linked to sustainable practices are proposed as one of the means to alleviate challenges faced by the industry (Brandth et al., 2011; Jin, 2015; Reubens, 2016). During this descriptive study, this research recognized a similar trait between the two countries in their practices and activities related to the product development process: design works are often initiated and organized externally. For instance, in Vietnam, design related activities are found to be initiated and organized by international organizations while in Malaysia such activities are implemented by local agencies and organizations.

Four projects have been examined in which international partners and local stakeholders collaborate in Vietnam. These projects focus on developing new craft products with the intention to empower local people, increase their income, and improve their economic conditions and social well-being. These four projects were studied through the researcher's participation, interviews with the stakeholders, or based on the reports that were produced by the end of each project (summary of the projects can be found in Appendix 4). Table 6.2 summarizes the characteristics of these projects.

Table 6.2 shows that design-oriented initiatives funded by international organizations were in collaboration with local partners and external design experts in the projects. The table also presents the participation of the local SMEs in the projects. However, not all the SMEs and entrepreneurs are crafting the products themselves. Instead, a majority of local craft companies in Vietnam play the role of a 'key brokers.' These companies act as an agent responsible for connecting the market and the craftspeople

in the villages. As discussed in section 4.2, they “function as the social glue” which bind production activities that are scattered within the provinces generating a manufacturing system that is intertwined with the local fabrics and its social formation.

Project	International initiatives	Collaboration with local partners	External design experts	Local SMEs and craft entrepreneurs	Direct Involvement of craftspeople
Sustainable Product Innovation (SPIN)	✓	✓	✓	✓	
Crafting-out of Poverty	✓	✓	✓	✓	
Vietnam Sustainable Design	✓	✓	✓	✓	
UNESCO, Craft-Link and Korean Trust Funds	✓	✓	✓	✓	✓

Table 6.2: Four initiatives that involved developing new products observed in this study.

Kraftangan Malaysia founded a subsidiary company called Karyaneka Sdn. Bhd. in 1982 as part of the initiative to promote local craft products. Its mission is to market and promote local craft products to the domestic and international market. *Kraftangan Malaysia* hires in-house designers (both in their headquarters and regional offices) to work with various local companies and craft-entrepreneurs to develop new products. *Kraftangan Malaysia* also launched a designer brand called PREKA in 2013. This brand represents a collection of products developed by their in-house designers with the aspiration to promote products that comprise of both traditional and modern values. Apart from these initiatives, the government is also directly involved in the efforts of sustaining the local craft industry. For example, in 2008, a policy was initiated requiring government officers to wear *batik* based clothing every Thursday, with an exception for officers who have uniforms (Adam, 2008). Next to this, a number of social enterprises initiated by local craft enthusiasts were also established with the aim to promote the diversity and creativity of the local craft industry. One of these social enterprises is *Kita Kita* (the word *kita* means ‘us’ in the Malay language) selling gifts and interior products embedded with local cultural content. The enterprise pledged 10% of their profits for supporting local artisans and craft producers. These examples show that activities related to the development of craft products are influenced by local organizations, external agencies such as government assistance and social enterprise. Indirectly, these influences also have an effect on the product development process within the industry.

This highlights a situation in which the involvements of local craft stakeholders are limited to the later phases of the product development process: for example, in the prototyping and production stages (also mentioned in Chapter 1). The craft stakeholders, specifically the local SMEs, craft entrepreneurs, and craftspeople are not

included in the early stage of the design process as the tasks for these phases are under the responsibility of design experts hired by external organizations. This insight demonstrates the lack of inclusive and equitable involvement of local craft stakeholders in the product development process, particularly in the fuzzy front end and the design process (refer to Figure 1.1). Regardless of their level of participation, there is a growing interest among local craft producers in learning and understanding the process of designing as it is seen as a way to remain competitive, especially in the global market.

The growing awareness about the importance of design among local craft producers led to their interest in participating in this research. Three out of four SMEs visited in Vietnam expressed their interest in joining while four out of six craft entrepreneurs visited in Malaysia agreed to participate in the research. One of the main challenges in this research was to find designers to participate in the design workshop. Essentially, the design domain is not part of the stakeholders within the industry. For example, during the time this research was conducted, none of the craft stakeholders were working directly with local designers. Only one of the SMEs from Vietnam had an experience of hiring designers. As mentioned earlier, usually their engagement with designers is via external agencies or local organizations. Following this insight, this research engaged with local organizations to scout for potential design representatives to participate in the design workshop. In Vietnam, the research worked with two designers from the Green Office, Hanoi while in Malaysia, the researcher engaged with a designer from *Kraftangan Malaysia* and eight design students from Malaysia Institute of Art (MIA). This situation inevitably influenced the selection and organization of the case studies and is discussed further in section 6.2.

The Transmission of Knowledge in Craft

During this descriptive study, this research also explores the transmission of craft knowledge among local craft practitioners. Section 1.1 highlighted that similar to the design domain the craft domain also possesses valuable knowledge when it comes to the product development process. However, craft knowledge often comes in a tacit form; knowledge that is typically personal and dwells within the human mind and body (see 1.1.1). The exchange of knowledge between local craft stakeholders and designers can stimulate local development; however, stakeholders involved need to be aware of the knowledge within their domains that might be of values to the others (see 4.2.4). This research observed the methods of knowledge transmission among local craft stakeholders in Vietnam and Malaysia to better understand the way knowledge is shared and disseminated in the field.

During the visits to two local SMEs, in Ha Nam and Nghe Anh province in Vietnam, the researcher also visited the villages that are working with both companies. These additional trips were organized by the companies enabling the researcher to visit the training centers and villagers responsible for crafting products (or their parts). The

training centers, also located in the village, serve as a training facility as well as distribution and collection points for the crafting villagers. During these visits, the researcher identified two different methods of knowledge transmission. The first is a conventional method (mentioned in 4.2.1) in which craft knowledge is passed on from one generation to the other. This method was observed during the visit to the villagers' homes. During this visit, it was common to find different generations within a family (e.g., the grandmother, the mother, and the daughter) involved in the craft works. The second method involved the dissemination of craft knowledge via the training centers. In this method, the craft training is organized by craft experts from the companies. The training includes learning basic craft techniques, new techniques, as well as how to craft a newly design parts or products. It is very critical for a company to provide continuous training to the villagers to keep a stable workforce enabling them to meet demands from the market.

The study on knowledge transmission in Malaysia is based on the visits to *Kraftangan Malaysia* and four local craft entrepreneurs. Two of the entrepreneurs inherited their business from their family, and the other two craft entrepreneurs received the title *Adiguru* (Master Craftsman) by the government with apprentices working in their workshops. From these visits, the researcher identified three different methods of knowledge transmission. The first method is similar to the conventional method identified in Vietnam: craft knowledge that is passed on from one generation to another. Two entrepreneurs in the state of Perak and Kelantan learned the craft of making traditional pottery from their parents starting when they were young. The second method, also a conventional method (mentioned in 4.2.3), includes the transmission of knowledge based on the master-apprentice approach. In line with the theoretical findings, this conventional method is losing its place in today's societies. Interviews with the *Adiguru* in lion dancing and wood carving mentioned their observation that the master-apprentice method is no longer viable in today's society. The wood carving master mentioned that in the old days, students (or apprentices) were not even allowed to enter the working space unless they were willing to give 100% of their time and attention to the craft. Both masters stressed the importance of sharing the knowledge with the new generations, and both are adapting by exploring new ways of transmitting their knowledge. For example, they are actively involved in craft workshops, demonstrations, talks and lectures in public events, schools, colleges as well as universities. They also accepted various guests, for example, students and researchers to visit or work in their workshops for short or long periods of time. Both masters expressed their interest in exploring the potential of collaboration with design through this research. The third method is a contemporary method in which certified craft programs are offered by the National Craft Institute established in 2001. Prior to its establishment craft programs were organized by Craft Development Center since 1967. Under the wings of *Kraftangan Malaysia*, the institute offers various craft training programs, for example, weaving, pottery, woodworking, rattan, and metal.

	Conventional Method	Contemporary Method
Vietnam	<ul style="list-style-type: none"> • Passed on from one generation to another. 	<ul style="list-style-type: none"> • Training centers in the villages where craft trainings are organized by craft experts from the company.
Malaysia	<ul style="list-style-type: none"> • Passed on from one generation to another. • Via master-apprentice approach 	<ul style="list-style-type: none"> • Programs organized by the National Craft Institute.

Table 6.3: Four methods of knowledge transmission identified in this research.

Table 6.3 displays two conventional methods of knowledge transmission observed in the field: 1) knowledge that is passed on from one generation to the other and 2) knowledge that is transmitted through master-apprentice relationships. The research also identified two contemporary methods in the field: 1) training centers organized by local SMEs and 2) a craft institute endorsed by the government. The contemporary methods highlight a systematic way of knowledge transmission. However, these methods tend to focus mainly on the skills and techniques of crafting as their objective. In comparison, knowledge shared via the conventional methods can be unsystematic yet holistic. Knowledge shared via this method may include cultural aspects such as the local tradition, family histories, local belief, and traditional practices among other things. This suggests the conventional method offers a higher probability of knowledge related to the local cultural heritage to be transmitted.

However, similar to the discussion in subsection 4.2.3, these conventional methods also signify the transmission of craft knowledge in its tacit forms. This situation underlines the issue of the loss of tacit knowledge within the craft domain, underlining the need for articulating the tacit knowledge into explicit forms.

6.1.3 The Influence of Cultural Heritage in Craft Products

In this study, this research observed that craft products in Vietnam and Malaysia are still imbued with elements of local cultural heritage. The discussion in subsection 6.1.1 highlights that the craft industry in Vietnam is comparable to the perspective of craft-as-industry whereas the craft industry in Malaysia is comparable to the perspective of craft-as-culture. In this subsection, the research discusses the influence of local cultural heritage in Vietnam's contemporary craft products and Malaysia's traditional craft products. To explore this context, this research collected different sources of data that lead to the two similar insights (see 3.3.1). The insights from Vietnam are based on site visits, observations on the contemporary craft products available in the international market, and the literature on bamboo craft in Vietnam. In Malaysia the insights were captured based on site visits, interviews with three local craft stakeholders, and discourse at an international roundtable event.

The discussion in subsection 2.1.1 described traditional craft products as products that are closely connected to the people, their surroundings, social contexts, histories, and cultural heritage. These products can be made with the assistance of mechanical systems; however, direct manual contributions of the craft person should still be prominent in the finished products. Contemporary craft products are described as craft products with modern features in which culture-oriented content is used as a creative input in its productions. Although in theory these descriptions are helpful in the construction of this research, situations in the field present more dynamic and complex circumstances.

Traditional Knowledge as a Resource in the Craft Industry

In subsection 4.2.1, this research highlights that local craftspeople are one of the prominent bearers of traditional knowledge. Traditional knowledge, especially those related to the art of making products is one of the primary resources fueling the development of the local craft industry. However, as highlighted subsection 4.5.2, due to factors such as consumers' needs, market trends, companies' brands, and retailers' brand images, less attention is given to the values of cultural heritage embedded in contemporary craft products. In Vietnam, this statement is shown to be true in their contemporary bamboo products. Although traditional knowledge is adopted in the process of producing these products, values of local cultural heritage are almost invisible in the end products available for the consumers. For example, most of the contemporary bamboo-based products only have the tag "made in Vietnam"; retailers hardly mentioned or connect the cultural aspects of the products to their customers. This situation suggests that the craft industry is slowly transforming into standardized industrial practices where the social and cultural influences are at risk of being undermined (see 4.5.2).

Bamboo craft emerged in Vietnam about 1000 years ago in the villages of Thanh Hoa Province (Fanchette & Stedman, 2010, p. 274). Bamboo has a prominent role among the local community touching various aspects of everyday Vietnamese life. Traditionally, bamboo is used to make walls, fences, beds, benches, tables, household items such as rice baskets, as well as agricultural products, for example, farmer's baskets and traps. The knowledge and skills of making these products have existed alongside the establishment of Vietnamese society, and over time this knowledge has become one of the important pillars for the nation's identity and economy (Fanchette & Stedman, 2010, p. 16). The use of this modern-day's sustainable material has long been part of Vietnam's local cultural heritage, and the knowledge associated with this material is embedded within the local craft activities. For example, one will usually find numerous ponds of water in areas where the bamboo is treated. Traditionally, bamboo is soaked in a large pool of water over a period of several months to drown parasites within the bamboo, and to make it more flexible. This process was still in practice during the researcher's visit to Nghe An province. However, the visit also demonstrated the evolution of craft productions to meet the demand of the industry.

For example, local companies are responsible for the supply and processing of raw bamboo into strands used for weaving. These companies are responsible for outsourcing or hiring in-house workers to supply, clean, cut, split, dry, and steam the raw material before distributing the processed bamboo to the villagers. Traditional techniques are still practiced in some of the production processes, especially those that occurred in the villages. However, the overall manufacturing processes managed by the local SMEs also include machines and advanced mechanical supports.

This presents an example of the assimilation between traditional and contemporary knowledge in producing contemporary craft products. Traditional knowledge is embedded in the process of making contemporary craft products and likewise, contemporary knowledge, at times, is adopted in the process of making traditional craft products. This insight is discussed in the next title.

The Line between Contemporary and Traditional Craft Products

Figure 6.8 shows two different types of *songket*—a traditional brocade style fabric in which gold and silver threads are intricately woven with silk or cotton threads. This fabric is traditionally worn by the Malay’s royal and noble families; and also by common people for special events, for example, weddings. The figure shows two types of *songket* which can be found in the market today: a) machine-woven and imported from Pakistan, and b) hand-woven and locally made. The price for a piece of hand-woven *songket* ranges around RM300 to RM1000 while its machine-woven counterpart is priced around RM100 to RM150 a piece. Without an expert’s eyes, it is almost impossible for an average buyer to recognize the difference between these two types of textiles in the market.

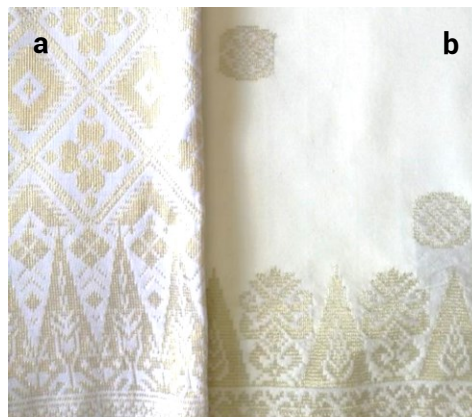


Figure 6.8: Examples of *songket* fabric
a) imported machine-woven and b) local hand-woven.

This is an example of a situation in which traditional craft products that were made using traditional knowledge and techniques are available in the same market as

traditional craft products made using contemporary knowledge and modern manufacturing processes. A similar issue was pointed out during two interviews with *Kraftangan Malaysia's* officers, concerning *batik* fabrics in Kuala Lumpur and traditional pottery in Perak.

Craft entrepreneurs who are practicing traditional skills and using old techniques to craft their products are facing competition from producers who are using contemporary techniques and modern manufacturing processes to make similar traditional craft products. In the case of *batik* fabric, the officer highlighted cases where sellers adopted the higher price of hand-made *batik* textiles for machine-made pieces. In the pottery community, more craft entrepreneurs chose to discontinue using traditional techniques and opt for more effective modern manufacturing. For example, most potteries are made using the casting technique in place of the traditional pinching and throwing techniques. The traditional way of firing to obtain a traditional black-luster finish is now often replaced with spray paint. Even though there are craft entrepreneurs who are still invested in the traditional knowledge and techniques, their choices are limited due to the need to remain competitive in the market. During the roundtable 'Cloth, Culture, and Development' organized by International Institute for Asian Studies (IIAS) in Chiang Mai, the researcher came across similar challenges faced by traditional textiles producers in Thailand. This issue was raised during the second session titled 'Parameters of Market, Raw Materials, Design, and Technology' that highlighted the challenge in which traditional hand-woven textiles and machine-made textiles were sold side by side with the same price. The panels and audiences discussed this issue based on aspects relating to authenticity and commercialization of craft products (Arkaraprasertkul, Southard, & Kloppenborg, 2014).

At a glance, the machine-woven *songket* can be considered as the result of a derivative driven by commercialization while the hand-woven *songket* is the original or authentic one. However, the line between contemporary and traditional craft products is not as straightforward because there are more than methods of construction when it comes to products that are connected to the local cultural heritage. For instance, even though machine-woven *songket* fabrics are no longer made using traditional techniques, these items still offered traditional meanings that are collectively shared among the Malay communities. These fabrics adopted the traditional motifs and are used by local people during weddings and other cultural activities. This means that the fabric still offers similar cultural interactions while providing an affordable choice for the middle and low-income group to don a traditional textile, therefore, keeping part of their cultural heritage alive. The dynamic and complexity of the influence of cultural heritage on craft products highlights the importance of understanding the composition of values inherent within traditional and contemporary craft products by both the producers and consumers.

6.1.4 Conclusion

This section presents an overview of the craft industry in Vietnam and Malaysia and underlines two craft perspectives that can be used to describe the context of craft in each country. Based on the two craft events visited, this research perceived that the perspective of craft-as-industry is prevalent in Vietnam whereas in Malaysia craft-as-culture is dominant.

The study suggests a growing interest among local craft stakeholders in the design process. However, their involvements in the product development process had been limited to the crafting process (i.e., prototyping and producing). Furthermore, it is common for designers working with the local craft organizations to adopt culture-oriented content in the product development process. This finding is comparable to the discussion in section 4.5 and presents the opportunity for local craft stakeholders to offer their knowledge and experience about the local cultural heritage, specifically on traditional craft products in the design process. This opportunity presents a platform for local craft stakeholders to collaborate in the product development process in an inclusive and equitable way: by identifying and articulating knowledge within their domain that can be useful in the process.

This insight presents a context as well as an opportunity to conduct the design workshop developed in this research. By conducting the design workshops, the research aims to include local craft stakeholders in the fuzzy front end of the product development process and examine the exchange of knowledge and interactions between the craft and the design domains (**P1a**). The implementation of the design workshop also allows the research to examine the potential use of heritage products as a creative resource in generating new product ideas (**P3a**).

This study also identified that knowledge within the craft domain, especially those linked to the intangible cultural heritage is still transmitted via socialization, in which knowledge remains in tacit forms (see 4.2.3). Therefore, the adaptation of externalization, in which tacit knowledge is transformed into explicit forms (see 4.2.3) can be useful, as explicit knowledge can easily be shared and disseminated to outsiders. Further in this research, this explicit form of knowledge is used to elicit elements of sustainability inherent within heritage products (**P4a**). Another aspect identified is the dynamic and complexity in understanding the influence of cultural heritage within today's craft products. This finding presents the future use of exploring and identifying the composition of values inherent within heritage products (**P2a**). During the implementation of this study, the researcher also scouted potential stakeholders to participate in the design workshop. Interest and positive feedback received from the craft stakeholders on the design workshop highlighted their growing interest in the design process. In the following section, this research presents the criteria, selection, and a brief overview of the case studies conducted in this research.

6.2 Implementation of the Case Studies

This section summarizes what is proposed in the research and what happened in the field. This topic is mentioned in subsection 3.3.2 highlighting the discrepancies between the design intervention requirements and the findings from the General Descriptive Study. This section begins with how potential stakeholders were scouted and invited to participate in the design workshop. The research also revisits the criteria established in selecting the participants and initiating the design workshop. Next, it discusses the research design and aspects that were adjusted based on the context in the field. Then, the chapter presents a brief overview of all the case studies conducted in Vietnam and Malaysia followed by a flow diagram outlining three different implementation stages: Preliminary, Primary, and Verification.

6.2.1 Selecting and Implementing the Case Studies

As highlighted in the previous section, apart from building an understanding of the existing situation, the General Descriptive Study also provided the platform to initiate the case studies. Every case study is considered as a unit in this research, and each comprises two-points of explorations (see 3.2):

- *Specific Descriptive Study*—where the research established an understanding of the background and context of the participants as a basis for structuring a design workshop.
- *Design Intervention*—part of a design workshop where the process of exploring heritage products is adapted as one of the creative inputs in the product development process.

Selecting Participants for the Case Studies

Since this research relied on voluntary participation, the main driver for local stakeholders to participate in this research was their interest in developing new product ideas. However, as the situation in the field was influenced by other external factors, such as time, resources, and stakeholders' availability, not all the criteria stated in subsection 5.1.1 were met in the case studies conducted in this research. Table 6.4 exhibits the criteria that were met in all case studies, adjusted to meet the context in the field, and met in some of the case studies.

Once stakeholders meeting these criteria (or part thereof) are found, the researcher sends an invitation for a meeting with the interested stakeholders. During this meeting, the researcher presents a general overview of the research and the basic concept of the design workshop. The researcher also probes for the stakeholder's interests and motivation to participate in the design workshop. When a potential stakeholder agrees to participate in the research, the researcher took the responsibility to schedule a design workshop in which a combination of the design intervention sessions is structured to meet the participants' needs and constraints. When the

schedule and structure of the design workshop are agreed upon, the design workshop is implemented.

Criteria	Additional Notes
<p>Criteria met in all case studies.</p> <ul style="list-style-type: none"> ● Craft domain representatives: <ol style="list-style-type: none"> a. Local craft stakeholders who are economically reliant on the productions of craft products with traditional characteristics. <p>or</p> ● Design domain representatives: <ol style="list-style-type: none"> a. Local design stakeholders with experience the industrial design field or formal design education background. ● Heritage Products: <ol style="list-style-type: none"> a. Part of traditional folkcrafts or everyday objects. 	<p>All the craft stakeholders observed and interviewed in this research are involved in craft products with traditional values embedded.</p> <p>As the design domain is not an integral part of the local craft industry, it was difficult for the researcher to find local designers who can work or engage with local craft producers. To manage this circumstance, this research worked with design representatives that are part of the local organizations that meet this criterion⁸.</p>
<p>Adjusted criterion (met in all case studies)</p> <ul style="list-style-type: none"> ● Representatives who inherited their craft knowledge from the previous generations 	<p>This criterion was adjusted due to the situation in Vietnam where the local SMEs instead of the craftspeople are the stakeholders involved in the product development process. These companies serve as</p>

⁸ This decision is in line with the Bricolage principle (see 3.2.2) which highlights the efficient use of existing resources and capabilities in initiating the design workshop. Corresponding to the situation in the field, the research engaged with design representatives that are connected to the local organizations, had experience working in the local craft domain, and are interested in the link between design and cultural heritage.

	agents that connect the craftspeople to the market. As interest in the product development process is fundamental, the research focused on participants that inherited the selected heritage products instead. This criterion is applied to both craft and design representatives. Following this adjustment, at least one (or more) of the participants involved in the design workshop need to be the inheritor of the selected heritage products. An inheritor is someone who has experiences or learned about the selected heritage product from the previous generations (e.g., families, local communities, or the general society).
<p>Criterion met only in some case studies</p> <ul style="list-style-type: none"> ● Collaboration efforts between representatives from the craft and design domains. 	As this criterion is critical for P1a , only case studies that met this criterion will be used in the analysis related to this proposition.

Table 6.4: The criteria in relation to the implementation of the case studies.

One of the challenges faced in implementing the design workshop was scheduling. Since the design workshop is structured for 3 to 4 days, it is important to get an early confirmation from the local craft producers to minimize the impact on their everyday activity. For instance, even when the schedule and dates of a workshop have been agreed upon interested stakeholders may withdraw from the research due to various reasons. As their participation is voluntary, it is natural that their priority lies in their day-to-day business activities. For example, a local SME in Vietnam had to withdraw as they received an unexpected order from a client and a design workshop in Malaysia could not be initiated due to conflicting schedule even though the craft entrepreneur was interested in participating in the case study.

Implementing the Case Studies

The general descriptive studies and the establishment of the criteria for the design workshop presents the preparations and activities that preceded in finding relevant and interested stakeholders to initiate the case studies. The initial groundwork included site visits, interviews and meetings with interested stakeholders, as well as creating proposals for the design workshop took the majority of the time during the fieldwork. These activities had also built the informal but essential social network required to initiate collaborative efforts with local craft stakeholders in the field. Four out of seven local organizations agreed to be part of the research, providing two design representative from Vietnam and twelve (four designers and eight design students) from Malaysia. Next to this, seven out of eight local craft producers contacted expressed their interest to participate. However, due circumstances like those mentioned above, only two out of four local SMEs in Vietnam and three out of four

craft entrepreneurs in Malaysia participated in the case studies. Figure 6.1 illustrates the connections between these participants and the six case studies conducted in this research.

6.2.2 Overview of the Case Studies

Figure 6.9 presents the overview of six case studies conducted in the North of Vietnam and Peninsular Malaysia from May 2012 to August 2014. The figure shows the place, types of material used by the craft representatives, a target market for the new product ideas, the number of representatives from craft and design domains participated in the design intervention and the outcomes of each case study. From the figure, it can be seen that three case studies have been conducted in the northern provinces of Vietnam; Nghe Anh, Hanoi, and Ha Nam. The other three case studies from Malaysia were conducted in the state of Perak, Selangor, and Kelantan.

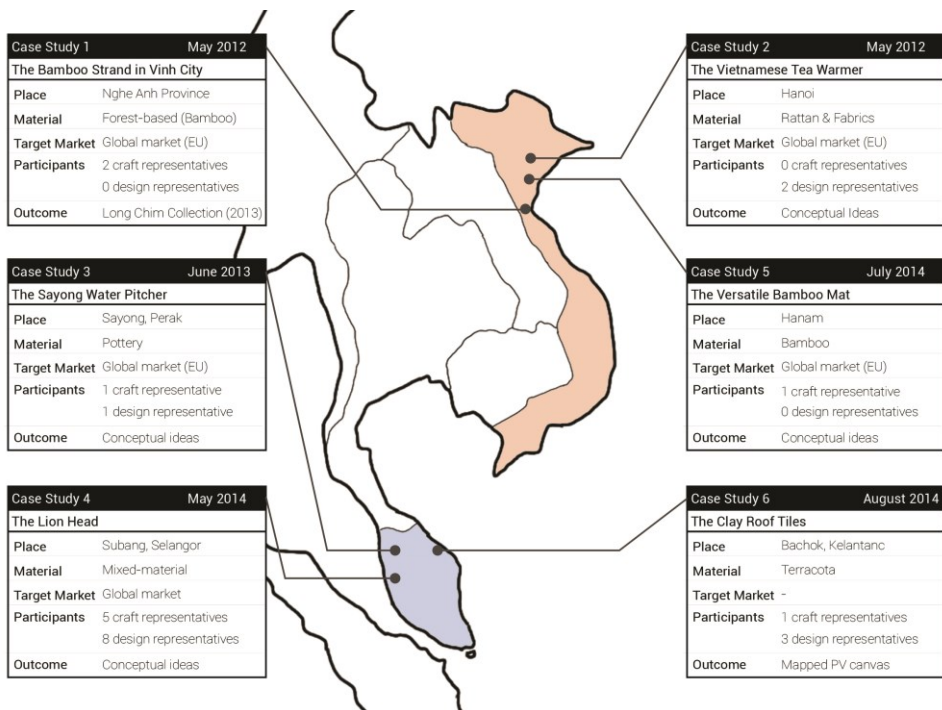


Figure 6.9: General overview of the six case studies conducted in Vietnam and Malaysia.

In essence, all the case studies were constructed differently based on the interested stakeholders, the availability of the participants, as well as their requirements and constraints. Although the number of participants and representatives from the craft and design domains varies between cases, the three design intervention sessions (see 5.2) were conducted using the same methods. These case studies were implemented in three stages: preliminary, primary, and verification (Figure 6.10).

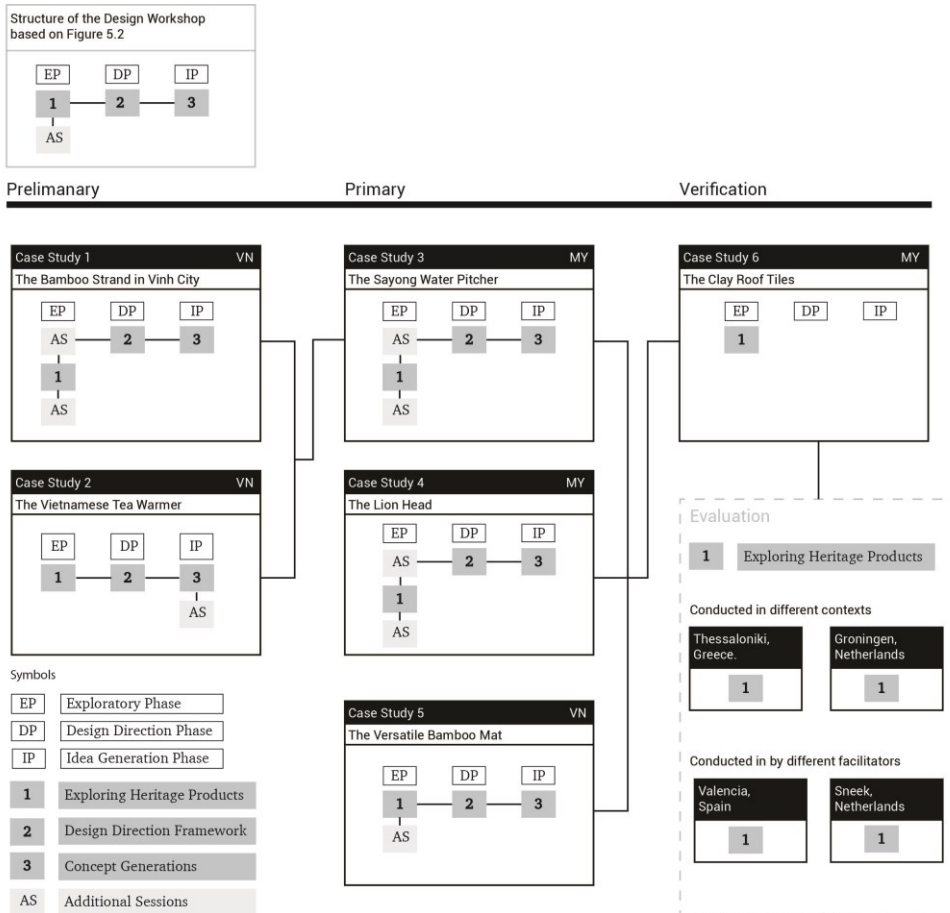


Figure 6.10: Stages of Implementation for the case studies.

Preliminary Case Studies

There are two case studies conducted in this stage. Case Study 1 and 2 were conducted as part of the researcher's MSc graduation project (Suib, 2012). The implementation of these two case studies provided insights toward the establishment of the design intervention sessions as a design workshop (shown in Figure 5.2). Initially, two different structures of the design workshop were developed. In the first structure, the additional sessions (in light gray boxes) were conducted as part of the exploratory phase. In the second, these additional sessions were conducted after the *Idea Generation* session. As the results, concepts generated in Case Study 1 were incremental as it was confined by participants' production capability and marketing strategy. In Case Study 2, by contrast the participants indicated that the concepts developed were radical with no clear ownership of the outcomes. Based on its feasibility, adaptability, and direct benefits to the representatives (in which the concepts can be directly developed further) the research had chosen the structure from Case Study 1 to be implemented in the next stage.

Primary Case Studies

Using the structure of the design workshop shown in Figure 5.2, this research planned to conduct two case studies in Vietnam and two in Malaysia. However, due to unforeseen circumstances only one case study was conducted in Vietnam as one of the companies that agreed to participate in the workshop had to withdraw. Furthermore, as shown in Figure 6.6, the combination of design intervention sessions conducted in the Exploratory Phase was different between these cases. These different combinations occurred because each case study had specific design objectives. For example, Case Study 3 aimed to penetrate into a new market whereas Case Study 5 focused on expanding the current market. These objectives lead to different design considerations; hence, different types of design sessions were structured in the Exploratory Phase. However, these adjustments only affected the additional sessions. The three design intervention sessions (in dark gray boxes) were still conducted in all case studies. The modular aspect of the design workshop was useful in managing these changes. Furthermore, this adjustment indicated the discursive nature of the session *'Exploring Heritage Products'* as it can be conducted successfully in all case studies (indicating dependability: see 5.3.1), proving it to be relevant and useful in the design process, and independent of the other sessions structured in this research.

Verification Case Studies

This case study was conducted as a means to corroborate findings from the Primary Case Studies. In this stage, this research only focused on the implementation of *'Exploring Heritage Products'*. This research conducted another case study in Malaysia (Case Study 6) as a verification case. Based on insights captured from Case Study 4, *'Exploring Heritage Products'* session was conducted in a craft environment instead of the typical office setting. As part of the efforts to ensure the transferability of the method (the session's tools and setup, see 5.3.1), this particular session has been tested further in two different settings by the researcher (in Thessaloniki, Greece and Groningen, the Netherlands) as well as in two projects by other facilitators (in Valencian, Spain and Sneek, the Netherlands).

The following section presents the descriptions of the case studies which include stakeholders' motivations, the process, and outcomes of the design workshop, specifically of the session *'Exploring Heritage Products.'* The background context of each case study can be found in Appendix 5.

6.3 The Case Studies

This section presents the descriptions of six case studies conducted from 2012 to 2014. As illustrated in Figure 6.9, three case studies were conducted in Vietnam and three were conducted in Malaysia. Each case description includes a brief introduction about how the case study was initiated followed by the structure of the design workshop, and a detailed description of the session: *Exploring Heritage Products.* Detailed

descriptions of this particular session are important as the session serves as the main platform to collect primary data used in the following chapter. The case studies are presented according to the implementation stage (Figure 6.10) and a summary of relevant findings is included at the end of each stage. Appendix 5 supplements the case studies' description with the background context of participants. In Appendix 6, the research includes narratives about all the heritage products explored in this research. Each narrative has been constructed based on the statements extracted from the PV canvases.

6.3.1 Preliminary Stage: Case Study 1

Bamboo Strands from Vinh City

The case study was initiated through the connection made during Lifestyle 2012 between the researcher and PCD's director Mr. P who wanted to grow from a capacity-based-producer to a design-based-manufacturer. Their products were targeted toward the low to middle-end market which means that these products are low in prices and high in volume. However, the competition was strong among local producers in this particular market segment. Besides, Mr. P was inspired to develop PCD's product collections from his experiences working with international clients, visits abroad, and observations in local and international trade fairs. Based on the company's experience and capability, Mr. P was convinced that this idea can be achieved. This perspective influenced his decision to participate in the research and the design workshop was structured with the aim to support PCD in developing their first product collections aimed for the European middle market.

The Design Intervention Sessions

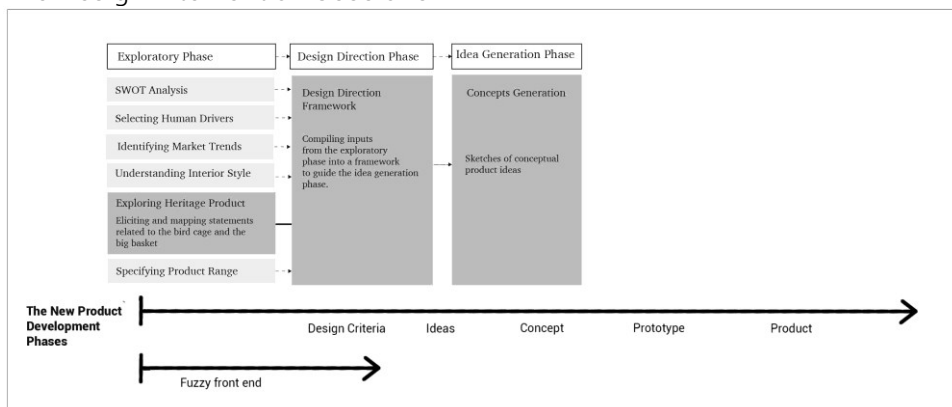


Figure 6.11: Structure of the design workshop—Case Study 1.

Figure 6.11 illustrates the design workshop structured for this case study. This three-day workshop was attended by two staff from the company, Mr. B, the Deputy Sales & Production Manager and Mrs. H, the Import & Export Executive. The workshop started with an introduction of the research and examining the PCD current strengths,

weaknesses, opportunities, and threats (or SWOT Analysis). This session was followed by five other sessions within the Exploratory Phase: 1) Exploring Brand Values, 2) Identifying Market Trends, and 3) Understanding Interior Style, 4) Exploring Heritage Products, and 5) Specifying Product Range.

The outcomes of these sessions were compiled to build a design direction for the collection. The content mapped onto the Design Direction Framework was used to guide the participants in generating new product ideas. By the end of the Idea Generation session, 18 concepts were created based on four product ranges: lighting, vases, picture frames, and candle holders. The company continued to develop 4 of these product ideas further. The prototypes developed from the result of this workshop were exhibited in Ambiente 2013 in Frankfurt. With the support from the researcher in the following year, the company continued to develop a collection called *'Long Chim'* (Bird Cage) which was launched in LifeStyle, 2013, Ho Chi Minh City. Figure 6.12 presents an overview of the workshop and the exhibitions.

Exploring Heritage Products: The Bird Cage and Big Basket

As this is the first session conducted to explore heritage products, the research pre-selected four different heritage products from Vietnam Museum of Ethnology in Hanoi (Figure 6.13): tray, household basket, pillow, and birdcage. The participants selected two heritage products for this session—birdcage and household basket. These selections were made because both participants have personal relations and experiences to these products. Mr. B mentioned that he keeps a few birds within the factory compound. Next to this, both participants agreed that the household basket was commonly used as a container to collect tools by the local farmers.

Once the heritage products were selected, the researcher gave a brief introduction about the MPV model and how to map the product values onto the PV canvas. The researcher took an active role as a facilitator in this session; asking questions and supporting the participants in mapping the experience and knowledge shared about the selected heritage products. This support was required since both participants were not familiar with working in a creative setting. The session was conducted in PCD's meeting room and lasted for 90 minutes. By the end of the session, a total of 31 statements were mapped onto the canvas with 19 statements for birdcage and 12 statements for the farmer's basket. Table 6.5 presents the number of statements mapped according to layers of the MPV model. The session ended with a discussion about both heritage products, and the participants were asked to select three statements from each heritage product. These statements were mapped onto the Design Direction Framework in the following session.



Figure 6.12: Overview of the workshop and the exhibitions.



Figure 6.13: Selection of the heritage products and the outcome of the session.

Layers	No. of Statements	
	Bird Cage	Big Basket
Aesthetic	4	3
Interaction	3	2
Performance	3	1
Construction	6	3
Meaning	3	3
Total	19	12

Table 6.5: No. of statements mapped onto the PV canvas in Case Study 1

Feedback and Insight

The feedback received from the participants highlighted the importance of introducing a holistic overview of how the intervention sessions were connected to each other. According to the participants, the session 'Exploring Heritage Product' was confusing because they did not understand why and what is the relevance of exploring these traditional products in developing new product collection. However, things started to make sense in the Design Direction Phase when they put all the outcomes from the Exploratory Phase together. The 'mix and match' process (the term used by the participants) provides a straightforward approach and basic understanding about what the new collection is about.

Apart from the feedback from the participants, this research identified that selecting two heritage products to be explored influenced the focus of discussion. During the session, the discussion kept going back and forth between the birdcage and the household basket. Choosing only one heritage product can improve the focus of the session and indirectly generate a more in-depth knowledge of a selected heritage product. Another takeaway from this session was how to select a heritage product. It was evident from this session that the participants have a better understanding of heritage products that are relevant to their context and these products are not necessarily found only in museums. In the next case study, the researcher no longer pre-selected heritage products. Instead the participants were asked to select a heritage product.

6.3.2 Preliminary Stage: Case Study 2

The Vietnamese Tea Warmer

This case study was initiated with the collaboration of two designers from Vietnam, Miss G and Miss C who were working in the Green Office (GO), Hanoi. GO is part of the Sustainable Product Innovation in Vietnam, Cambodia, and Laos (SPIN-VCL) funded by SWITCH-Asia. The project focuses on sustainable product designs as the catalyst for innovation contributing to the improvement in industry, society, and the environment (Jansen & Crul, 2012). The craft industry is one of the target sectors in this project. Within the context of the SPIN project, the two designers are responsible for developing new product ideas for local SMEs, especially within the craft sector. This role required them to visit local craft companies, discuss and share their ideas with local craft producers, and share their knowledge about sustainable product innovation with local stakeholders. In brief, they are considered the trainers or consultants who are involved in building the local capacity in the area of sustainable product innovation. This case study was conducted as part of the MSc Graduation Project of the researcher (Suib, 2012) with the aim to support SPIN's designers to generate sustainable product concepts and its potential to be implemented with potential partners.

The Design Intervention Sessions

Figure 6.14 illustrates the overview of the design intervention sessions structured in this case study. As mentioned in subsection 6.2.2, this design workshop was structured differently than in the first case study as the participants were part of the organizations providing design supports to local craft producers. This workshop aimed to support the participants to explore various sustainable product ideas and identify the different forces (namely, the market, industry, and people) that need to be understood to support the development of these ideas. The workshop began with an introduction of the general idea of this research: to adapt heritage as one of the creative resources in the product development process. Specifically, the workshop focused on developing new product ideas based on sustainable elements inherent within a heritage product. Next, the session Exploring Heritage Products was conducted. By the end of this session, the participants were asked to identify and select statements (mapped onto the PV canvas) that are connected to elements of sustainability. As both participants were part of the SPIN project, their training and experiences ensure that both have a sound understanding of the different aspects related to sustainable product innovation. Thirteen out of fifty-two statements were identified as connected to the elements of sustainability. These statements were the only content mapped onto the Design Direction Framework.

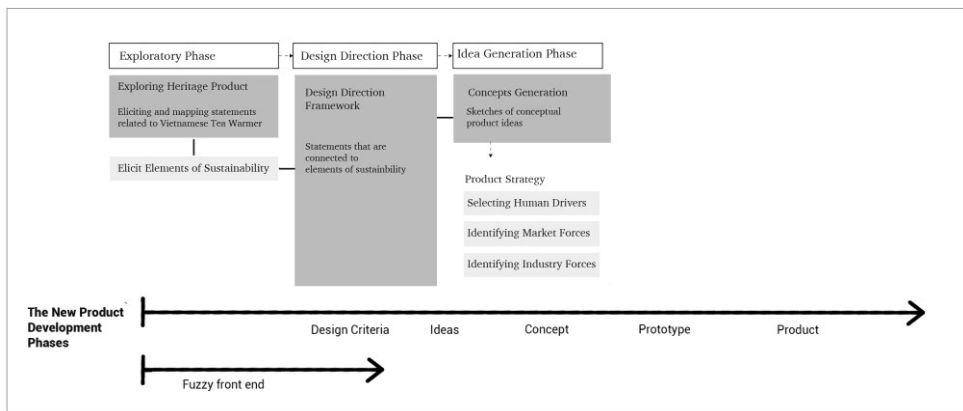


Figure 6.14: Structure of the design workshop—Case Study 2.

During the Idea Generation session, these thirteen statements served as the reference point for the participants to generate new product ideas. By the end of the session, 22 product ideas were generated, and three ideas were selected to be explored in the next phase called Product Strategy. This phase consisted of three additional sessions: a) Selecting Human Drivers, b) Identifying Market Forces, and c) Identifying Industry Forces. These additional sessions provide different perspectives on the evaluation of the product ideas, providing a means for participants to develop a product proposal to be shared with local craft stakeholders.

In principle, these sessions aimed at supporting the process of exploring new product ideas by evaluating where and how each concept can potentially be positioned within a particular market segment. Figure 6.15 presents the overview of the design workshop. Although the core structure of this design workshop was different than the Case Study 1 the setup and tools used for Exploring Heritage Products session were similar to the method presented in subsection 5.2.1.



Figure 6.15: Overview of the workshop.

Exploring Heritage Products: Vietnamese Tea Warmer

The session began with a brief introduction about the five layers of product elements and how to map the values identified onto the PV canvas. Next, the participants were asked to select a product that can be linked to their cultural heritage. After a brief discussion, both participants agreed to use 'Am Gian Tich' or Vietnamese Tea Warmer (Figure 6.16) as this traditional product is prominent in Vietnam. It is well-known known among their families, local peers, and communities as it has been part of Vietnam society for generations. This tea warmer was also available in GO office

suggesting that it is still a functional item among their colleagues. Figure 6.16 presents the selected heritage product and the mapped PV canvas.

After the selection of heritage product, the researcher prepared the tools for the session: the PV canvas, sticky-notes, and markers followed with a brief reminder about the PV canvas. Then the participants proceeded with the session, discussing and sharing their knowledge and experience related to the tea warmer based on the five layers of the MPV model. At the beginning of the session, the participants were advised to explore the PV canvas, one layer at a time. For instance, the discussion starts from the Aesthetic layer and towards the Meaning layer. However, as the session progressed, this approach became a barrier as the participants began to share their knowledge, experiences, and stories which comprised of a mix of statements that can be mapped onto different layers. After a short exchange with the researcher, the participants mapped relevant statements onto the layers interchangeably as the session progressed. Each identified statement was written on sticky-notes and mapped onto the canvas.



Figure 6.16: The heritage product and the outcome of the session.

The session was conducted in the GO office and lasted for 90 minutes. By the end of the session, 52 statements were mapped onto the PV canvas. The distribution of statements in each layer is shown in Table 6.6. The researcher took a passive role in this particular session. This means that she was only involved in giving the introduction at the start of the session and was present to react to any questions regarding the process. She was not engaged in discussion, elicitation or mapping the statements onto the canvas. By the end of the session, the participants gave a short presentation about the result, followed by a brief discussion of the statements that were selected as part of the elements of sustainability associated in a product.

Layers	No. of Statements
	Tea Warmer
Aesthetic	5
Interaction	12
Performance	13
Construction	13
Meaning	9
Total	52

Table 6.6: No. of statements mapped onto the PV canvas in Case Study 2.

Feedback and Insight

The feedback received from the participants indicated that exploring the heritage product helped them to generate ideas. However, although some interesting concepts were generated during this workshop, it was a challenge for the participants to identify companies that can develop these concepts because without a specific company, the exploration of the forces of the market, industry, and people can be shallow. As the concepts generated from this session can be considered radical in the craft context, it might also be difficult to find local SMEs that are willing to explore these concepts further. In addition, introducing such a concept may require certain capacities that are not available within a company.

Following the insights from the previous case, only one heritage product was explored and the participants selected the heritage product for the session. This research also identified the benefits of having the actual product be present—not just a representation of the product. Having the physical product during the session offers various interaction and experience opportunities for the participants. Another takeaway from this session was that the knowledge, experiences, and stories shared about the heritage product are not necessarily specific to each layer. Instead, a story may comprise various statements relevant for different layers. This highlights the discursive nature of the layers of the MPV model and indicates the importance of capturing the content of discussion from the session and mapping them according to the layers in the PV canvas.

6.3.3 Preliminary Stage: Summary

In essence, the findings from these two case studies support the development of the design workshop introduced in Chapter 5, which has been established based on the structure of the design workshop in Case Study 1. This structure was implemented in the Primary stage. Apart from this, the findings from this stage also present some aspects of the design intervention session that need to be improved, especially the session ‘Exploring Heritage Product.’ In the next case study, the participants are required to select only one heritage product. The research recommends that the actual product be present—not just a representation of the product. Participants should know that they can explore the different layers of the MPV model without any restrictions. However, during this exploration, the facilitator needs to remain attentive in reminding and supporting the participants to capture the points of each exchange and mapped these as statements onto the PV canvas. Finally, the session ‘Design Direction Framework’ (based on Case Study 1) and ‘Concept Generation’ (based on Case Study 1 and 2) managed to be conducted without any major issues thus the research continued to use the same setup and tools in the next case study.

6.3.4 Primary Stage: Case Study 3

The Sayong Water Pitcher

This case study was initiated through the support of *Kraftangan Malaysia* regional office in the state of Perak which has been established to support and monitor local craft business and its development. Through the support of both *Kraftangan* headquarters and its Perak regional office, a local craft entrepreneur, Mr. F, and an in-house designer, Mr. R, from *Kraftangan Perak* were invited to participate in the design workshop. As an in-house designer, Mr. R’s roles involve developing new product concepts for productions and exhibitions, building and testing prototypes in *Kraftangan’s* workshops, and working together with local craft producers to develop new products and improve their production and work efficiency. The craft entrepreneur, Mr. F, is a local native who inherited his craft business in the village of Kepala Bendang in Sayong. Apart from traditional pottery style, he also has the skills and capacity to produce ceramic-based products. However, it is a challenge to penetrate into the ceramic market due to the competition among local as well as international producers who have established their positions in the market. One strategic direction identified during the initial meeting to organize the design workshop was expanding his product portfolio. This expansion will focus on developing a product collection based on his strength and capabilities in both traditional pottery and ceramic making. This direction also suits the organization’s aim to support the development of the local craft products and afforded the opportunity for both parties to work together. Hence, the design workshop was structured with the aim to support the development of a sustainable product collection based on a

traditional water pitcher unique to the Sayong area while taking into consideration the traditional black-firing technique and raw material that is locally excavated.

The Design Intervention Sessions

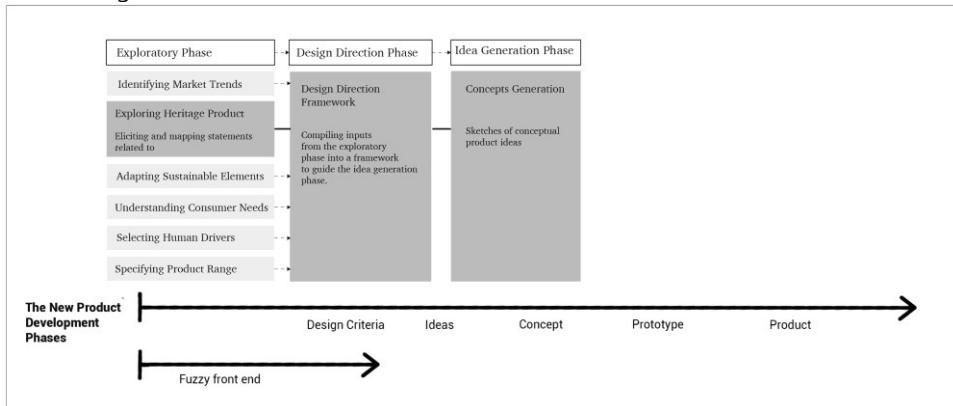


Figure 6.17: Structure of the design workshop for Case Study 3.

Figure 6.17 illustrates the design intervention sessions structured for the design workshop in this case study. The three-days design workshop was conducted in Kraftangan Perak office located 14 kilometers from Sayong. The workshop began with an introduction of the research and establishing the foundation of understanding between the participants and the researcher. Next, the session examined and analyzed the current situation of Sayong craft industry using *SWOT Analysis*. This was then followed with five other sessions conducted for the Exploratory Phase: 1) *Identifying Market Trends*, 2) *Understanding Consumer Needs*, 3) *Adapting Sustainable Design Elements*, 4) *Exploring Heritage Products*, and 5) *Specifying Product Range*. Next, during the *Design Direction Framework*, the participants were asked to compile the results from the Exploratory Phase on an A1 paper, and this outcome was put on the wall. In essence, this outcome represented the framework for their design direction and was used as a guideline in the following session—*Idea Generation*.

During the *Idea Generation* session, the brain-sketching activity was performed in two segments with three cycles each. Six different product ranges were explored in these two segments: lighting, vase, planting pot, fruit bowl, water bottle, and water pitcher. A total of 18 concept ideas were generated with 3 concept ideas for each product range. By the end of each cycle, the participants presented their ideas to the group. Next to this, two additional sessions were conducted after the Idea Generation session to redefine the current business model and to build a roadmap illustrating the timeline for concepts refinement, prototyping and product launching. Figure 6.18 presents an overview of these sessions.



Figure 6.18: Overview of the design workshop.

Exploring Heritage Products: Sayong Water Pitcher

In this session, the selection of the heritage product—the *Labu Sayong*—comes naturally as the water pitcher is a well-known representation of Sayong’s culture, heritage, and local identities. It is also directly connected to the craft representative, Mr. F, who grew up in the village known for crafting this heritage product. He mentioned that the art of making *Labu Sayong* is embodied within his family, the community, and the village; this inevitably binds him to the craft. Mr. R highlighted that this particular heritage product plays a significant role in the development of the

craft industry in Sayong as well as its local community. Figure 6.19 shows the *Labu Sayong* and the outcome of this session.



Figure 6.19: The heritage product, Labu Sayong, and the result of the session.

The session began with an introduction of the MPV model and the PV canvas. The researcher prepared the PV canvas on an A1-sized paper, and provided markers and sticky notes before the session began. The researcher took the role of the facilitator in the session as both participants are well versed on the topic. The craft representative, Mr. F is an expert when it comes to *Labu Sayong* and the design representative, Mr. R is an expert on design and pottery making in general. This combination resulted in a lively discussion about the *Labu Sayong* as both exchanged knowledge from design and traditional craft perspectives. However, as both participants are not accustomed to mapping their discussion on sticky notes, the researcher supported this process by clarifying the points of knowledge shared during the session and mapping them according to the layers based on the inputs and advice from the participants. The exploration lasted for about 90 minutes, resulting in 37 statements. Table 6.7 presents the distribution of the statements according to the layers. At the end of the session, the participants gave a short presentation to Mr. B, the director of Kraftangan Regional Office (Perak) followed by a discussion on the interesting statements selected and mapped onto the Design Direction Framework.

Layers	No. of Statements
	Tea Warmer
Aesthetic	6
Interaction	4
Performance	5
Construction	10
Meaning	12
Total	37

Table 6.7: No. of statements mapped onto the PV canvas in Case Study 3.

Feedback and Insight

This case study is the first case that included the participation of craft and design representatives. It is interesting to note that during the session *Exploring Heritage Products* both participants had different perspectives on the selected heritage product. For example, Mr. R shared his understanding about the water pitcher based on the design principle of ‘form follows function’ in which he explained that the shape of the gourd makes the water flow in two levels thus reducing the chance of overflow. In response, Mr. F shared that in the old days the water pitcher was made from pumpkin gourd (which explained the name *Jabu* which means ‘pumpkin’ in the Malay language). Such discussion and information create a meaningful knowledge exchange between participants during the session.

However, experience from this session highlighted the importance of eliciting and mapping the knowledge shared during the session. As a facilitator, the researcher needs to remind participants to map their exchange regularly but at the same time making sure it does not disrupt the flow of the discussion. This issue remained to be one of the challenges in this research as the content mapped onto the PV canvas only represents the surface of the richness of knowledge shared during the session. Also, Mr. F remarked that the setting of the design session’s environment reminded him of his school days suggesting the space used for the session is foreign to the craft representative. This insight influenced the selection of space in the following case study where the researcher took the opportunity to conduct ‘Exploring Heritage Product’ session in a familiar space for the craft representative—the workshop.

6.3.5 Primary Stage: Case Study 4

The Lion Head

This case study was initiated with the help and support from Mr. L, the head of the Industrial Design program in a design and art institute located in Kuala Lumpur. He was pivotal in connecting this research to a lion dance troupe based in the north of Shah Alam, Selangor. He was also present during the introduction meeting with the head of the troupe or the master—Sifu S. With 40 years of experience, Sifu S is a prominent figure in the local as well as international arena of lion dancing. Under his guidance, the lion dance troupe is also responsible for making the intricate lion head costume for their performances as well as for other interested clients.

In the first meeting, the researcher presented the summary of the research, shared the objective of the design intervention sessions with the aim to invite Sifu S and his troupe to collaborate in the case study. During the meeting, Sifu S was not particularly interested in expanding their product portfolio as the troupe’s main aspiration lies in the dance performance itself. Therefore, developing new products ideas were not within their scope of interest; however, they are interested in sharing their knowledge and willing to work together with the institute. For the lion dance troupe, sharing their

knowledge and experiences constituted a way to keep this traditional craft alive. Despite their busy schedule, the troupe members seem open and welcoming to outsiders interested in learning about this particular cultural heritage. As Sifu S mostly speaks Mandarin, Mr. L also acted as the translator for the meeting. The meeting provided an understanding of the motivations for the troupe to participate in the design intervention session which had a significant influence on the overall structure of the design intervention framework (Figure 6.20).

The Design Intervention Sessions

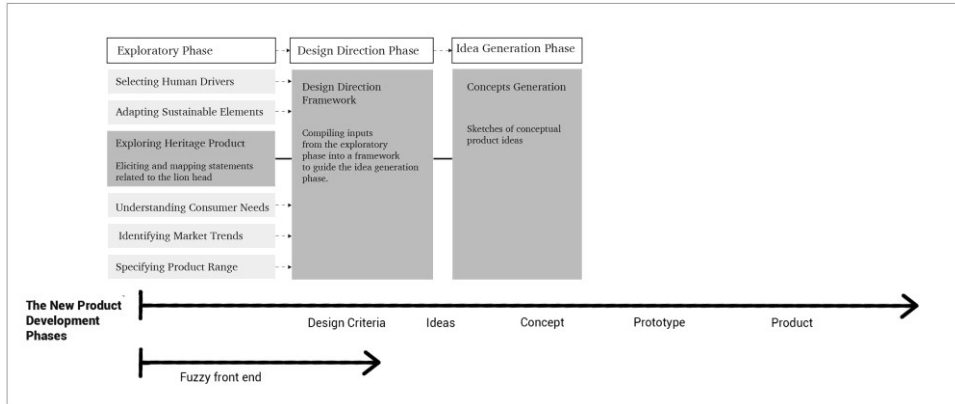


Figure 6.20: The structure of the Design Workshop for Case Study 4.

The design workshop was structured as part of the institute’s Minor Design Project course which involved the participation of eight industrial design students from the diploma program. This course aims to provide a platform for students to learn and gain hands-on-experience through collaboration with experts and stakeholders from the industry. In response to this collaborative effort, the design brief for the project required the students “to design a functional home decor item in consideration of market trends, product emotions, and the heritage values of the lion dance costume.” Altogether, the troupe’s passion in sharing their knowledge and the student’s coursework requirements generated the opportunity for a collaborative effort to explore the elements related to the traditional art of lion dancing. The students were divided into two groups of four and worked together throughout all the sessions in the design workshop as illustrated in Figure 6.20. The troupe, however, only participated in the session of *Exploring Heritage Products* mainly because the objective of this session fits to their interests and the limited time available for them to participate in design workshop. Different to the previous case studies, this particular session was conducted in the craft workshop while the remaining sessions were carried out in the institute.

Eight design intervention sessions were conducted within three days. The researcher started the first day with a brief introduction about the research to the students, followed by a short ice-breaking activity to warm up and get to know each other

better. Then, two of the sessions from the Exploratory Phase were performed: 1) *Selecting Human Drivers* and 2) *Adapting Sustainable Elements*. In the second day, the students, their lecturers, and the researcher went to the craft workshop for the session *Exploring Heritage Products*. As mentioned earlier, this session is the only sessions in this case study that involved the participation of the troupe and will be presented in detail in the following title. The third day started with a short presentation by each group about their mapped PV canvas, five interesting statements extracted from the canvas, and sharing some experiences from the previous day. Next, three more sessions from the Exploratory Phase were conducted: 1) *Understanding Consumer Needs*, 2) *Identifying Market Trends*, and 3) *Specifying Product Range*. Then, each team built their design direction based on the results generated from all the sessions conducted in the Exploratory Phase.

Once their *Design Direction Framework* was completed, the students sat together with their group and the *Idea Generation* session began. In this session, the brain-sketching process was conducted in three cycles, and by the end of each cycle, every student presented his or her conceptual idea to the group. A total of 21 concept ideas were generated in this session. Group 1 produced a total of 12 concept ideas for hanging wall decoration, wall clock, objects on the porch, and table lamp. As one of the participants from Group 2 was absent, the group produced 9 concept ideas for standing lamp, functional home-deco, and lighting on the wall. The design workshop ended with a short presentation by each team on their results for the Design Direction Framework and Idea Generation sessions and their feedback on the overall experience. Two design lecturers from the institute joined for the presentation. Figure 6.24 exhibits an overview of the activities during the design workshop conducted in the institute.

Exploring Heritage Products: The lion head

This session was conducted in the lion head workshop, located in a small industrial area 30 kilometers from the institute. As there is limited space available in the workshop, the session was organized at a shop corridor next door. Once the space for the session was decided the researcher prepared the tools needed. Each group was provided with a print copy of the MPV model, a PV canvas on an A2 paper, sticky notes, and markers. Next to this, a sample of a lion head was given by the troupe as a reference for the session. During this session, there are no specific troupe members assigned to the session; instead, they were working as usual and joined the session spontaneously. Also, one of the students from Group 1 did not participate due to personal reasons. Figure 6.22 presents the overview of the session.

The session started with an introduction about the MPV model, its different layers and their connections to the PV canvas. After a short Q&A session, the students began their activities of exploring the different values related to the lion head by observing and engaging with the troupe members who were working in the workshop. Although the session was conducted while these members were actively working, they seemed open

and enthusiastic to share their knowledge and experiences about the different aspects of lion dancing as well as the art of making lion heads. Sifu S and two of the troupe members also gave a short training to the students on the basic body movements in lion dancing. From these interactions, the students interpreted their experience and mapped statements onto the PV canvas. At times, they also shared what they mapped onto the canvas with the troupe members and among themselves. Figure 6.23 presents the selected heritage products and the outcomes of this session.



Figure 6.21: The overview of the design intervention sessions conducted in the institute.



Figure 6.22: The overview on the activities in 'Exploring the lion head'.



Figure 6.23: The lion head and the outcomes of the session.

By the end of the session, 140 statements were mapped on the two PV canvases; 77 statements from Group 1 and 63 statements from Group 2. Table 6.8 presents the number of statements mapped in each layer of the MPV model. The researcher took a passive role in this session; this means that her roles were limited to giving the introduction at the start of the session, observing the activities, and answering any questions related to the tools provided for the session.

Layers	No. of Statements		
	Lion Head		
	Group 1	Group 2	Total
Aesthetic	17	10	27
Interaction	8	14	22
Performance	11	12	23
Construction	22	14	36
Meaning	19	13	32
Total	77	63	140

Table 6.8: No. of statements mapped onto the PV canvases in Case Study 4.

Feedback and Insight

Similar to Case Study 3, this case study was also conducted with the participation of craft and design representatives. The positive feedback received from the design students suggested that the structure developed in this research can be useful in the education context. Similar to Case Study 1, the design students were excited with the Design Direction Framework as they see all their outputs were brought together. As for the craft representatives, their involvements were limited to the session Exploring Heritage Product. This decision was made due to the craft representatives' interest and motivation to share their knowledge as well as their time constraint; it would have been an interesting endeavor to include them in the overall design process. Nevertheless, this alternative setup is based on the existing situation of a craft team who are actively working and at the same time, keen on sharing their knowledge and experience. Through this arrangement, this research identified that craft representative do not necessarily need to be involved in the entire design process; however, what remains vital is their involvement in the process was made explicit, and their contributions were made tangible (as statements mapped onto the PV canvas).

From the session, the researcher also observed various ways in which the troupe members shared their knowledge, notably via (a) discussion and explanation, (b) using samples, materials, and tools in the workshop, and (c) training and demonstration. For example, they shared the different techniques used to assemble the mechanical system for the moveable parts of the lion head and how these parts are controlled in between the dance movements. When asked about their interactions with the product, a troupe member automatically demonstrated his routine to show how to maneuver the lion head according to certain dance steps. Even though no specific members were assigned for the session, some members spontaneously left their

workspaces and joined the students for the exploration. As for the design students, their primary role in the session is eliciting and mapping the statements shared by the troupe members. Conducting the session close to the workshop highlighted the richness of elements within a craft environment and offered various points of exploration and discussion for both craft and design representatives.

6.3.6 Primary Stage: Case Study 5

The Versatile Bamboo Mat

This case study was initiated by the researcher following the connection made with the owner of the company, Mr. T, during Lifestyle 2012. The company, DHN Co. Ltd. is a producer and an exporter for handicraft and home furnishing products. Their product lines include home, kitchen, and bath accessories, decorative items, baskets, wall panels, and small pieces of furniture which have been exported to more than 30 countries. Ten years ago, the company invested in the production of pressed bamboo sheets. This material is a good diversification as it supports DHN Co. Ltd.’s strategy for high-volume and low-cost productions, reduces their reliance on fully hand-woven items, and allows them to create products that exude local aesthetic values and are aligned with their target market—the low to the middle-end market segment. Considering the characteristics of this material are compatible to DHN’s business strategy, Mr. T was eager to develop new product collections using this material as its core element and agreed to participate in the research.

The Design Intervention Sessions

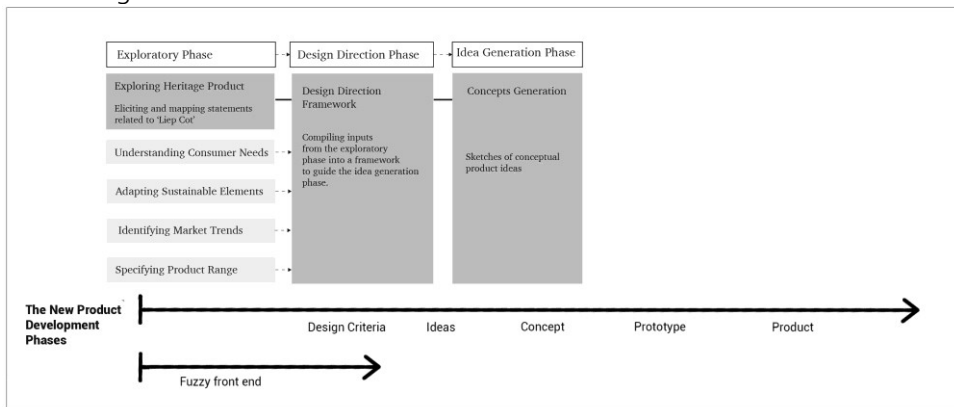


Figure 6.24: Structure of the design workshop for Case Study 5.

Figure 6.24 illustrates the design intervention sessions structured in this case study. The design workshop was conducted in DHN’s factory; however, due to a tight production schedule only Mr. T participated in the design workshop and the researcher took an active role to support the workshop. This three-day workshop began with the session *Exploring Heritage Product*. This session was conducted after the researcher’s visit to the collection/training center where the villagers produce bamboo mats used as

the outer layer of the pressed sheets. In the second day, four other sessions within the exploratory phase were conducted: 1) *Understanding Consumer Needs*, 2) *Adapting Sustainable Elements*, 3) *Identifying Market Trends*, and 4) *Specifying Product Range*. Since Mr. T was clear on the target market, each session explored the different possibilities based on this business direction. On the final day, both Mr. T and the researcher mapped the outcomes of the sessions from the Exploratory Phase as the *Design Direction Framework*. In essence, the collection focused on simple everyday objects or home accessories items with basic attributes with value for money for the consumers. These products should be easy to use (as well as understand), affordable, and of quality even though they are produced for the low-end market segment. These considerations relate closely to the company's aim to develop quality, mass-produced and cost-sensitive collections. The design direction also includes story-telling behind the collection; specifically on Vietnam bamboo heritage as well as the company's sustainable practices.

Using this framework as a guideline, the *Idea Generation* session was conducted based on three product ranges: kitchen, tabletop, and bath and storage. The brain-sketching process was conducted in two cycles for each product range. By the end of the cycles in each product range, Mr. T and the researcher discussed the ideas generated. In total, 12 conceptual ideas were generated with 4 concept ideas for each product range. Figure 6.25 presents an overview of the design workshop.

Exploring Heritage Products: The Enforced Bamboo Mat

The session began with the selection of the heritage product. In this case study, the selection of the heritage product was not as obvious as the previous two case studies. A general discussion with Mr. T about Vietnam's cultural heritage highlighted the importance of the bamboo mats which have been used as the outer layer of the pressed bamboo. Mr. T used the term *Liép cật* to express Vietnamese traditional bamboo construction as well as the pressed bamboo sheets. In Vietnamese, *Liép* can be translated as a sheet made from weaved bamboo (for example, as a screen or a mat) while *cật* can be translated as traditional structures that can be used to enforce or strengthen pieces of weaved bamboo. In the context of this research, *Liép cật* is defined as enforced bamboo mats and *Liép* as bamboo mats. According to Mr. T, *Liép* is a versatile yet common item found in a traditional household. It can be used as storage for rice, chicken fences, ceilings and walls (for traditional houses), or drying racks. Hence, it is common for households to store extra *Liép* at home. Although *Liép* has strong cultural connections with Vietnamese traditions and its applications are prevalent within the factory, most of the products made using this material are for the export markets. *Liép cật* was used on the chairs we sat on as well as the walls, doors, and partitions in the factory. Figure 6.26 shows examples of *Liép cật* found in the factory compound as well as in traditional households.



Figure 6.25: Overview of the design intervention session.



Figure 6.26: Examples of *Liép* and *Liép Cột*; in the factory (top pictures) and in Museum of Ethnology, Hanoi (bottom pictures).

Exploring Heritage Products: The Enforced Bamboo Mat

Once the heritage product had been identified, the researcher gave a short introduction about the different layers of the MPV model and how to map statements onto the PV canvas. Instead of using a poster-sized paper as the PV canvas, five sheets of A4 papers were used to represent the layers of the MPV model. Similar to the other case studies, marker and sticky notes were prepared as the tools to extract the information. Since Mr. T was the only representative in this case study, the researcher took an active role in the session. Based on the experience from the previous case studies, she focused on asking questions about the selected heritage product and discussing the different aspects between the pressed bamboo and the bamboo mat. Mr. T was knowledgeable about the pressed bamboo mat, especially on its construction and meaning to the local people. Each statement was discussed and mapped together with Mr. T. The session ended with a discussion and the selection of five interesting statements to be adopted in the design direction framework. The exploration lasted for 90 minutes and collected 55 statements. Table 6.9 presents the distribution of statements according to the layers.

Layers	No. of Statements
	<i>Liếp cột</i>
Aesthetic	9
Interaction	7
Performance	7
Construction	21
Meaning	11
Total	55

Table 6.9: No. of statements in Case Study 5.

Feedback and Insight

Similar to Case study 4, the different setup implemented in this case study was influenced by the limitations of conducting research involving active and voluntary stakeholders in the industry. However, these differences also provided an understanding of the reality in the field where time and resources for design efforts can be scarce. It also shows that the efforts and interest of craft stakeholders in design are growing. This highlights the importance of resources, support, and infrastructures to facilitate and assimilate design activities within the craft industry. This case study is the only case study where the researcher took an active role in the design workshop. However, as the participant was very clear on the company's design direction, her role was focused on supporting him in making the decision based on the content provided from the design workshop.

It is interesting to note that during the brain-sketching session, the participant adopted the brain-writing method instead; highlighting a different way of sharing and presenting ideas. In this sense, the discussion after the end of the brain-sketching cycles was beneficial in understanding the concepts and their connection to the content mapped onto the Design Direction Framework. Next to this, the selection of the heritage product in this case study was not as evident in comparison to Case Study 3 and 4. The process of selecting this particular product was an epiphany, as the bamboo mats are everywhere, yet due to its ubiquity as a material used in the production processes somehow its identity as a heritage product was concealed. Both the participant and the researcher were excited with this selection due to its relevance to the pressed bamboo and strong connection to the local cultural heritage.

6.3.7 Primary Stage: Summary

One of the main findings from the three case studies presented in this stage is the relevance of the session *Exploring Heritage Products*. Even though these cases were conducted with different participants and background settings the implementation of this session remained relevant in all three cases. This insight indicates the strong connection between the craft industry and the local cultural heritage. However, the process of selecting heritage products in Case Study 5 also hinted that the elements of local cultural heritage are slowly losing their place as the process of craft is evolving into standardized industrial practices (see 6.1.3). The implementation of Case Study 3

and 4 enabled the researcher to observe the exchange of knowledge between representatives from the craft and design domains of the selected heritage products. Both case studies presented the different methods used by the craft as well as design stakeholders to share their knowledge and ideas. Also, the positive feedback received from the design students from Case Study 4 suggests that the structure of the design workshop can be useful for educational purposes. The choice to use an adaptive design for case studies (see 3.1.1), as well as the modular aspect of the design workshop (see 5.2), had contributed to the implementation of these case studies. In reflection to these choices, a question remained: would the research benefit from a strict selection of participants and case study settings? Although, in theory, these choices might benefit the research, however, the strict considerations may impede the implementation of the case studies and the research may also miss the insight on the adaptability of the session Exploring Heritage Products in different background settings. In the Verification Stage, this research focuses on the implementation of this particular session in three different background settings: a) conducting the session in a craft workshop, b) conducting the session in different projects, and c) the application of the method developed in the session by a different facilitator.

6.3.8 Verification Stage: Case Study 6

The Clay Roof Tiles

This case study was initiated from the recommendation of Mrs. R, the director of a non-profit organization dedicated to safeguarding and disseminating knowledge and documents related to local craft practices, especially on the art of wood carving. During the meeting, she mentioned a craft workshop that produces a traditional clay roof called *Atap Singgora*. According to Mrs. R, the workshop was looking for a potential means to improve and sustain their business. This opportunity was the starting point of the collaboration with Mrs. N, the craft entrepreneur responsible for the production of the clay roof tiles. During the first meeting, Mrs. N discussed her situation and interest to find potential means to expand her business. Her workshop is well-known among local customers and visitors within the region as well as in the country. She has the ambition to expand the business further making it more attractive and economically viable to be passed on to the next generation.

The researcher invited three design researchers with experience in works related in the local craft to participate as design representatives. The first researcher, Mr. G completed his MSc with a thesis focusing on the design capability within the craft and manufacturing industry, the second researcher, Ms. K was in the process of completing her MSc thesis in on the semantics of visual in Kukuran (or the coconut graters), and the third researcher, Mr. S was conducting his MSc research on '*bemban*', a type of plant used for weaving in Borneo. They were invited to participate in the case study due to their design backgrounds as well as their interest and exposure on the local craft industry and its communities.

Figure 6.27 illustrates that only the session Exploring Heritage Products was conducted as part of a verification stage. One of the insights obtained in Case Study 4 highlighted the advantage of conducting the session in a craft environment. Therefore, this session was conducted with the participation of Mrs. N (as craft representatives) and the design researchers (as design representatives). Due to the time restriction, the other researchers were only available for this particular session. At a later date, the researcher made a personal visit to explore other design possibilities with Mrs. N; however, since the activities during this visit were not conducted according to the design intervention framework its content and outcomes were not included in this thesis.

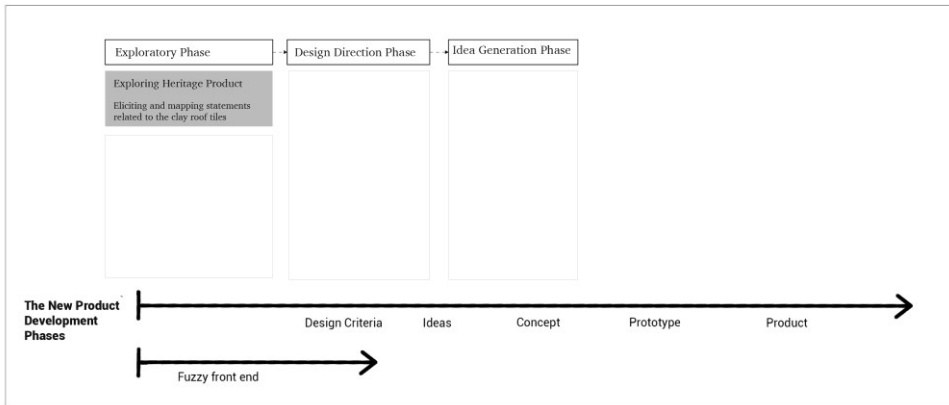


Figure 6.27: The design intervention session for Case Study 6.

Exploring Heritage Products: Atap Singgora

The design representatives and the researcher arrived at the craft workshop at the time agreed for the design intervention session; however, Mrs. N informed the team that she would be late as she and the other ladies from the workshop went to help the family of a villager who just passed away. The researcher took the time to prepare the tools required for the session; the MPV model, the PV canvas, markers, and sticky notes. Since there are no walls in the workshop, the PV canvas was placed on a low raised platform made of wood, locally known as *'pangkin'*⁹. In comparison to the other case studies, this session did not require a sample of the selected heritage product as it was conducted within the context of the product itself. Figure 6.28 presents the heritage product and the outcome of the session.

⁹ A piece of outdoor furniture for resting, chatting and doing household chores, similar to a divan.

The session started shortly after Mrs. N's arrival with an introduction about the objective of the session, the different layers of the MPV model, and how to map statements onto the PV canvas. Then the session of exploring *Atap Singgora* began. Since Mrs. N often shares her knowledge and experiences in producing this product and managing the family business, she started her story on the period when the production of *Atap Singgora* was a major economic activity in her village. As she shared her narrative, the design representatives took the role of extracting the content relevant to any of the layers and mapping them onto the canvas. Sometimes, the design representatives interrupted her narrative with other questions, and at times, for some clarifications. Due to her elaborate narrative, having four people (including the researcher) to capture and map the different statements was favorable to the session. Mrs. N also showed the different tools and materials in the workshop that are connected to the discussion, such as, a simple way to fix a cracked wooden mold using dry clay, a technique used to mold the tiles with her feet, and she also invited everyone to knead the pool of fresh clay in the middle of the workshop. From these interactions, the design representatives and the researcher made brief statements related to their experiences and mapped them onto the PV canvas. Figure 6.29 presents the overview of the activities of this session.

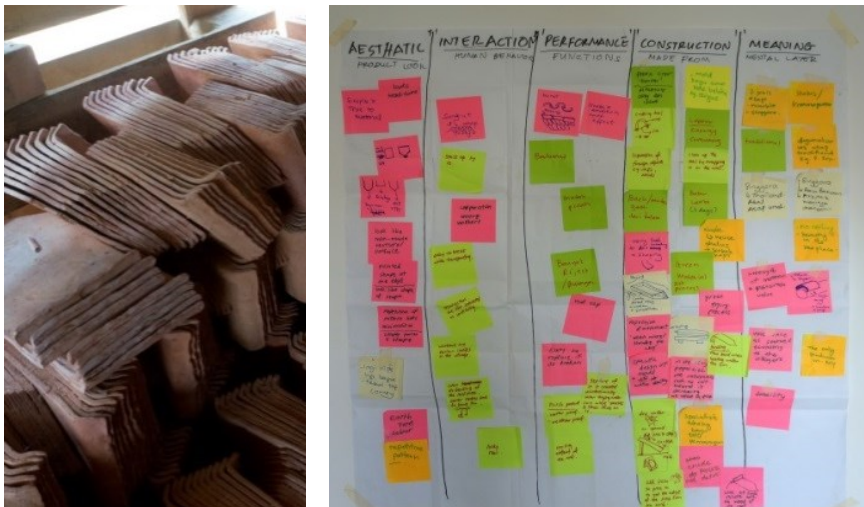


Figure 6.28: The *Atap Singgora* and the mapped PV Canvas.



Figure 6.29: Overview of the session.

By the end of the 90 minutes session, a total of 75 statements were mapped onto the PV canvas. Table 6.10 presents the number of statements mapped onto each layer. The researcher took an active role in this session in the process of exploring the heritage product. This decision was taken as the other design representatives were not available in the following design sessions; therefore, it is important for the researcher to immerse and develop a better understanding about the roof tiles.

Layers	No. of Statements
	<i>Atap Singgora</i>
Aesthetic	16
Interaction	8
Performance	13
Construction	24
Meaning	10
Total	75

Table 6.10: No. of Statements in Case Study 6.

Feedback and Insight

In this case study the research focused on the session *Exploring Heritage Product*. One of the elements explored in this stage was the implementation of this session in a craft environment. The researcher observed that although conducting the session within a craft setting can be an enriching experience for the design representatives; it is also a comfort zone for the craft representatives. This may influence the level of participation of craft representatives during the session. In this sense, having a neutral space where both representatives have similar autonomy may improve participations and collaboration of both craft and design representatives. Conducting the session in either neutral or craft environments has its own advantages and disadvantages. Therefore, it is important for the facilitator to take these factors into consideration when organizing the implementation of the session.

6.3.9 Verification Stage: Evaluation Cases

In addition to Case Study 6, the research also implemented four additional cases to evaluate the transferability of the method developed for session *Exploring Heritage Product*. In principle, the tools and setup developed for the session (see 5.2.1) were implemented in four different session settings outside the empirical domain. Two of the sessions were conducted by the researcher and the other two sessions were conducted by an external facilitator. Additional information about each evaluation case can be found in Appendix 7.

In the first evaluation case, the session *Exploring Heritage Products* was conducted in combination with a storytelling method in a creative workshop. The workshop was conducted with seventeen participants of REGIO-CRAFTS, a project focused on the development of the craft sector within the European Union. The participants were divided into four groups. Each group was required to develop a marketing narrative based on three to five values selected from a mapped PV canvas. In this context, the content mapped onto the PV canvas was used as a creative resource to develop stories that can be used as a marketing content by craft stakeholders. A craft person from Latvia mentioned that the exercise conducted in the workshop helped her in dividing her personal stories, experiences, and expertise into shorter, specific stories that are suitable to be incorporated in her website. Apart from the different workshop context, in this session different heritage products were explored simultaneously, and the sessions were conducted with a mix of participants from different countries. Although there is room for improvement especially in the selection of heritage products, this session showed that values mapped onto the PV canvas can be used as a creative resource in marketing. Furthermore, the session highlighted that the tools and setup developed for the session *Exploring Heritage Products* are transferable to a different context.

In the second evaluation case, the session Exploring Heritage Product was conducted in a design workshop in collaboration with House of Design (HoD), a design platform that organizes local as well as international initiatives in new technologies, sustainability, and the development of the cultural heritage of the 21st century. The workshop aimed to incite a sense of awareness about the local cultural heritage and observe how heritage can be used as a creative resource. Four designers and four craftspeople from the North of the Netherlands participated in the session. In comparison to the preliminary and primary stage, both the design and craft representatives had experience in design and creative activities. Therefore, the tools developed in the research were given to support their collaboration instead of being used as the main setup to guide their activities. One of the designers mentioned that canvas helped him to communicate with his team. Initially, they did not use the tools given, and their discussion revolved mainly on craft techniques and the process of making. The different layers of the canvas enable the team to explore elements beyond craft making, for example, the performance of an object in connection with its material. In this sense, the tools provided bring the craft person outside her comfort zone yet still keep her within her field of expertise and guided the process of sharing and exchanging knowledge between them. Two designers expressed interest in the tools and one specifically asked for more information about the MPV model and the PV canvas.

House of Design continued to use this method as part of their initiatives, specifically in two Erasmus+ projects in which craft knowledge is adapted in 3D printing education in school subjects. The third and the fourth evaluation case were based on their report and experience shared with the researcher.

In the third evaluation case, the session was conducted in L'Elia, Spain as part of a follow-up of the 3D Comenius project; a project aimed to embed 3D-thinking and 3D-printing in school subjects. In brief, the participants were asked to choose a heritage product, explore and map the values according to the layers, include 3D-printers as a tool in the construction layer, and use the new story as a starting point to develop new products. It was surprising for the teachers as well as the facilitators to see young students changing their attitude from being disinterested in heritage objects to developing a sense of their background and their heritage. The teachers were inspired by the workshop. From this experience, a teacher from Sneek, the Netherlands with the support from HoD adopted this method in a lesson plan for Itefskip—a social design lab with the aim to create souvenirs for the European Capital of Culture, Leeuwarden.

The application of the method in this 3D education project is the fourth evaluation case. The session was attended by the teacher and five students (age 14 to 15) involving the exploration of traditional wooden boat building in the Province of Fryslan. Based on their visits to the boat maker and historical boat museum in Sneek,

the students extracted the values and used it as a brief for designing souvenirs. The teacher was surprised by the creativity of the 'beta' students and highlighted that the method is helpful in developing creative skills for students with technical backgrounds. Within their initiatives, HoD interpreted the method as a means to empower youth to use local knowledge and local resources for new innovations. They highlighted that the tools narrow down the design process to a specific context—local cultural heritage and objects—and based on their experience, this approach is especially useful among participants with no design background.

“Your tool helps the student/pupil to have a handle to work on associating. To associate brings you to new forms.”

“Usually the general ‘creative’ work intuitively, what comes up. The process of association is not narrowed to context. This way is more from out of context to an object.” – House of Design (2017)

6.3.10 Verification Stage: Summary

In this stage, only the session Exploring Heritage Products were conducted based on the results from the Primary Stage. The method developed for this session had been successfully replicated in Vietnam and Malaysia. The research conducted the sixth session within the empirical domain to explore the potential of conducting the session within a craft environment. The results suggest that conducting the session in a craft environment can be enriching for the design representatives, but it may influence craft representatives' level of participation in the session. The research recommends a neutral environment for both representatives to promote inclusive participation during the session. Next to this, the research has shown that the tools and procedures developed in the sessions can be useful in different contexts and adopted by external stakeholders. The results obtained from the evaluation cases present two additional areas of applications for the method used in this session: a) exploring content for storytelling as part of a marketing strategy, b) part of high school educational lesson plan in creative projects.

6.4 Conclusion

This chapter has been divided into three sections. Section 6.1 introduced the general understanding of the local craft industry of Vietnam and Malaysia, specifically on the current practices of the product development process and the influence of the cultural heritage in craft products. Section 6.2 presents an overview of case studies implementation followed by section 6.3 which includes the descriptions of the case studies based on three different stages: Preliminary, Primary, and Verification.

Figure 6.30 illustrates the conceptual research model based on the findings from the empirical exploration.

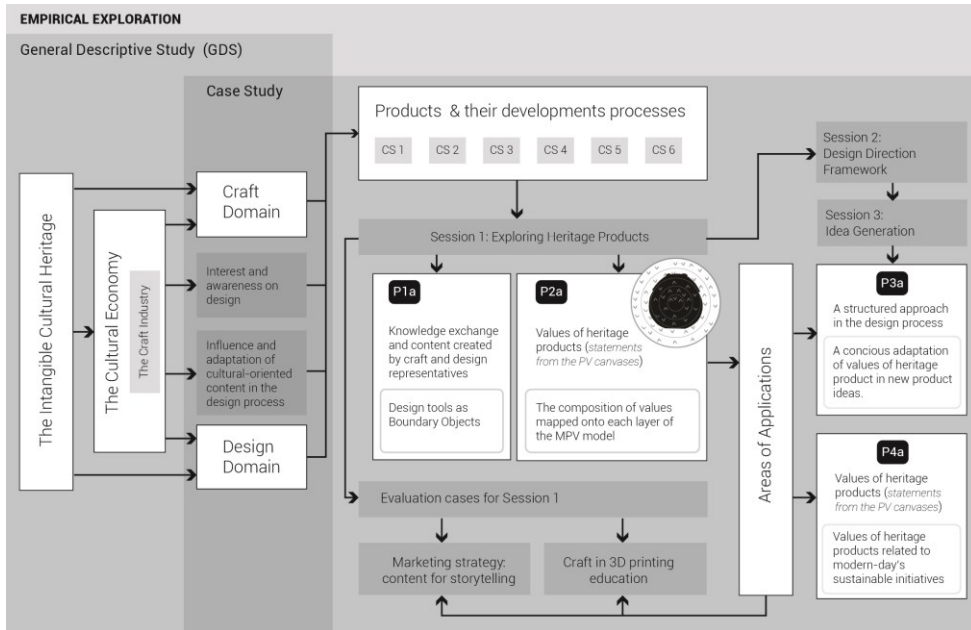


Figure 6.30: Conceptual Research Model based on results from the empirical exploration.

Findings from the General Descriptive suggest that representatives from the craft and design domains are invested in products and their development process. The growing awareness about the importance of the design process among local craft producers influenced their willingness to participate in this research. As for the design domain, culture-oriented content has been one of the creative resources adapted in the design process; however, craft representatives are not included in this process and the influence this content is not necessarily apparent in the end products. The implementation of the General Descriptive Study also enabled the researcher to develop a network among local craft stakeholders which supported the initiation and implementation of the design workshops.

Using the method developed in Chapter 5, specifically, Session 1, 2, and 3. The research included the participation of local craft stakeholders in the design process, adopted the use of heritage products in the design process and established a traceable linkage between new product ideas and heritage products. From the figure, it can be seen that that *Session 1: Exploring Heritage Products* is connected to all the propositions. The other two sessions—*Session 2: Design Direction Framework*, and *Session 3: Design Direction Framework*—are connected only to **P3a**. Empirical results presented in this chapter show that the tools and the procedure developed in *Session 1* have been evaluated (establishing transferability of the method) via four evaluation

cases. The results indicated that the method is applicable in different settings and can be adopted by external facilitators. Furthermore, through these cases, the research recognized two new areas of application for values of heritage products: a) content for storytelling in building a marketing strategy and b) adapting the knowledge of craft in school education.

In relation to **P1a** (Table 6.11), the empirical results show the different roles and level of involvement between craft and design stakeholders in the development of traditional and contemporary craft products underlining their interest in products and their development processes. Next to this, the implementation of the design intervention sessions, especially *Session 1*, demonstrated the interest and favorable circumstance for both domains to share and exchange their knowledge about heritage products. In the next chapter, the research continues to examine in detail the exchange of knowledge between craft and design domains and the content created in *Session 1*. Specifically, the research analyzes how the design tools employed in the session served as different types of boundary objects capable of representing knowledge from each domain, stimulating knowledge exchange across domains, and transforming part of the tacit knowledge shared into explicit forms.

As for **P2a**, the research proceeds to analyze the composition of values mapped onto each layer of the MPV model. A total of seven different heritage products were explored through the implementation of *Session 1*. The values inherent within these products were elicited according to the five layers of the MPV model: aesthetic, interaction, performance, construction, and meaning. This research considered that values of heritage products are comparable to statements mapped onto the PV canvases. Therefore, to understand and describe the composition of values attributed to each layer, the statements mapped onto the PV canvases were analyzed and coded using the content analysis method in the next chapter. Table 6.11 presents the overview of the propositions, the empirical findings, and the segments to be analyzed in the following chapter (highlighted in gray).

Part 1: Identifying Values of Heritage Products

Proposition 1a

The craft domain and the design domain interests in products and their development processes offer an opportunity for both domains to exchange their knowledge about heritage products; the theory of boundary objects can be used to examine the exchange and articulate tacit knowledge associated with heritage products into a codified form.

Proposition 2a

The composition of values attributed to a heritage product can be understood, described, and nearly decomposed according to a set of interrelated elements that comprises of aesthetic layer, interaction layer, performance layer, construction layer, and meaning layer.

Table 6.11: The empirical findings and segments for further analysis in relation to Proposition 1a and 2a.

Concerning **P3a**, the findings from the General Descriptive Study highlighted that culture-oriented content (specifically, values of local cultural heritage) has been adopted in contemporary craft products; however, these adaptations are not necessarily inclusive (see 6.1.2) or conscious (see 6.1.4). Through the implementation of the case studies, this research tested a structured approach that includes the participation of local craft stakeholders and the use of heritage product in the fuzzy front end of the product development process (see Figure 5.2). In the following chapter, the research examines how this structure advocates inclusive participation of local craft stakeholders. The analysis focuses on discerning the link between heritage products and new products ideas using content from the PV canvas and Design Direction Framework as the connectors. This analysis aims to ascertain how values of heritage product can be consciously adapted in new product ideas using this approach.

In Case Study 2 (Preliminary Stage), 13 out of 52 statements mapped onto the PV canvas were identified to be connected to sustainability. This identification was made by two designers working on the SPIN project. However, this result could not be replicated as there were no other participants in the subsequent case studies with knowledge or experience in sustainable product design. In relation to **P4a**, this finding indicates that elements of sustainability are inherent to heritage products. To investigate this finding further, this research analyzed the statements mapped onto the PV canvases against the Framework of Sustainable Elements (see Figures 4.15 in 4.6.2) to systematically elicit values attributed to heritage products that can be useful in modern-day's sustainable initiatives. Table 6.12 presents the third and fourth propositions and highlights segments of the propositions to be analyzed in the next chapter. *Chapter 7: Analysis and Discovery* begins with an overview of the primary data, mainly the session's artifacts used in the analyses.

Part 2: Applying Values of Heritage Products as a Creative Resource

Proposition 3a

Values of heritage products can be used as a creative resource via a structured approach that includes the participation of local craft stakeholders and the deliberate inclusion of heritage products as an input in the fuzzy front end of the product development process. The approach promotes an inclusive and conscious adaptation of culture-oriented content in new design ideas.

Proposition 4a

Heritage products comprise of interactions from the past which can be useful in modern day sustainable initiatives, this research proposes that the framework of sustainable elements associated with products can be used as indicators to identify and elicit these interactions.

Table 6.12: Proposition 3 and 4 with highlighted segments for further analysis.

Chapter 7

Analysis and Discovery

This chapter presents four analyses of data collected during the empirical exploration and the discovery made in line with the research propositions.

7 Analysis and Discovery

In Chapter 6, the research implemented and evaluated the tools and procedure developed for the design intervention sessions, namely *Session 1*, *Session 2*, and *Session 3*. In this chapter, the content created during these sessions will be analyzed in line with the segments of propositions identified in the previous chapter. Based on the propositions, the research conducted four analyses of data collected across six case studies described in section 6.3. Data from the evaluation cases are not included as the cases were conducted outside the empirical domain. Table 7.1 shows the list of the case studies in connection to the analysis. As mentioned in section 5.3, the primary data analyzed in this research is a) the case study descriptions and b) sessions' artifacts which refer to the physical content created by the participants during the sessions (see also 3.3.1).

Case Study	Analysis 1	Analysis 2	Analysis 3	Analysis 4
CS 1: Bamboo Strands from Vinh City		■	■	
CS 2: The Vietnamese Tea Warmer		■		■
CS 3: The Sayong Water Pitcher	■	■	■	■
CS 4: The Lion Head	■	■		
CS 5: The Versatile Bamboo Mat		■	■	■
CS 6: The Clay Roof Tiles		■		■

Table 7.1: The case studies in relation to the analyses.

As Table 7.1 shows, Analysis 1 is conducted based on the data collected from Case Study 3 and 4. This analysis is performed in line with **P1a** which focuses on examining the exchange of knowledge between craft and design domains and transforming tacit knowledge associated with heritage products into explicit forms using the theory of boundary objects. Both cases were conducted in Malaysia and have been selected due to a clear division between craft and design representatives involved in the design workshop. This division was not apparent in the case studies conducted in Vietnam (Case Study 1, 2, and 5) as the craft representatives were from the local SMEs: the stakeholders involved in the product development process but were not directly responsible in making the craft products (see 6.2.1). Case Study 6 was not included as all three design intervention sessions were not implemented in this case.

Analysis 2 is conducted to probe the composition of values inherent within heritage products. **P2a** underlines that values attributed to heritage products can be understood, described, and nearly decomposed based on a set of interrelated elements. This research uses the five layers of the MPV model and the PV canvas as a set of tools to explore, identify, and map the values attributed to a selected heritage product. As shown in Table 7.1, this analysis is conducted based on the data collected in all six

studies. A total of seven heritage products are explored in this research (Figure 7.1): four heritage products from Vietnam and three from Malaysia.

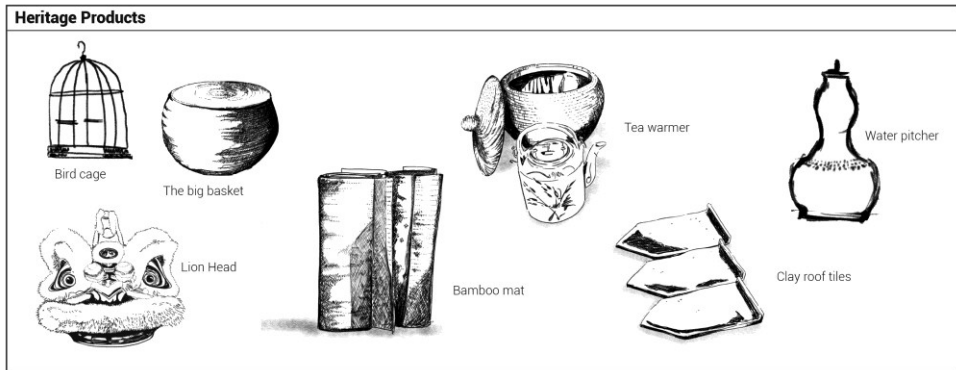


Figure 7.1: Seven heritage products explored during the empirical exploration.

Analysis 3 is performed to examine the combination of three design intervention sessions as a structured approach that promotes an inclusive and conscious adaptation of values of heritage products (as culture-oriented content) in the product development process. This analysis is in line with **P3a**, and it focuses on discerning the link between heritage products and the concepts generated during the idea generation sessions. As seen in Table 7.1, this analysis is conducted based on data from three case studies: Case Studies 1 and 5 from Vietnam; and Case Study 3 from Malaysia. These cases were selected because each case: 1) involved the participation of craft representatives who are active within the local industry and therefore in developing a new product collection, and 2) attended all the three design intervention sessions. Due to the first factor, Case Study 2 and 4 were not included in the analysis while Case Study 6 was not included due to the second factor.

Finally, Analysis 4 is conducted to elicit sustainable elements inherent within heritage products. This analysis is in line with **P4a** in which the research proposes that the Framework of Sustainable Elements (FoSE) can be used as a guide to screen and elicit values of heritage products that can contribute to modern-day sustainability initiatives. In this analysis, four selected case studies were clustered according to the type of material used: a) forest-based products from Vietnam (Case Studies 2 and 5) and b) earth-based products from Malaysia (Case Studies 3 and 6). Case Study 1 was not included in this analysis as two heritage products had been explored in the session and Case Study 4 was not selected since the selected heritage product is made of mixed material. Figure 7.2 is an extension of Figure 5.9 presenting the connection between the design intervention sessions, the empirical data, and the analyses. The figure also illustrates the different heritage products included in each analysis.

Each analysis begins with an introduction that briefly recaps the theoretical discussion from Chapter 4 and the empirical findings from Chapter 6. Next, the research discusses

the method and describes the data used in the analysis. The results are presented followed by a discussion based on the empirical data and the theoretical understanding. Lastly, the research concludes each analysis in reference to the propositions.

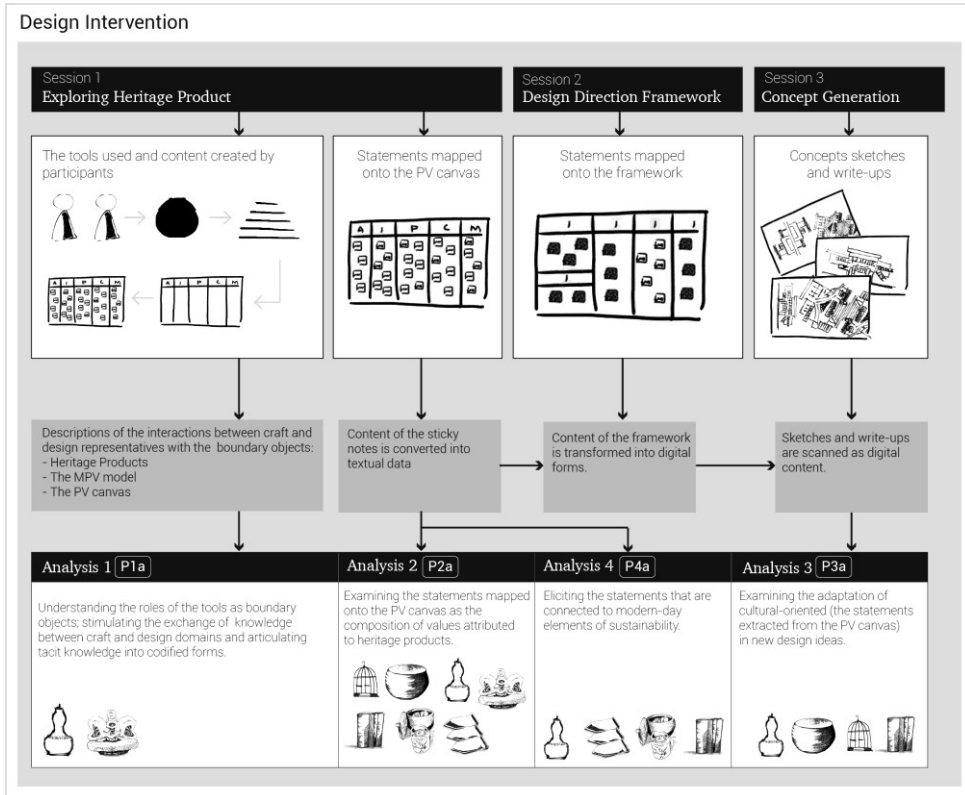


Figure 7.2: The connections between the design interventions, the empirical data, and the analysis.

7.1 Analysis 1: Enhancing Knowledge Exchange and Transformation Using the Concept of Boundary Objects.

There are two main aspects explored in this analysis: a) the exchange of knowledge between craft and design representatives, and b) the transformation of tacit knowledge into explicit forms. In subsection 4.2.5, the research underlines the opportunity for both craft and design domains to collaborate and share their knowledge in a meaningful way. This area of opportunity was investigated during the empirical exploration where the research developed and conducted a design intervention setup that offers a platform for craft and design representatives to share and exchange their knowledge about heritage products; products that are inherited from the previous generations, closely connected to the craftspeople, and a point of inspiration for designers (see 1.1.2). The theoretical discussion also highlights that knowledge associated with heritage products is commonly transferred in tacit forms due to craftspeople's reliance on knowledge-in-practice (see 4.2.3), and findings from the General Descriptive Study (see 6.1.2) corroborate these insights. Hence, there are certain needs as well as a fascinating opportunity for this research to make some aspects of tacit knowledge related to folkcraft explicit.

In this analysis, the research examines the exchange and articulation of tacit knowledge associated with heritage products shared between craft and design domains during *Session 1: Exploring Heritage Products* (see 5.2.1). The analysis explores how a combination of design tools—described as boundary objects—supports the process of knowledge exchange between the craft and design domains and transforms tacit knowledge into explicit forms. Theoretical findings underline that boundary objects can bring craft and design domains together, stimulate the exchange of knowledge across domains, and offer a structure to examine how knowledge can be represented, translated, and transformed into codified forms (see 4.2.4 and 4.2.5). This research adopts this concept as a means to codify and structure the knowledge shared between craft and design representatives during a design intervention session.

7.1.1 The Method of Analysis and Empirical Data

As discussed in section 3.1, this research adopted the design intervention approach to empirically explore the concept of boundary objects in practice. Design intervention is a method in which certain constraints are prescribed to induce change in a current situation of phenomenon (Blessing & Chakrabarti, 2009, p. 10). In the context of this research, the 'implementation of an intervention' is developed based on creative facilitation methods where design workshops were conducted in order to generate ideas and create solutions. Using that approach, the research devised a setup to operationalize the activities in a design intervention session. This setup consists of tools and a procedure to guide the implementation of the session (see 5.2.1). Using this structure, the research investigates the roles of design tools as boundary objects,

specifically looking at their capacity to represent, share, and transform knowledge in the context of craft-design collaborations.

This analysis is conducted based on theory proposition, one of the analysis methods for a case study approach proposed by Yin (2014, p. 136). This method offers the means to explain a phenomenon, support the process of organizing data, and highlight the relevant context and content to be examined (Yin, 2014, p. 149). Through this approach, different types of empirical data that are considered relevant to the theoretical propositions are included in the analysis. Expanding from this strategy is the process of explanation building in which the empirical data is examined, theoretical propositions are revised, and the data is re-examined from a new perspective (Yin, 2014, p. 147). The iterative nature of this process is suitable in a multiple-case study approach. Even though explanation building is commonly generated in a narrative form, explanations anchored with theoretical propositions produce better outcomes (Yin, 2014, p. 147).

In this analysis, the research uses the theory of boundary objects as a theory proposition to examine the empirical data. In this analysis, the empirical data refers to the case descriptions and session artifacts relating to the tools prescribed during the design intervention session. The tools are considered as a set of media to facilitate the exchange of knowledge and support the process of knowledge transformation. Accordingly, these tools are examined based on the different traits of boundary objects below (see 4.2.4):

- Represent the knowledge of both craft and design domains
- Provide a shared syntax or common method of communication between the domains
- Create the means for craft and design stakeholders to adapt domain specific content at a systemic level, and
- Generate a database based on shared resources.

As mentioned in the Introduction, this analysis uses data from Case Studies 3 and 4. Case Study 3 included the participation of a local craft entrepreneur and an industrial designer from a local craft organization (see 6.3.3) while Case Study 4 included the participation of a lion dance troupe and eight design students from a local design institute (see 6.3.5).

7.1.2 The Design Intervention Sessions

Figure 7.3 shows the different environments where the design intervention sessions were conducted. The session for Case Study 3 (*water pitcher*) was conducted in the organization's office whereas the session for Case Study 4 (*lion head*) was conducted near the craft workshop. Both settings resemble a typical creative facilitation session; however, the setting of the Case Study 4 session was less formal as it was conducted

within the craft environment. In Case Study 4, the students were free to discover the workshop while the troupe members were still working, and the members engaged with the students and shared their knowledge about the heritage product. This situation reflects Ravetz, Kettle, and Felcey (2013, p. 3) notion about the craft domain as “highly social and open to shared working.” Both sessions commenced based on the procedure introduced in subsection 5.2.1. A total of three mapped PV canvases were collected in these case studies.



Figure 7.3: The two environment settings for the design intervention sessions: a) Case Study 3 (left) and b) Case Study 4 (right).

The Selected Heritage Products

The selection of the heritage products came naturally as the selected heritage products are part of both craft representatives cultural inheritance and local identities. The existence of these products can be traced back through previous generations of family members as well as their respective communities. These products are intimately connected to their daily activities. The first product was a *Labu Sayong* (Figure 7.4), a traditional water pitcher native to the Sayong area, which is made of locally excavated clay with a black luster finish, and decorated using a stamp-impressed relief technique

with nature motifs. This symmetrical bottle gourd exerts major influence in the development of the local craft industry and inspires the production of various types of craft products, including souvenirs, corporate gifts, and home-decor items. The second heritage product was the lion head (Figure 7.4), a costume used in lion dance performances to mimic a lion's various emotions and expressions. The lion head is designed with a basic mechanical system that allows the movement of its ears, eyes, and mouth. Rattan, square-aluminum tubes, and masking tape are used to make the skeleton, which is then covered with paper and glue, and decorated with various colorful designs using paints, sticker papers, and fur.



Figure 7.4: Selected heritage products: a) Labu Sayong (left) and b) Lion Head (right).

The Exchange of Knowledge during the Sessions

In both sessions, the research observed the representatives' actions and discussion, mainly on how knowledge is shared, elicited, and mapped onto the canvas. For example, in Case Study 3, the design representative shared his impression about the water pitcher based on a design principle *'form follows function'* in which he explained that the small upper chamber of the gourd reduces the chance of overflowing while pouring water (refer to Statement A and B in Figure 7.5). The craft representative shared that in the old days, water pitchers were made from pumpkin gourd (refer to Statement C in Figure 7.5). This explains the name *'Labu'* meaning 'pumpkin' in the Malay language. According to Whitaker and Cutler (1965) water pitchers made from gourds were common household items in the pre-pottery era. Next to this, insights related to traditional design principles were also elicited. The repetitive pattern stamped on the surface of the water pitcher not only has aesthetic value, but it also has a functional purpose as well as a social meaning embedded (refer to Statement D, E, and F in Figure 7.5). The impressed patterns improve the grip as they increase friction during use, and a principle in a form of allegory was used to guide the design of the surface patterns. *"Tajam tidak menikam"*, which means "what is sharp should not be piercing", dictates that any shapes or lines with sharp edges should not be touching another shape or line. This principle holds a deeper meaning within the Malay community as it serves as a reminder: "do not stab someone (or your friend) in the back". Such discussions with different sources of information and experiences create a

meaningful knowledge exchange among the representatives and nurture a healthy discourse between the craft and design domains about design in general.

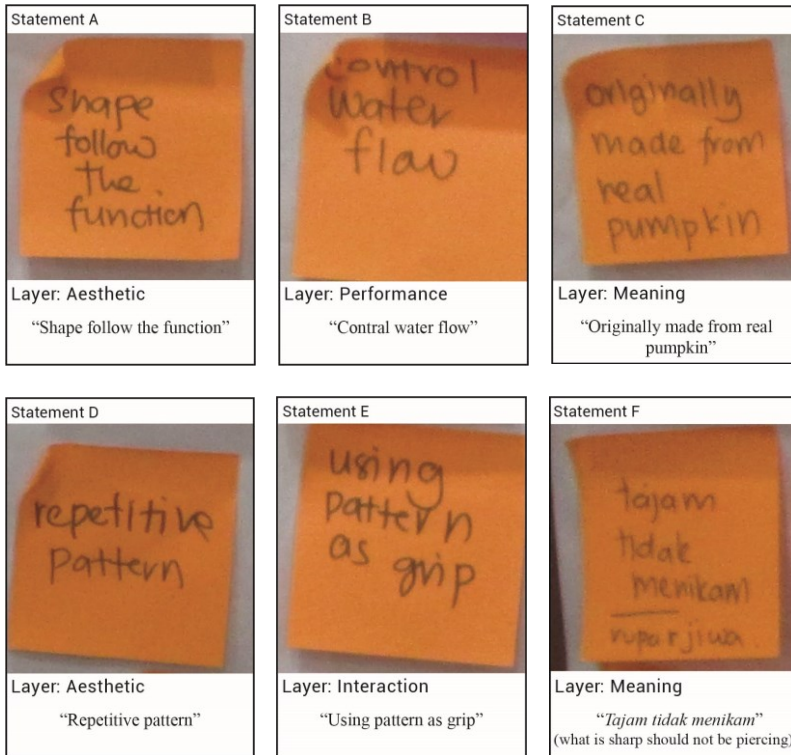


Figure 7.5: Samples of the statements mapped onto PV canvas from Case Study 3.

Case Study 4 provided insights on the way craft representatives shared their knowledge. For example, when asked about their interactions with the heritage product, instead of verbally answering the question, one of the troupe members demonstrated how the lion head is used during one of his routines. They also gave a short training on the traditional way of moving with the lion head to the design representatives. Then, the design students interpreted their experience and mapped it onto the PV canvas. Figure 7.6 illustrates the situation and three of the statements mapped in the Interactions layer reflecting the fundamental skills required of a lion dancer in order to perform. This situation presents an example of *socialization* where knowledge is transferred in its tacit form; and *externalization* where design representatives articulated part of the tacit knowledge shared into explicit forms. It also demonstrates that the explicit forms (i.e. the statements) represent only the tip of the knowledge shared, highlighting the inextricable connection between tacit and explicit knowledge (see 4.2.3).



Statement A

Layer: Interaction
 "Hold (over shoulder)"

Statement B

Layer: Interaction
 "Requires good strength and stability"

Statement C

Layer: Interaction
 "Possible muscle injury"

Figure 7.6: The session environment and the samples of statements from Case Study 4.

The craft and design representatives in both case studies demonstrate similar ways of sharing their knowledge. In both sessions, craft representatives often shared their knowledge in a casual manner and their narratives resemble informal and personal storytelling. They are experts on heritage products; however, their knowledge is a mixture of experiences, for instance their personal history, the local cultural heritage, and their traditional as well as contemporary skills and techniques. On the other side, design representatives understand the various aspects related to products in general. Furthermore, due to their design training, they are experienced in probing, eliciting and clustering information in a design intervention session. This highlights the different roles played by the representatives. The combination of these areas of expertise enables them to explore and map knowledge associated with the selected heritage product during the design intervention session whilst enriching knowledge in their respective domains.

In both case studies, the representatives involved elicited and mapped content not necessarily according to the sequence of the layers but rather as they occurred naturally during the discussion, indicating that each layer can be accessed interchangeably during the session.

7.1.3 Boundary Objects: Roles in Enhancing Knowledge Transmission

This analysis is conducted to examine how the exchange of knowledge between craft and design domains can be proficiently articulated by using the concept of boundary objects. Specifically, the research explored how a combination of different types of boundary objects act as scaffolding that facilitates the exchange of knowledge across two domains. During the design intervention sessions the research observed both methods of sustaining tacit knowledge as proposed by Nonaka (1994): *socialization*, as tacit knowledge is shared among representatives throughout the design intervention session; and *externalization*, in which the prescribed boundary objects support participants to seek, identify, and transform part of the tacit knowledge shared during the session into explicit forms. These empirical results therefore indicate that the prescribed boundary objects stimulate knowledge transmission across domains. The combination of these boundary objects forms a systematic approach to enhance knowledge exchange and collaboration between craft and design domains. Results from the design intervention sessions suggest that the use of different types of boundary objects as a medium of translation allows tacit knowledge to be represented, learned, and transformed. In Table 7.2, the empirical results underline four different boundary objects based on the categories and characteristics identified in subsection 4.2.4.

Categories	Boundary Objects	Characteristics	Design Intervention Session			
			Case 3		Case 4	
			Design	Craft	Design	Craft
Platonic object	Heritage product	Represents knowledge from different domains	✓	✓	✓	✓
Standardized form	MPV model	Provides a shared syntax between domains to be learned	✓	✓	✓	○
Maps of boundary	PV canvas	Provides a means to adapt domain specific knowledge in a systematic way	✓	✓	✓	○
Repository	Mapped PV canvas	Generates a database based on shared resources	✓	✓	✓	✓

Table 7.2: Boundary objects, their characteristics, and usage by craft and design representatives in the design intervention sessions.

Boundary Objects: Their Roles and Characteristics

A heritage product is an object capable of representing knowledge from different domains. From the perspective of the craft domain, it represents knowledge of product making that is commonly inherited, informally learned, and tacit in nature. From the perspective of the design domain, a heritage product although exotic is still a product. Therefore, design theories related to modern products and its production processes are equally applicable in understanding heritage products. The intersection of informal knowledge acquired by craftspeople and formal knowledge learned by designers can be an interesting point for knowledge exchange. These characteristics place heritage products in the first category of boundary objects—*platonian objects*, an independent object capable of representing knowledge from both craft and design domains, sparking interest, and bringing these two different domains together.

Table 7.2 shows that all representatives in Case Study 3 directly used the MPV model and the PV canvas; however, it was different in Case Study 4 as the craft representatives did not use the MPV model and the PV canvas directly. The MPV model constituted a shared format for supporting the session by using layers as points to trigger discussion between the craft and design domains. Design representatives seemed comfortable with adopting the layers as their means to communicate, probably because the model was adopted from design theories. The craft representatives,

particularly in Case Study 4, relied more on their design counterparts to ask questions based on the layers. Furthermore, their answers are not necessarily limited to content related to the specific layers as the craft representatives' knowledge about heritage products represents complex, abstract relationships cultivated by a network of informal knowledge system. In this situation, design representatives' involvement in clustering the information was useful in the session. As this sharing and clustering happened *in-situ*, it filters and deconstructs craftspeople's tacit knowledge, which often emerges in the form of personal stories and narratives.

In brief, the craft representatives shared their knowledge and expertise about the heritage products; while the design representatives elicited, synthesized, and clustered this knowledge according to the MPV model. By the end of the session, knowledge about the selected heritage products is transformed into explicit forms that fit in the context of both craft and design domains, enriching and altering their knowledge from before the session. For craft representatives, the process disrupts their conventional narratives about the selected heritage product and reconstructs them into a new, simpler structure. For design representatives, the process presents means to learn about the different aspects of heritage products based on contemporary design theories. These findings suggest that the MPV model has the characteristic of *standardized forms* (Carlile, 2002; Star, 1989), indicating its potential to reduce domain-specific content by providing simple, yet relatable knowledge to be shared and can thus be used as a shared syntax between the craft and design domains.

Next to this, the PV canvas represents a shared space allowing representatives to map part of the knowledge shared during the sessions. It accommodates and adapts domain-specific content by splitting it into brief statements and reconstructing them based on the layers of the MPV model. By extension, the layers within the canvas were accessed without any hierarchical order, which suggests a discursive nature of the canvas. The process is exploratory and the content generated depends on the participants, selected heritage products, and the collaborative settings. The insights captured demonstrate that the PV canvas resembles a *map of boundary* (Carlile, 2002; Star, 1989) where specific areas of knowledge from craft and design domains can be assimilated in a systematic manner.

The mapped PV canvas constitutes an early form of a database because it comprises codified content structured using the layers of the MPV model as its format. It can serve as a starting point of a database about heritage products that is constructed from local sources and compiled based on a specific standard. Each statement mapped onto the PV canvas can be accessed individually, if required or desired. This means that the content is modular and can be independently accessed, used and borrowed by representatives from different domains for various purposes (Star & Griesemer, 1989). The mapped PV canvas corresponds to the characteristics of a *repository*: a database

based on a specific structure, composed from collective resources, and systematically organized (Carlile, 2002; Star, 1989).

7.1.4 Conclusion

In this analysis, the research has shown that craftspeople and designers can work together more effectively with the support of different types of boundary objects. These objects act as scaffolding that supports knowledge exchange and collaboration, particularly on specific knowledge within each domain that might be of value to the other. Using these objects, part of the tacit knowledge shared is made explicit and structured.

Based on the four types of boundary objects prescribed in the empirical exploration, heritage products were input factors that differed between sessions whereas the MPV model and the PV canvas used to elicit and map intangible values were the same. This suggests that the MPV model and the PV canvas represent universal objects essential to replicating the session. The mapped PV canvases represent a compilation of information acquired through collective efforts of craft and design representatives and knowledge from each domain that has been transformed to fit the context of the other. For craft representatives, their knowledge about heritage products is no longer just their personal narratives; it has been disrupted and reinforced based on contemporary design theories. This thematic structure is useful for craftspeople to share their knowledge among each other as well as with outsiders in a simple and systematic manner. Design representatives have the opportunity to gain in-depth knowledge about a heritage product and its connection to the local craftspeople and their cultural heritage. Such understanding can nurture awareness among designers in adapting values associated with local cultural heritage in their product ideas—consciously and responsibly.

In brief, the result of this analysis shows that through the use of different types of boundary objects tacit knowledge associated with heritage products can be represented, learned, and transformed. This finding leads to the first proposition for this research:

Proposition 1a

The craft domain and the design domain interests in products and their development processes offer an opportunity for both domains to exchange their knowledge about heritage products; the theory of boundary objects can be used to examine the exchange and articulate tacit knowledge associated with heritage products into a codified form.

Final Proposition 1

The craft and the design domains' interest in products and their development processes offers an opportunity for both domains to exchange their knowledge about heritage products; through the use of different types of boundary objects, tacit knowledge associated with heritage products can be represented, learned, and transformed.

The empirical method devised and employed in this research enabled a detailed study of a specific combination of design tools as boundary objects in design interventions. This highlights the potential to evaluate and compare other existing design tools as boundary objects to enhance knowledge exchange and collaboration across domains. However, the findings in this analysis can only serve as a preliminary study in this topic as data from two design intervention sessions can be vulnerable and specific to this study. Therefore, conducting more sessions with similar conditions will offer more compelling and robust results with substantial analytical and evaluation benefits. In the following analysis, the research examines the content created during *Session 1: Exploring Heritage Products*.

7.2 Analysis 2: The Composition of Values of Heritage Products

The main objective of this analysis is to examine how the layers of the MPV model can be used to understand, describe and decompose values attributed to heritage products. In subsection 4.3.5, the research identified that values in association with products are created based on the evaluation between what is expected and what has been experienced. Satisfactory interactions are created when expected values meet perceived values and when such interactions are repeated and sustained over time, they become ‘accepted values.’ The research underlines ‘accepted values’ as values that can easily be shared with others and perceived that the tacit knowledge (or experience) shared during the design intervention session is part of their ‘accepted values.’ In principle, these values are grounded by one’s personal experience (value-as-action) and collectively shared among people (value-as-consensus). When desired by others, a compilation of these values can be transformed into capital; to be exchanged with monetary value or other comparable values agreed on by the stakeholders involved (value-as-capital). However, the concept of value-as-capital is not included in this analysis as the main focus of the research is the composition of values attributed to heritage products.

The composition of values in association with products is abstract, elusive, and susceptible to change (see 4.3.4). Insights from the General Descriptive Study (see 6.1.3) highlight the dynamic and complexity in identifying the influence of elements of local cultural heritage on both contemporary and traditional craft products. This research perceived that the influence of elements of cultural heritage could be identified by understanding, describing, and decomposing values inherent within local craft products. To operationalize this proposition, this research describes values of a product as a set of interrelated elements that comprises of Aesthetic, Interaction, Performance, Construction, and Meaning layers. Based on this theory, this research developed the MPV model and the PV canvas as a set of design tools used to explore values of heritage products (see 5.2.1). In this analysis, the content or values captured using these design tools—i.e. the statements mapped onto the PV canvas—are examined to identify the underlying network of connections within each layer.

7.2.1 The Method of Analysis and Empirical Data

To examine the statements mapped onto the PV canvas, the research performed a content analysis. Content analysis is a method commonly used to develop a conceptual model based on qualitative data. This method is selected because it offers a way to examine textual data by breaking the content into small units, classifying and coding them according to certain themes with the prospect of seeking, identifying, and determining trends and patterns (Vaismoradi, Turunen, & Bondas, 2013). Through this method, the richness and dynamic of a qualitative content can be examined in a

systematic manner (Krippendorf, 2004). The research adopted an inductive approach in which the categories are derived from the data. In this approach, the specific content is analyzed and then combined into a broader or general category (Elo & Kyngäs, 2008). In this subsection, the research presents and describes the process involved in performing this analysis: 1) Gathering and Preparing the Data, 2) Coding and Categorization, 3) Synthesizing the Categories as Themes, and 4) Managing the Quality of the Analysis.

Gathering and Preparing the Data

The statements mapped onto the PV canvases (or the session's artifacts) are the primary data used in this analysis (see 3.2.2). As mentioned in the chapter introduction, this analysis uses data from seven heritage products explored during the empirical exploration. All the heritage products were selected based on the criteria identified in subsection 5.2.1 which means these products are authentic to the local context, accessible to the participants, available during the design intervention session, and applicable for the overall implementation of the design workshop. Figure 7.7 presents an overview of the empirical data, specifically on the participants, the heritage products, and the mapped PV canvases. From the figure, the different number of participants involved in each case study can be seen. However, as this analysis focuses on identifying the themes and the underlying network within each layer of the MPV model, the numbers of statements or participants from each case study are not considered critical. Instead, all the statements mapped onto all the PV canvases are combined and coded according to the layers.

To prepare the data for the analysis, each statement on a sticky note—mapped onto the PV canvas—was converted into textual data. Each textual data is considered as a statement. During this conversion process, content with words or sentences from other languages, namely, Vietnamese, Malay, and Chinese are translated into English. The researcher received support from the participants or the key informants for the translation process. Sketched content is annotated and described according to the researcher's notes or session's recordings. Next to this, additional notes are included with statements that are too brief in order to provide context and meaning to an otherwise fragmented statement. Table 7.3 presents a summary of the number of statements mapped onto the PV canvases and each statement is considered as a unit in this analysis. The table shows a total of 383 statements were elicited from seven heritage products. From this set; 71 statements were assigned to the Aesthetic layer, 57 statements to the Interaction layer, 66 statements to the Performance layer, 109 statements in the Construction layer, and 80 statements to the Meaning layer.



Figure 7.7: The overview of the participants, the heritage products, and PV canvases from the case studies.

	Aesthetic	Interaction	Performance	Construction	Meaning	Total
Bird cage	4	3	3	6	3	19
Farmer's basket	3	2	1	3	3	12
Tea warmer	5	10	15	13	10	53
Water pitcher	6	4	5	10	11	36
Lion head	27	22	23	36	32	140
Bamboo mat	10	8	6	17	11	52
Clay roof tiles	16	8	13	24	10	71
Total	71	57	66	109	80	383

Table 7.3: The number of statements mapped onto the PV canvases

Coding and Categorization

The research uses an open coding to organize the statements. In open coding, headings are given to the textual data to describe its content; next, these headings are collected onto coding sheets and categories are then generated by grouping these headings (Elo & Kyngäs, 2008). The process aimed to reduce the number of categories by “collapsing those that are similar or dissimilar into broader higher order categories.” In essence, the main purpose of creating the categories is to enable the research to describe the phenomenon, to better understand the data, and to generate knowledge (Elo & Kyngäs, 2008). This approach is adopted in this analysis as it enables the research to contextualize values captured via the PV canvas, describe the underlying network of values inherent within each layer of the MPV model, and generate a better understanding on the capability and limitation of these tools.

To perform this analysis, the statements (textual data in Excel format) from each layer were imported into Atlas.ti for the coding process. Each statement was then assigned with a code to describe its content. During this process, the catalyst words from the MPV model were used to support the coding process (see 5.2.1); however, the codes were not limited to these catalyst words instead the codes were generated to best describe the statements. Once all the statements were assigned with codes, the research used the Network View tool of Atlas.ti to categorize and organize the codes. The Network view tool offers the means to categorize and establish a network of connections within all the codes visually. This tool supports the process of abstraction in which the research formulates “a general description of the research topic through generating categories” (Elo & Kyngäs, 2008). In this process, each category is named based on the characteristics of its content, sub-categories with similar content can be grouped as categories; categories can also be grouped as main categories (Elo & Kyngäs, 2008). Accordingly, this process “continues as far as is reasonable and possible (Elo & Kyngäs, 2008).” During this process, the codes were categorized to identify the emerging patterns and trends within each layer. Certain terms used for the codes were revised for better representations and understandings of the statements connected to it. For example, the term ‘Physical Outlook’ in the Aesthetic layer was revised into ‘Physical Features.’ Some codes were also combined when the statements were similar to each other.

Synthesizing the Categories as Themes

Essentially, the abstraction process offers the means for the research to synthesize the outcome of the coding process and identify the network of connections within each layer. In the abstraction process, the codes are categorized and constructed as a hierarchical structure within each layer. Within this structure, the categories within each layer are defined as the main-theme, theme, and sub-theme (Figure 7.8). At the end of a node structure, every category is connected to a group of statements that defined them.

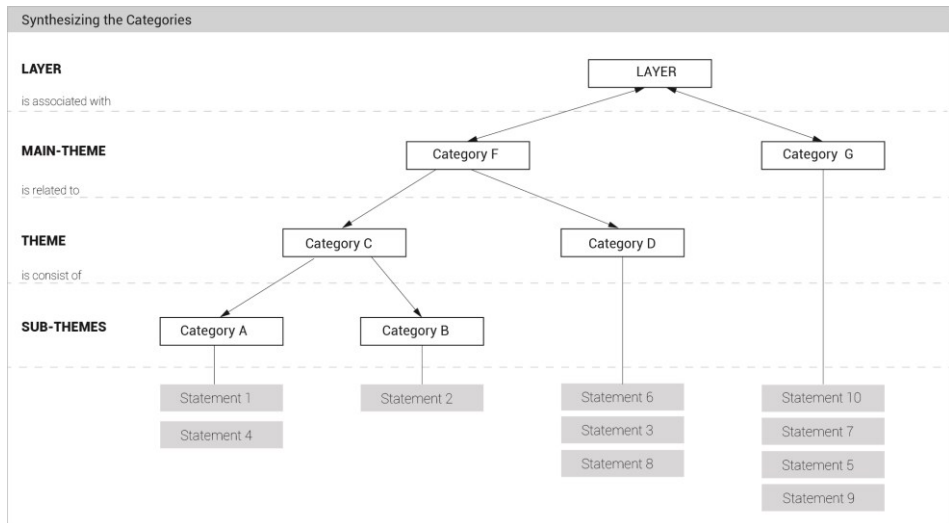


Figure 7.8: Synthesizing the categories as a hierarchical structure.

Managing the Quality of the Analysis

According to Elo and Kyngäs (2008), the trustworthiness of a content analysis can be established by describing the analysis process and results “in sufficient detail ensuring a clear understanding of how the analysis was carried out, its strength, and limitation”. Graneheim and Lundman (2004) discuss the means to establish trustworthiness of this method based on the evaluative criteria by Lincoln and Guba (1985): credibility, dependability, and transferability (see 5.3.1).

Credibility refers to 1) how the data and process of the analysis addressed the intended focus of the research, 2) how suitable the unit of analysis is, and 3) how well the categories cover the textual data, and 4) how similarities within and differences between categories are managed (Graneheim & Lundman, 2004). Regarding the first and second points, this subsection has presented the process of preparing the data and the unit of analysis used in the coding process. Next to this, the hierarchical structure including the all the statements in each layer were checked by another design researcher with product design background and experience within the craft industry. The main purpose of this evaluation is not to ensure that the data are coded in the

same way, the research rather aims to seek dialogue and find agreement among co-researchers on the result of the coding process. According to Graneheim and Lundman (2004), the intent of such approach is not “to verify that data are labeled and sorted in exactly the same way, but to determine whether or not various researchers and experts would agree with the way those data were labeled and sorted.” They highlight that the main point of the evaluation is establishing confirmability rather than verification.

Dependability refers to the instability factor of the data which is often influenced by the researcher, the way data is collected over time and the alteration made by the researcher during the analysis process (Graneheim & Lundman, 2004). To establish dependability, the research chooses the session’s artifacts (i.e., the mapped PV canvas) as the primary data for the analysis which were generated using the same tools and procedure and represents a tangible output created *in-situ* and together with the participants during the design intervention session. Next to this, each textual data point is directly connected to the statements mapped onto the PV canvas. Finally, *transferability* can be achieved through a detailed representation of the findings together with an appropriate quotation (Graneheim & Lundman, 2004). To enhance transferability, the research discusses the hierarchical structure for each layer with a representation of the statements that defined them in the following subsection. Additionally, the detailed results of the coding process can be found in Appendix 8 which consists of the hierarchical structure and all statements coded in each layer.

A successful content analysis means that the researcher managed to simplify the data and establish categories that reflect the focus of the research in a reliable manner; however, a content analysis is also flexible, and there is “no simple, ‘right’ way of doing it (Elo & Kyngäs, 2008).” In this subsection, the research has described in detail the steps taken in conducting this analysis and managing its quality. In the following subsection, the research presents the results of the analysis process which describes the underlying network of connections within each layer. The description includes samples of statements from each main theme that were extracted directly from the mapped PV canvas.

7.2.2 The Underlying Network of Connection in Each Layer

This subsection presents the results of the analysis according to the five layers of the MPV model. Each layer consists of a network of categories that are considered as a hierarchical structure. These categories are described as the main-themes, themes, and sub-themes. The research also includes examples of statements which have been mapped onto the PV canvas. As mentioned earlier, the detailed results of the content analysis can be found in Appendix 8.

Aesthetic Layer

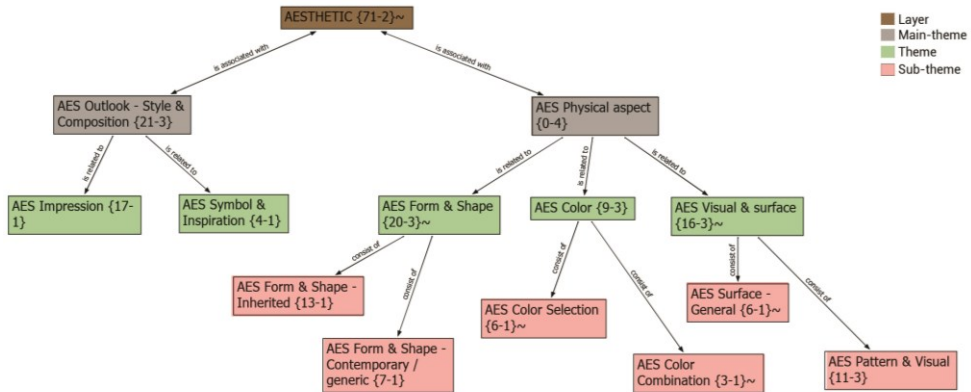


Figure 7.9: The network of categories for the Aesthetic layer.

In theory, the Aesthetic layer focuses on the tangible aspects of a product which incorporates elements such as form, composition, surface, and texture as well as graphic and decorations. Figure 7.9 shows that there are two main-themes identified in this layer (1) *Style & Composition*, and (2) *Physical Aspect* of a product. The first main-theme is associated with two themes. The first theme is related to the overall impressions of the product, for example, a product that is considered to be majestic and grand while another is considered simple and true to its material. The second theme consists of statements related to ‘symbols and inspirations.’ The lion head, for example, symbolizes a mythical character, and its outward appearance has been influenced by different types of creatures as its source of inspiration such as eagles, the zodiac sign of Leo, Phoenix as well as Godzilla. Figure 7.10 presents examples of statements extracted from this main-theme.



Figure 7.10: Samples of statements from the main-theme ‘Style & Composition.’

The second main-theme is associated with the *Physical Aspect* of a product. Statements related to this theme are classified into three themes. The first theme is related to ‘forms & shapes’ in which the statements are divided further into two categories, one

being forms and shapes that are inherited and the other is forms and shapes that are influenced by the contemporary elements. For example, the ‘*Ám Giành Tịch*’ (the Vietnamese tea warmer) has a design that never changes. In comparison, the form and shape of the ‘*Liép*’ (the bamboo mat) are being revolutionized and standardized for efficiency to meet the demand of the home-decor and interior market. The second theme relates to color which includes sub-themes related to the selection of hues and color combinations of the products. For example, the natural and earth-toned colors of bird cages, the neon colors incorporated onto the lion head and a tea warmer that represent the colors of Vietnam’s flag—red and yellow. Lastly, the third theme relates to the visual and surface design, for instance, textures and patterns of the products. The statements within the ‘patterns’ category consists of inherited as well as contemporary elements, for example, the ‘herring-bone’ and ‘checkered’ motif is identified as part of the traditional patterns for the bamboo mat while the ‘crazy-weave’ motif is part of the contemporary patterns. Figure 7.11 exhibits three examples of statements from this main-theme.

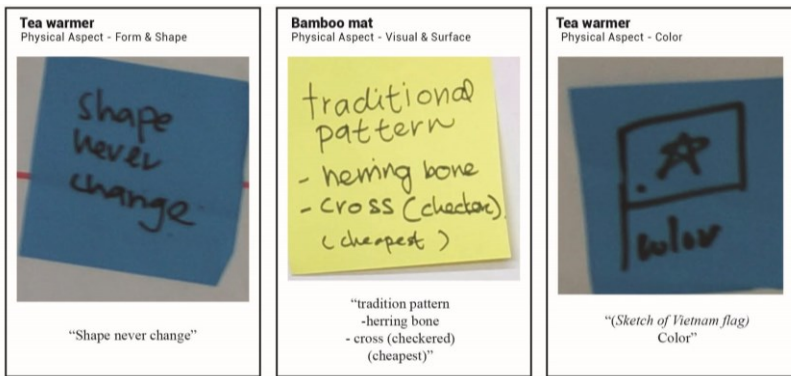


Figure 7.11: Samples of statements from the main-theme 'Physical Aspect.'

This result highlights that the composition of statements coded in the Aesthetic layer relates to products’ general style and composition as well as its physical aspects. In brief, the first theme revolves around product styles and impression while the second theme relates to products’ forms and shapes, colors, and surface designs. These two themes represent the values related to the tangible aspects of a product that are experienced by our sensory systems; notably, based on the empirical data, through our sight (vision) and touch (somatosensation).

Interaction Layer

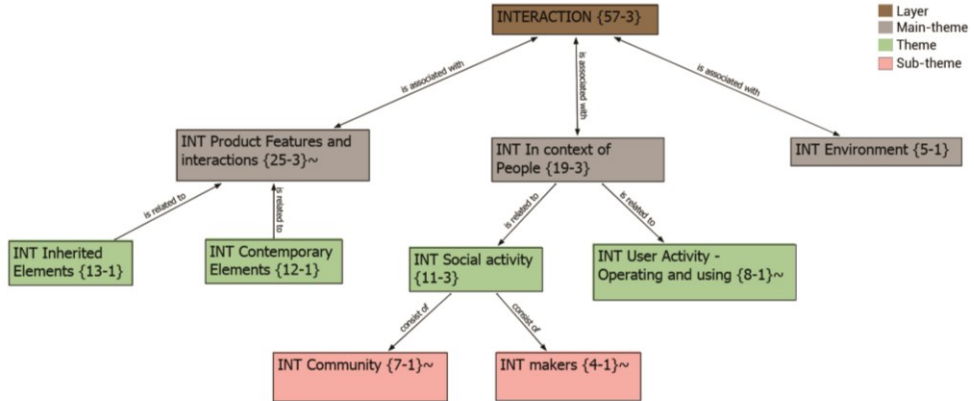


Figure 7.12: The network of categories for the Interaction Layer.

The Interaction layer relates to the interactions between a product and its user, for instance, the procedure of using a product, its ergonomic aspects, comfortability, movement, and ease of use. As shown in Figure 7.12, the analysis exhibits three main-themes associated with this layer (1) *Product Feature*, and product interactions (2) *In the Context of People*, and (3) *In the Context of Environment*. The first main-theme is classified into two themes; inherited and contemporary elements. The former is related to the products' traditional features—for example, the big basket which has always been shaped in a way that makes it 'easy to [be] lifted.' Another example is the multipurpose features of the *Liép*. For example, the bamboo mat can be rolled into a cylinder and used as a rice container, used flattened on top of the ceiling joists as a ceiling, or constructed vertically as a fence. Next, the second theme relates to the contemporary features of a product—features that are related to contemporary living. As an example, the *Liép* are transformed into a stronger material by layering, gluing, and pressing the mat with layers of acacia bark. This material is then used to make home-décor items, for example, boxes and vases. Figure 7.13 presents the examples of statements related to the first main-theme.

The second main-theme is associated with the interactions between products and the people. It comprises two themes. The first theme is related to the social or collective activities, specifically the community and the craftspeople. For example, the '*Ám Giành Tich*' embody a way of tea drinking that is unique to Vietnamese families and communities. The second theme consists of statements related to users' actions and experiences in operating or using a product, such as the steps and procedures of operating the lion head during a performance. Finally, the third main-theme is associated with products and the environment. The statements within this main-theme relate to places where a product is positioned or located. For example, the bamboo mat is used as part of spa interior whereas the big basket is often hidden from view in a

household. Figure 7.14 presents the examples of statements discussed the second and third main-themes.



Figure 7.13: Samples of statements from the main-theme 'Product Features.'

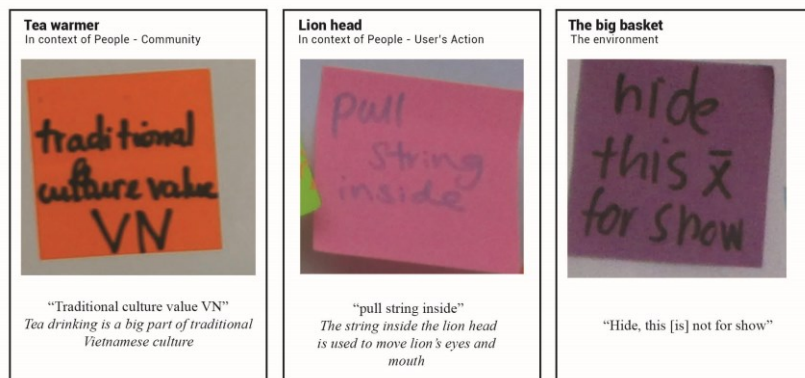


Figure 7.14: Samples of statements from the second and third main-themes.

From the results, it can be summarized that the statements collected in the Interaction layer revolve around the interactions between products, people, and the environment. Next to this, these values consist of both inherited and contemporary elements and these elements influence how a product is sustained and perceived by users, craftspeople, and the general community. In the context of people, the results demonstrate the different condition in which heritage products are used by the local people either individually or collectively. The statements highlight different communal groups such as a family, a village community, a local community as well as a country. In the context of the environment, the results indicate different places, orientations, and locations where heritage products are situated. In brief, the analysis indicates that the composition of values in this layer revolves around the interactions between products, people (individually and collectively) as well as the environment.

Performance Layer

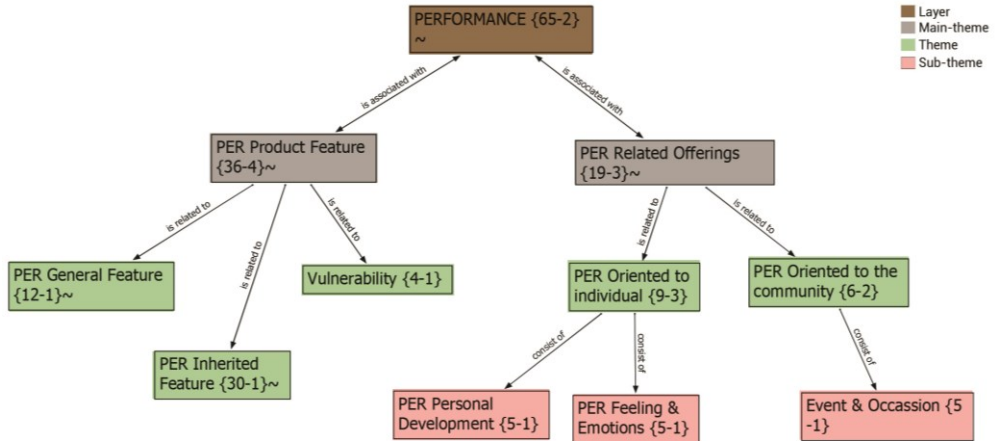


Figure 7.15: The network of categories for the Performance layer.

Performance is a layer that focuses on the capability of a product or its the functions. These aspects may include the specification, maintenance, quality, and standard. The analysis formed two main-themes: (a) *Product Feature* and (b) *Related Offering* to individuals and community (Figure 7.15). The first main-theme is expanded into three themes ‘contemporary feature,’ ‘inherited feature’ and ‘vulnerability’. The first theme, the ‘contemporary feature’ includes statements related to the new characteristics of a product. For example, the glue that is used in the bamboo mat is mixed with insect repellent to improve its resistance. This is a contemporary practice influenced by the commercialization of craft. This category also includes general characteristics of products, for example, sturdy, waterproof, and durable. The second theme, ‘inherited feature’ comprises attributes and characteristics of a product that are connected to the local and traditional aspects of a product. For example, the ‘*Sayong*’ water pitcher cools water naturally through its porosity. This knowledge and usage have been passed on for generations and it is also a valuable feature in a tropical country like Malaysia. The third theme, ‘vulnerability’, includes statements that highlight the weakness or problem related to the products, for example, the clay roof tiles that are easily cracked or get moldy over time. Figure 7.16 presents examples of statements related to this particular theme.

The second main-theme, *Product Offering* can be described as services or utilities provided by a product for individuals as well as communities. This main-theme has been expanded into two themes. The first theme is oriented towards offerings (or services) for individuals, for instance the lion head serves as a medium for dancers to develop their skills while the second theme is oriented towards the community, for example, the lion head also serves as a medium that symbolizes celebrations among the Chinese community. The offerings related to individuals also includes feelings and emotions, for example, the ‘*Ám Giành Tích*’ provides a sense of warmth and local

comfort while the lion head triggers the feelings of excitement, power, and energy. Figure 7.17 presents examples of statements extracted from this main-theme.

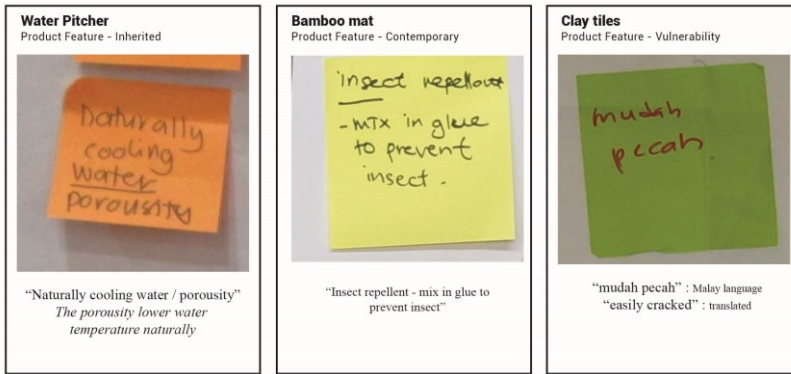


Figure 7.16: Examples of statements from the main-theme 'Product Feature.'



Figure 7.17: Example of statements related to the main-theme 'Product Offering.'

In summary, the first main-theme represents a compilation of product features that highlight the function or the capability of products. In principle, these features fulfill certain human needs based on the different product's characteristics. The second theme comprises of statements that are related to what a product offers but are not directly connected to the product characteristics, instead these offerings relate to people and their perceptions. For example, the lion head is a costume for a cultural performance—this is its basic function and also the reason for the product's initial creation. However, the use of this costume can influence its audience differently, for example, it may be considered as bringing good luck to a new business among the Chinese community yet to outsiders it can plainly be perceived as a source of entertainment or a cultural performance. Even though the lion head may provide different offerings to its audience, its features as a costume remain the same. It should be highlighted that the composition of values in this layer resembles the result of the two of the main-themes presented in the Interaction layer. Both layers exhibit a similar pattern in which the first main-theme consists of product features that are inherited as

well as adopted from the contemporary society. Also, for the second main-theme, both layers comprise of two sub-themes that are connected to individuals and communities. This insight suggests certain relationships or there might have been content overlapped between these two layers.

Construction Layer

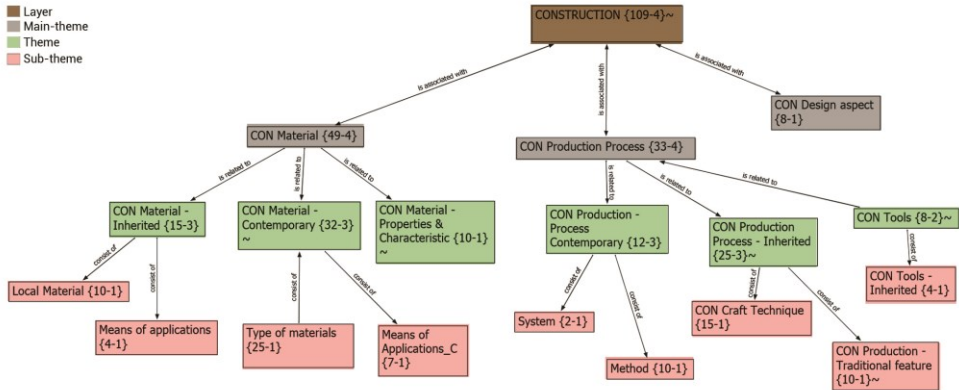


Figure 7.18: The network of categories for Construction Layer.

The construction layer focuses on the aspects related to the process of making. This includes types of material used, production techniques, skills and craftsmanship, and tools, as well as manufacturing processes. Figure 7.18 shows that there are three main-themes identified in this layer (1) *Material*, (2) *Production Process*, and (3) *Design Aspect*. The first main-theme *Material* is expanded into three themes which include statements related to (a) inherited materials (or traditional materials and its application), (b) contemporary material and its applications, and (c) materials properties and their characteristics. Figure 7.19 presents examples of statements from each theme.

The second main-theme, *Production Process* has been classified into three themes (a) contemporary process, (b) inherited process, and (c) tools. Contemporary process refers to production processes that are based on current technology while inherited process is associated with the production process inherited from the previous generations or traditional methods and techniques of making the products. For example, one of the statements related to inherited processes is using every part of material acquired in the production process. Another example is the pinching technique, a traditional pottery method used to make the Sayong water pitcher. However, this technique is no longer being practiced, having been replaced by the casting technique. The casting technique can be considered as a new technique in the village; hence, is categorized as part of the contemporary process. The third theme is related to the tools used in a production process, for example, plates that are used as a base to make a water pitcher or a cutting tool called '*pohon bonsai*' (bonsai tree) which

is used to cut raw clay. The third main-theme of this layer is the *Design Aspect* which consists of design elements that influence the process of product-making. For example, the designs of molds that are unique to various regions and the importance of stability and symmetry in the construction of a water pitcher. Figure 7.20 shows examples of statements related to this theme.



Figure 7.19: Samples of statements related to the main-theme 'Material.'



Figure 7.20: Examples of statements related to the main-theme 'Production Process.'

In summary, the result highlights that the statements collected in this layer consist of the basic elements found in production processes such as material, production techniques, skills, and tools. Similar to the previous layers, elements inherited from the previous generations and practices adapted from the contemporary society were identified. The first main-theme, *Material* has the most statements attached which refer to aspects related to inherited material (e.g., traditional material), contemporary materials as well as general properties and characteristics. The statements related to the *Production Process* include the properties of a product and its part, different stages for product assembly, the treatment processes, machines and tools, production time, manufacturing constraints as well as relevant stakeholders. Next to this, this layer also includes basic crafting skills, traditional craftsmanship, the fusion between the old and

new techniques methods, and the production quality. The statements mapped onto this layer encapsulate the notion of how a product is made, underlining its importance as one of the primary resources within the local craft industry.

Meaning Layer

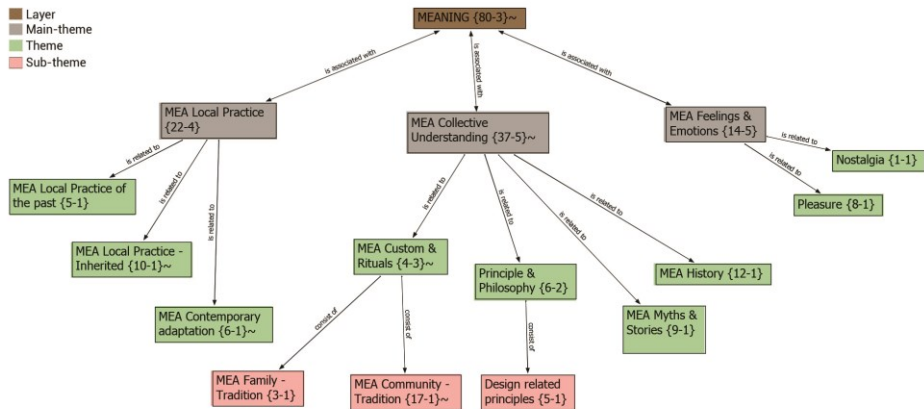


Figure 7.21: The network of categories in the Meaning layer.

In theory, this layer relates to the metaphysical aspects of a product which include human conducts, virtue, ethics, and philosophy. Next to this, the meanings of a product are also connected to local allegories, traditions, myths, histories, customs, and rituals. Figure 7.21 exhibits three main-themes identified in this layer: (1) *Local Practice*, (2) *Collective Understanding*, and (3) *Feeling and Emotion*. The first main-theme, *Local Practice* is associated with habits and activities among the local community. Statements within this main-theme are further classified into three themes. The first theme relates to the practices in the past which are no longer being practiced but are still part of the local memories. For example, the bamboo mats were used to construct a type of defense dome or blockhouse during times of war. The second sub-theme is connected to the practices that are inherited and still being practiced by the local community. As an example, the bamboo mats are still considered a common household item in the countryside. The third theme relates to the adaptation of heritage product in a modern context, for example, the bamboo mats which are used in modern construction sites. Figure 7.22 shows examples of statements related to this main-theme.

The second main-theme, *Collective Understanding* can be described as shared beliefs among the local communities. Statements coded in this theme are classified into four themes. The first theme is related to local customs and rituals, and can be associated with the traditional practices that are accepted in various levels, such as family, community, society and a country. For example, the daily use of the '*Ám Giành Tịch*' is considered as part of the practices of families that instill traditional values. The use of

this tea warmer also symbolizes the culture of tea drinking that is part of Vietnamese culture and traditions. For example, tea drinking is an essential ritual in welcoming guests, celebrating weddings, and conducting funerals. The second theme is 'myths and stories' which consists of statements related to age-old narratives that are known among the local community. For example, the lion dance performance practiced by the lion dance troupe is believed to originate from Guang Dong (a place in the East of China) and this cultural performance is linked to a poem by Bai Ju Yi, a poet from the Tang dynasty. The art of lion dancing is one of the most widespread folk dances among Chinese communities across the world with various narratives and origins. Therefore, the statements elicited during the session indicate the roots and narratives in connection to the Chinese community in Malaysia. The third theme, 'history' comprises of statements that are supported by certain known events or facts from the past. For example, in 1899, clay roof tiles following the design style from India were made for the construction of *Jugra Castle*, a palace for one of the ruling monarchs in the Peninsular Malaysia. The fourth theme is related to 'principle and philosophy.' For example, the bamboo plants are close to the heart of the Vietnamese as bamboo represents a community that is strong, sturdy and deeply rooted yet still flexible and resilient with strength to overcome winds and storms of challenges. Figure 7.23 shows examples of statements for this main-theme.

The third main-theme is *Feeling and Emotion*. This main-theme comprises statements that are related to personal expressions as well as communal perceptions. Two themes emerged from the analysis underlining the feelings of pleasure and nostalgia. For example, tea drinking is associated with warmth, relaxing and calming feelings. The lion dance gives a sense of joy, hope, peace, and blessing. Lastly, the '*Ám Giành Tịch*' triggers a nostalgic feeling, a memory of old Hanoi where people enjoy their tea under a shade with leaves falling from the tree. Figure 7.24 presents examples of statements collected in this layer.

In summary, the results highlight that the composition of statements collected in this layer relates to common practices which are connected to the local context, their tradition, local nuances, memories as well as feelings and emotions. The results also highlight shared values within the community, for instance, family practices, local traditions, rituals and customs, and also collective narratives. These narratives include mythological stories and historical narratives. These collective memories, as well as official narratives, seem to be part of the stories and memories attached to heritage products. This layer also highlights other metaphysical aspects of heritage products including life principles and old philosophies as well as human emotions, for instance, well-being, positive feelings and poetic sensibility.

This section has presented the result of the analysis of the statements mapped onto the PV canvases collected from the exploration of seven heritage products. The results presented the network of categories based on the main-themes, themes, and sub-

themes established in the five layers of the MPV model: Aesthetic, Interaction, Performance, Construction, and Meaning. In the following subsection, the research discusses how these results contribute to understanding the composition of values inherent within heritage products.

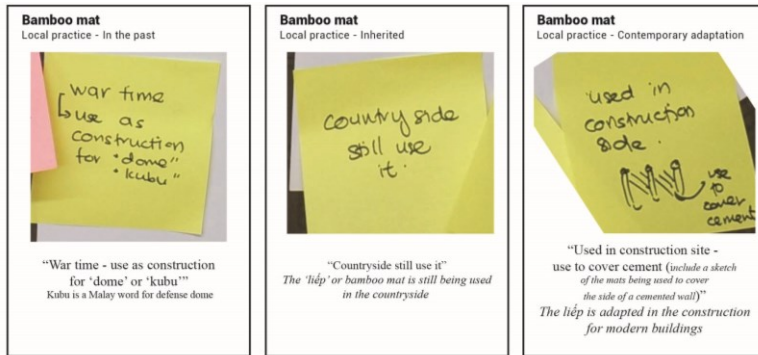


Figure 7.22: Examples of statements from the theme 'local practice'.



Figure 7.23: Examples of statements from the main-theme 'Collective Understanding.'

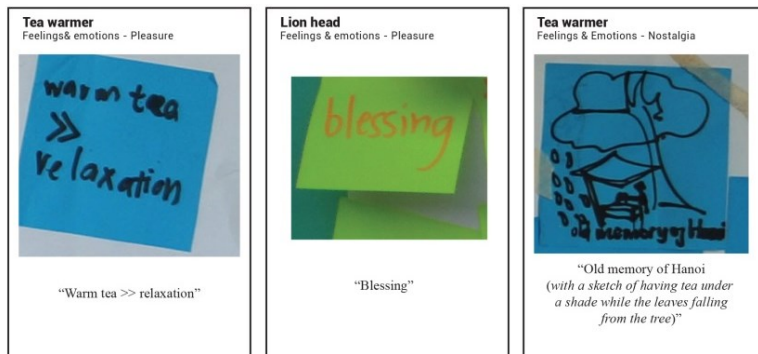


Figure 7.24: Examples of statements from the theme 'feelings and emotions.'

7.2.3 The Composition of Values of Heritage Products

This analysis is conducted to examine the composition of values in association with heritage products based on a set of interrelated elements or the five layers of the MPV model: Aesthetic, Interaction, Performance, Construction, and Meaning. Figure 7.25 presents an overview of the composition based on the network of categories identified in the analysis according to the main-themes, themes, and sub-themes. This hierarchical structure presents the means of understanding, describing, and nearly decomposing values associated with heritage product captured using the MPV model and the PV canvas. The results of the analysis suggest that although the composition of values associated with heritage products are susceptible to change, it can be explored as a set of interrelated elements independent of their individual content and presented as a hierarchical structure.

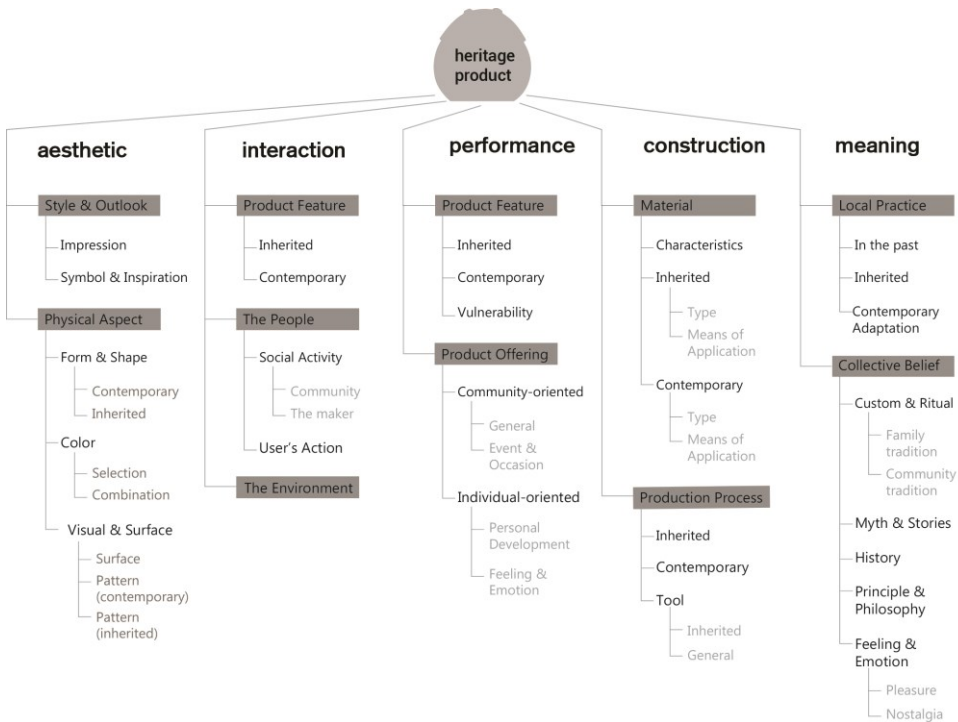


Figure 7.25: The overview of the hierarchical structure based on the five layers of the MPV model.

Theoretical discussions highlight that a hierarchical structure consists of a subsystem within a subsystem and this relationship continues until an elementary point is reached (see 4.3.4). This perspective also underlines that each subsystem can evolve and be analyzed independently. By viewing the composition of values of heritage products as a hierarchic structure, this research describes the underlying networks of categories (or subsystems) within each layer of the MPV model. Although the statements extracted from the PV canvas are considered as elementary points in this research, as discussed

in Analysis 1, each statement represents only the tip of the knowledge shared during the design intervention session. Hence, the statement can be isolated and explored further, independent of the main structure. Also, the networks of connections within this structure does not imply that a category is below or on top of another, instead, these networks of connections represent relationships among the categories. The hierarchical structure illustrated in Figure 7.25 is one of the means to describe the relationships of values inherent within heritage products representing common properties (or categories) that are related to each layer and can be independent of the statements.

In subsection 4.3.4, this research highlighted that the composition of values associated with products is multi-dimensional in nature, and identified eight different types of values (refer to Table 4.2): Hedonic, Utilitarian, Visceral, Credence, Symbolic, Community, Family, and Moral & Ethical values. Based on their theoretical descriptions, the research linked these types of values to the five layers of the MPV model (refer to Table 4.3). In Table 7.4, the research synthesized the different types of values in connection to the categories identified in the analysis.

- *Aesthetic Layer* – The research observed three different types of values in this layer: Hedonic, Symbolic, and Visceral values. As highlighted in the theory, the main values attributed in this layer are those connected to the visceral values or the physical aspects of products; namely, forms, shapes, colors, as well as visual and surface designs. Within these aspects, the research identified elements that are inherited from the previous generations and adopted from the contemporary societies. Apart from this, a product's styles and appearance that convey certain impressions to its audience are associated with Hedonic values while sources of inspiration that are significant to a group of people (e.g., community) are linked to Symbolic values
- *Interaction Layer* –The research observed Utilitarian, Community, and Credence values in this layer. Similar to the theory, the main type of values observed in this layer is utilitarian values which are connected to the products features inherited from the previous generation as well as those adapted from the contemporary societies. Elements related to individual interactions and the environments in which products are located are also linked to this type of values. Next to this, elements related to collective interactions are linked to the Community values for the community and Credence values for the makers.
- *Performance Layer* – The research observed Utilitarian, Community, Symbolic, and Hedonic values in this layer. Similar to the previous layer, Utilitarian values are associated with the product features, which include features that are inherited and contemporary, as well as the product's vulnerability.

Layer	Main-theme	Theme	Sub-theme	Type of values	
AESTHETIC	Style & Appearance	Impression		Hedonic	
		Symbol & Inspiration		Symbolic	
	Physical Aspect	Form & Shape	Contemporary		Visceral
			Inherited		Visceral
		Color	Selection		Visceral
			Combination		Visceral
		Visual & Surface	Surface		Visceral
			Pattern (Contemporary)		Visceral
		Pattern (Inherited)		Visceral	
INTERACTION	Product Feature	Contemporary		Utilitarian	
		Inherited		Utilitarian	
	The People	Collective Activity	Community		Community
			The Makers		Credence
		Individual Activity	Users' Experience		Utilitarian
The Environment				Utilitarian	
PERFORMANCE	Product Feature	Contemporary		Utilitarian	
		Inherited		Utilitarian	
		Vulnerability		Utilitarian	
	Product Offering	For Community	General		Community
			Event & Occasion		Symbolic
		For Individual	Personal Development		Utilitarian
		Feeling & Emotion		Hedonic	
CONSTRUCTION	Material	Characteristic		Credence	
		Inherited	Type of Material	Credence	
			Means of Application	Credence	
	Production Process	Contemporary	Type of Material	Credence	
			Means of Application	Credence	
		Inherited		Credence	
	Design Aspect	Contemporary		Credence	
Tools			Credence		
MEANING	Local Practices	In the Past		Community	
		Inherited		Community	
		Contemporary		Community	
	Collective Beliefs	Custom & Ritual	Family Tradition		Family
			Community Tradition		Community
		Myth & Story		Symbolic	
		History		Community	
	Feeling & Emotion	Principle & Philosophy			Moral & Ethical
					Hedonic
		Nostalgia			Hedonic
	Pleasure			Hedonic	

Table 7.4: Types of Values in connection to the categories established in the analysis.

This layer also includes product offerings for individuals as well as the community. Offerings for individuals are associated with Utilitarian and Hedonic values while those for the communities are connected to Community and Symbolic values.

- *Construction Layer* – The theory underlines the relevance of Credence values in this layer; similarly, the research observed elements that can be associated with Credence values, such as, the general characteristic of materials, material types and means of applications (inherited and contemporary), production processes (also inherited and contemporary), the tools used and the design aspects that are taken into consideration during the process.
- *Meaning Layer* –The theory underlines the connection to Hedonic, Symbolic, Community, Family, and Moral & Ethical values in this layer which were also observed in this analysis. Hedonic values are associated with feelings of nostalgia and pleasure. Community values are observed in relation to local practices in the past, inherited practices that are still retained as well as those adapted in contemporary settings. This type of value is also linked to the customs and rituals practiced at a community level. Similarly, customs and rituals practiced at a family level are linked to Family values. Collective beliefs that include historical narratives are linked to Community values and local principles and philosophies are connected to Moral & Ethical values.

The different types of values observed in the different layers showcase the complexity or multidimensional construct of values associated with products. This result reflects on Boztepe's view of products as a cluster of values that are gradually added at the different stages of product development, manufacturing, and distribution (2007). The result also suggests that values are attributed during product use as well as at the end of product life. Furthermore, these values continue to contribute to influencing the creation of new generations of similar products. This insight indicates that the composition of values associated with products oscillates and reforms the way in which new values are attributed, present values are retained, and some values might be discarded, while others are re-integrated in a slow, continuous process of change.

Both inherited and contemporary values were identified across all the layers. The latter represent knowledge that has been adopted through current development within the society and industry while the former is connected to the traditional knowledge or knowledge inherited from the previous generations. In subsection 4.2.1, this research highlights that traditional knowledge is part of the local cultural heritage and local craftspeople are one of the prominent bearers of such knowledge. In a way, values that are inherited represent the micro-narratives and memories of a local community. Results from this analysis suggest that such knowledge is inherent within heritage products; and through the participation of local craft stakeholders and the application

of the MPV model and the PV canvas, different aspects of knowledge associated with heritage products and inherited from the previous generation can be explored and identified in a structured manner.

The result also demonstrated that values in relation to people can be perceived as individual or collective. These values can be described as values-as-action and values-as-consensus (see 4.3.2). In brief, value-as-action is connected to individual experiences and value-as-consensus is linked to experiences shared among a group of people. This finding shows that values associated with heritage products embody the complex relationships that are made of individual as well as collective interactions between products and people. Next to this, the results from Interaction and Construction layers highlight the interactions between product and the environment, such as, the natural resources used to produce the products, and the surroundings and locations of the products.

7.2.4 Conclusion

Understanding the underlying structure behind the composition of values attributed to products provides a better understanding of its complexity. By exploring these values as a set of interrelated elements, the research has described these values as a hierarchical structure and identified the different types of values observed in each layer. These different types of values highlight the multi-dimensional nature of values inherent within heritage products based on the empirical data. By decomposing values according to these layers, the research managed to identify the values' mixture of inherited and contemporary values associated with heritage products in a structured manner. Using this approach, the abstraction and elusiveness of these values are reduced by exploring and mapping the compilation of values based on the five layers of the MPV model. This approach can be useful in understanding and differentiating current craft products in the market, for instance, by comparing a craft product that comprised of inherited values in all the layers of the MPV model with a craft product that comprised of inherited values only in the Construction layer. Such a method can provide a better understanding of the influence of cultural heritage in craft products (see 6.1.3). In essence, values that are inherited from the previous generations are part of the intangible cultural heritage. Safeguarding these values can potentially cultivate local knowledge, enhance communities' identities, develop better understanding on cultural diversity, and explore their potential adaptation as a resource for future development (see 4.3.1).

One of the critical aspects in initiating this effort to understand and identify what is to be safeguarded. Through the use of the MPV model and the PV canvas, this research has presented a method to understand, describe and nearly decompose the breadth and diversity of values inherent within heritage products. The findings discussed in this analysis contribute to the second proposition of this research:

Proposition 2a

The composition of values attributed to a heritage product can be understood, described, and nearly decomposed according to a set of interrelated elements that comprises of aesthetic layer, interaction layer, performance layer, construction layer, and meaning layer.

Final Proposition 2

The composition of values attributed to a heritage product can be understood, described, and decomposed according to a set of interrelated elements that comprise aesthetic, interaction, performance, construction, and meaning layers.

The compilation of values in each layer can be viewed as a hierarchical structure, identified as either inherited or contemporary and clustered as individual or collective.

As the composition of values inherent within a product oscillates over time, the result presented in this analysis represent only glimpse of the elements of values that are associated with heritage products. Bigger data collection based on the method presented in this research can offer a more robust understanding about the network of values inherent within heritage products. Future exploration can also benefit by focusing only on one heritage product or values that are inherited from the previous generations. Another aspect that needs to be investigated further is the compilation of these values as a capital that can be exchanged within various industries, for example, craft, tourism, and education.

In summary, the results of the analysis show that the use of the MPV model and the PV canvas allow values attributed to heritage products to be nearly decomposed into smaller categories (or sub-systems) based on the five layers of product elements: Aesthetic, Interaction, Performance, Construction, and Meaning. In principle, each category (sub-system) and each statement (elementary point) can be examined and explored independently. In this research, the statements mapped onto the PV canvas are further explored as a resource (1) to develop new product ideas (**P3a**) and (2) to elicit elements of sustainability associated with heritage products (**P4a**). These explorations are discussed in the following two analyses (sections 7.3 and 7.4).

7.3 Analysis 3: The Adaptation of Values of Heritage Products in New Design Ideas

Values of heritage products offer interesting input in the product development process. As discussed in subsection 1.2.2, the adaptation of culture-oriented content as a creative resource in the design process is not new to professional designers or the research communities. These adaptations can improve a product's identity, increase marketing values, enhance consumers' experiences, create product differentiations, and correspond to demands for unique and authentic products (see 4.5.1). In section 4.5, the potential use of culture-oriented content is discussed, namely, the intangible cultural heritage as a potential resource in designing for the future; it underlines opportunities to examine the process of adapting culture-oriented content, i.e., values of heritage products in the fuzzy front end of the product development process. To discern the link between elements of heritage products that are adapted in contemporary craft products, the research developed and implemented a set of design intervention sessions:

- *Session 1: Exploring Heritage Products*
- *Session 2: Design Direction Framework*
- *Session 3: Concept Generation*

In Analysis 1, the research discussed the exchange of knowledge about heritage products (*in Session 1*), demonstrating how the knowledge regarding heritage products is shared and transformed into explicit forms. In this third analysis, the research aims to investigate the adaptation of values of heritage products as a source of creative inputs in the product development process. The analysis seeks to discern the link between heritage products and new product ideas using statements mapped onto the PV canvas and selected for the Design Direction Framework. Primarily, this two-step process connects heritage products and the new product ideas, and enables the research to ascertain how values of heritage products can be consciously adapted to new design ideas. To do this, the statements from the PV canvas selected for the Design Direction Framework and the sketches of the new product ideas are examined, and the links between heritage products (the old) and the conceptual ideas (the new) are mapped.

7.3.1 The Method of Analysis and Empirical Data

To discern the link between heritage products and the new product ideas, this analysis maps the connection between heritage products, statements from the PV canvas that are selected for the Design Direction Framework, and the sketches of concepts generated during the idea generations sessions. Data from Case Studies 1, 3, and 5 were used in this analysis. To describe the method of analysis this subsection includes

1) Gathering and Preparing the Data, 2) Mapping the Connection, 3) Managing the Quality of the Analysis.

Gathering and Preparing the Data

In section 5.2 (*The Design Intervention Sessions*), the research has discussed the protocols and procedure for Session 1, 2, and 3, and Figure 7.26 presents the outcomes of the sessions that are used in this analysis: 1) the statements from the PV canvas (*PV statements*) selected for the Design Direction Framework, and 2) the collection of concept sketches generated during the Idea Generation Session. These two different types of session artifacts serve as the primary data for this analysis. As presented in section 5.2, by the end of *Session 1*, participants are asked to select three to five statements mapped on the PV canvas to be incorporated into the Design Direction Framework (*Session 2*). The statements selected from the case studies are illustrated in the figure below. The figure also includes the other exploratory sessions conducted in each case study. Although the outcomes of the individual exploratory sessions are not included in this thesis, the figure does illustrate the different design considerations taken in each case study and where Session 1 was conducted. Detailed content of the Design Direction Framework can be found in Appendix 9. Finally, in *Session 3*, participants are asked to sketch or write conceptual ideas based on the Design Direction Framework. Eighteen concepts were generated in Case Study 1 and 3 while in Case Study 5, twelve concepts were generated.

Mapping the Link of Connections

There are two specific procedures incorporated in *Session 3* that support the process of mapping the connection between the concepts and the statements. The first aspect was the adaptation of Brainwriting/Brainsketching technique which allows conceptual ideas to be generated in cycles. Using this procedure, concepts generated in each case study are in accordance with the number of participants and the cycles performed. For instance, three participants involved in three cycles of idea generations will create nine concepts. While the concepts were created individually, all participants used content from the Design Direction Framework as their reference. The second procedure is the brief presentation given by the participants at the end of each cycle. During the presentation, each participant presented their concepts and shared the different elements from the Design Direction Framework that influenced their ideas; these elements include the statements selected from the mapped PV canvas. Apart from allowing the participants to build on each other's ideas (R. Van Der Lugt, 2002), this procedure enables the researcher to record and map the links between the conceptual ideas and the statements from the Design Direction Framework. Also, it is not a strict rule that a participant can only generate one concept in each cycle thus the presentation also helps the researcher to keep track in case more than one concept was generated by a participant in each cycle. Once the connections were mapped, the concepts were classified based on the combination of statements linked to it. Figure

7.27 illustrates the process of mapping and grouping the conceptual ideas. The results of the mapping process are presented in the following subsection (7.3.2).

Managing the Quality of the Analysis

One of the key aspects in managing the quality of this analysis is the reflection on the different roles assumed by the researcher during the case studies and in the different design intervention sessions. In Session 1 and 2, the researcher took the role of a facilitator in the sessions. This means she mediated in the activities and the participants were responsible for the decisions made in these sessions. However, in Session 3 the researcher took an active role as a participant to generate new product ideas. One of the motivations behind this decision was to engage and encourage participants to share and propose their ideas, especially, to sketch their ideas on papers. Since sketching or sharing ideas visually is not a common practice among local craft stakeholders, this particular session needed more support in comparison to the other two sessions. The protocol and procedures established in the session clarified the role taken by the researcher as a participant: to generate new concepts based on the content mapped onto the Design Direction Framework. This decision was taken with reference to the theory of action research, mainly because it is part of the practical solution to issues concerning the context (see 3.1.1) which is the need for local craft stakeholders to develop new product ideas. According to (Argyris & Schön, 1989), participatory action research involves “practitioners as both subjects and co-researchers” with the aim of “creating an environments in which participants give and get valid information, make free and informed choices (including the choice to participate), and generate internal commitment to the results of the inquiry.” The analyses in this research focus on the sessions’ artifacts as the primary data; as mentioned in subsection 3.3.1, this data is chosen as it represents content that is created *in-situ* and together with the participants during the design intervention sessions. Detailed result of mapping the links between the values and the conceptual ideas can be found in Appendix 10.

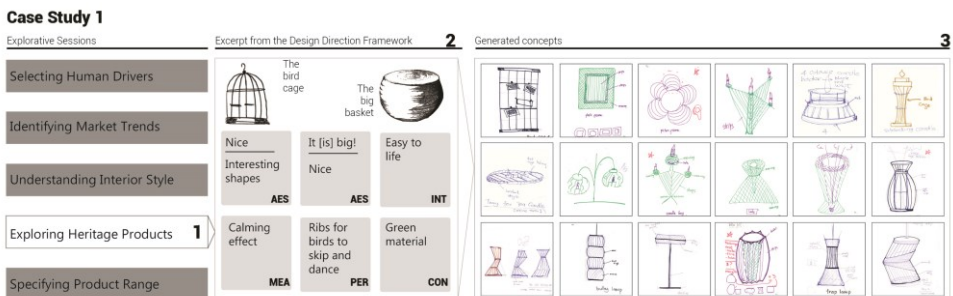
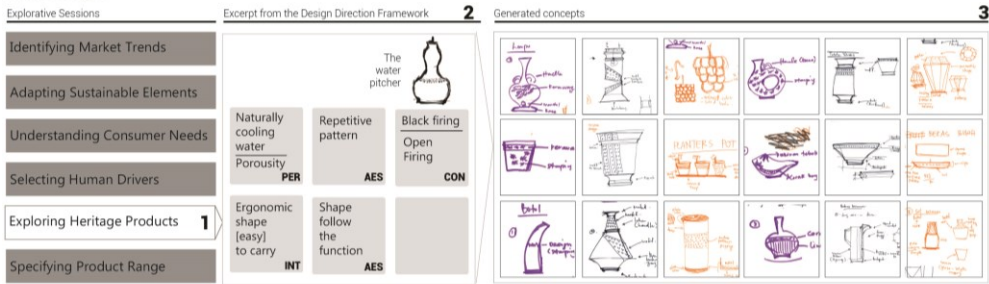


Figure 7.26: The overview of data from Session 1, Session 2, and Session 3
(continued on the next page).

Case Study 3



Case Study 5

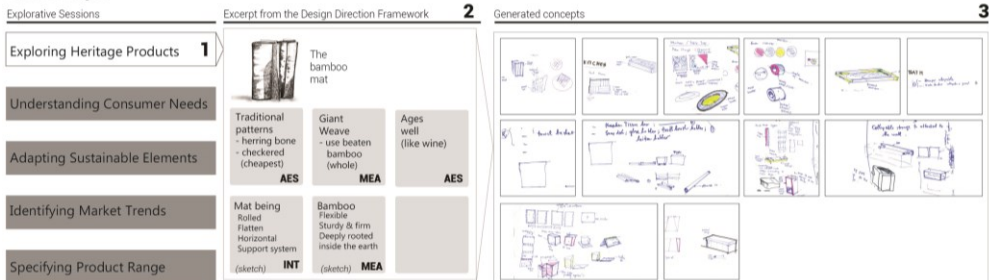


Figure 7.26: The overview of data from Session 1, Session 2, and Session 3.

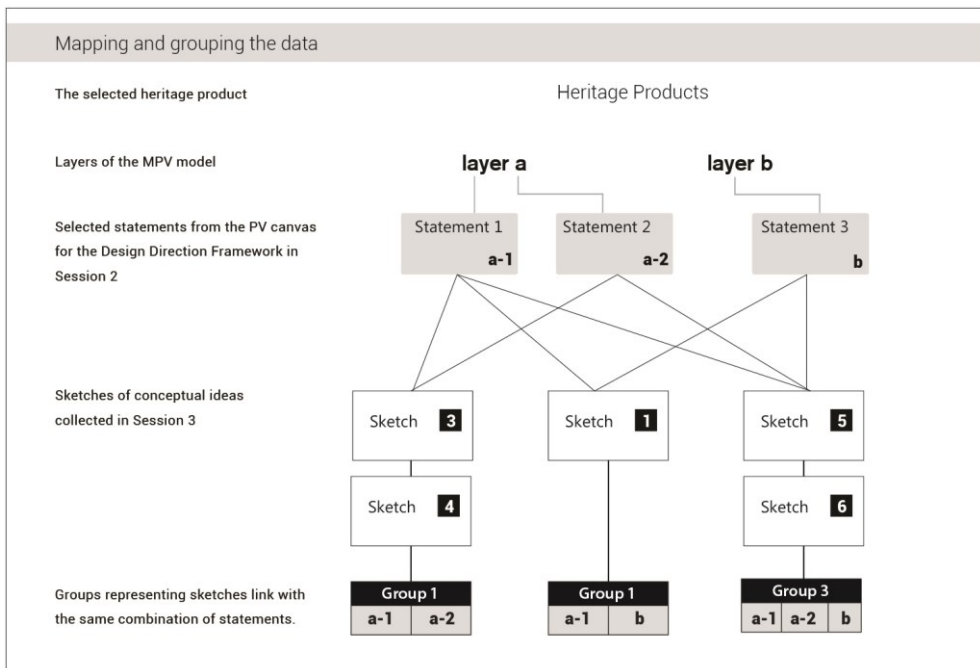


Figure 7.27: Mapping and grouping the sketches of conceptual ideas

7.3.2 Culture-oriented Content in the Product Development Process

When it comes to integrating culture-oriented content in the product development process, the discourse often focuses on the development of the physical products. However, the result from this analysis suggests that there are at least three different ways in which such content can be integrated into the product development process. Figure 7.28 illustrates these different levels of adaptation identified from the analysis: (a) product-level, (b) collection-level, and (c) company-level. Similar to the insights from literature (see 4.5.1), the product-level highlights the use of the values that are linked to a product concept, meaning the values that are translated into certain characteristics of a product. The result suggests that these translations can be generic as well as specific. For example, the statement referring to the ease of use of a product (in Case Study 1: **AES 2**) can be considered generic whereas the statement referring to the giant weaving technique (in Case Study 5: **MEA-1**) is regarded as specific. Furthermore, the result also highlights that these product features can be expanded into a series of products which is also related to the second level: collection.

LEVEL	THE STATEMENTS (Values of Heritage Products)						REMARKS	
Product	CS 1 AES-2 Big and gigantic product	INT Ease of use		CS 3 AES-1 Shape follow function	INT Ergonomic shape	CS 5 INT Multi-purpose	MEA-1 Giant Weaving	<ul style="list-style-type: none"> The values that are integrated in directly to a product concept. Can potentially be expanded as a key feature in a collection (subjected to the context of a project and decision from the stakeholders).
Collection	CS 1 AES-1 Exploring shapes	PER Lines and ribs of a bird cage	MEA Calm and serene ambiance	CS 3 AES-2 Repetitive pattern		CS 5 AES-1 Aged well	AES-2 Traditional pattern	<ul style="list-style-type: none"> The values that can be used as a key feature for a collection. The same feature can be integrated either to a number of products or used as part of the design principle for the whole collection.
Company	CS 1 AES-1 Green material			CS 3 PER Evaporative cooling	CS 3 CON Black firing technique	CS 5 MEA-2 The meaning of bamboo		<ul style="list-style-type: none"> The values represent the general values of a company or an organization. Can be integrated as part of the overall marketing content. Also connected to a place, a local community, a society, a country etc.

Figure 7.28: The different levels of adaptation in the product development process.

A product collection refers to a series of products comprised of similar themes or product features. The result highlights that at this level the values can be (a) adapted as part of a feature for some products within a collection or (b) utilized as a design principle during the development process. For the former, the adaptations are explicit and visible on the products, for example, the used of lines and ribs of bird cages (in Case Study 1: **PER**) or the adaptation of traditional patterns and techniques (for example, Case Study 3: **AES-2**). One of the advantages of this style of adaptation is that the selected value is explicitly accentuated to the audience (for example, buyers, customers) through a collection of products consisting of similar design language. As for the latter, the adaptations are implicit as the values are related to principles of know-how that are part of the local norms and daily practices. At times, these values are perceived to be common, hence, easily overlooked and at times undervalued. For

example, the different shapes of the bird cages in Vietnam (in Case Study 1: **AES 1**) and a product's surface that aged well (in Case Study 5: **AES-1**). Although these values are not explicitly adapted into the conceptual ideas they prompted discussions about such values in the context of future products. This insight highlights how a value extracted from a heritage product can be explicitly and implicitly adapted into various new ideas based on the association of its original (traditional) context as well as the new design directions.

Finally, the company level underlines that the values can also be general thus relatable to the practice within companies (or organizations and communities). In this context, these values have shown their potential to enhance companies' image or their brand values whilst being connected to the local heritage and cultural sphere. For example, in Case Study 1, exploring the characteristic of the materials used in producing bird cages that are considered as 'green' led to the discussion and identification of sustainable practices in sourcing materials by the company themselves. This association came into being as both the product and the company are related to bamboo—a material with significant values within the local cultural heritage as well as the craft industry. Some of these values are essentially part of the cultural identity of the bigger community or society, for example the use of black firing technique and the evaporative cooling from the water pitcher are part of the fundamental aspects of the '*Sayong*' community and their identity. Therefore, even when a company is adapting these values, their links to the place or community are not diminished. These different levels of adaption demonstrate the richness of resources inherent within heritage products and the possibilities of exploring these products as one of the creative resources in the product development process.

7.3.3 Heritage Product as a Creative Resource

The conceptual ideas generated in the case studies can be considered as part of 'culturally-oriented product' as the method developed in the research involved the interpolation of cultural elements in the new product concepts which is similar to the efforts by others (for example, Hsu et al., 2011; Lin, 2007; Luo & Dong, 2016). However, instead of exclusively identifying the approach as a specific design process, such as Cultural Product Design (CPD) (Lin, 2007; Luo Dong, 2016), this research incorporated culture-oriented content in a generic product development process (see Chapter 1, Figure 1.1.). Specifically, as one of the creative inputs in the fuzzy front end phase which includes various exploratory activities such as identifying market trends, understanding consumer needs, and selecting human drivers. By adapting the exploration of heritage products in this phase, the research presents an example of a structured approach where culture-oriented content is deliberately incorporated as one of the creative inputs in the fuzzy front end. This approach is an active approach to searching for inspirational stimuli; a conscious and deliberate method for acquiring information in the initial stage of the design process (see also 4.5.2). In essence, this

phase embodies efforts and activities in exploring opportunities, insights, ideas, and solutions. The early inclusion of culture-oriented content can influence and shape the direction of the product development process, creating an awareness of its potential for future living.

In essence, the use of cultural objects as an inspirational stimulus is not new; however, it is crucial for designers to be aware of the elements inherent within these objects that are adapted in their designs. Figure 7.29 illustrates the different forms of inspirational stimuli (in relation to the heritage products) identified in this analysis. As discussed in Analysis 1, knowledge associated with heritage products is closely connected to local craftspeople and often tacit in nature. During the *Session 1*, the knowledge associated with these products is shared and codified into explicit forms, or statements mapped onto the PV canvas. Some of these statements are extracted and included in the Design Direction Framework which was then used as a source of reference in generating new product ideas. This process presents the different forms of inspirational stimuli in relation to the use of heritage products as an inspirational stimulus.

As noted in the literature (see 4.5.2), Goncalves (2016, p.211) identified three forms of inspirational stimuli: visual, objects and textual. The results from this analysis show the different forms of inspirational stimuli which have contributed to the idea generation process and established the links that connect ideas to heritage products. This suggests that the adaptation of heritage products in the product development process does not necessarily rely only on the physical object, but it also includes different forms of knowledge associated with it which offer the means for an in-depth understanding about the selected objects. Based on this empirical result, this research suggests two essential factors when it comes to using heritage products (or cultural objects) in the design process: (a) the involvement of local people or experts on the product, and (b) the different forms of inspirational stimuli that offer an in-depth understanding of the selected cultural as well as creative resource.

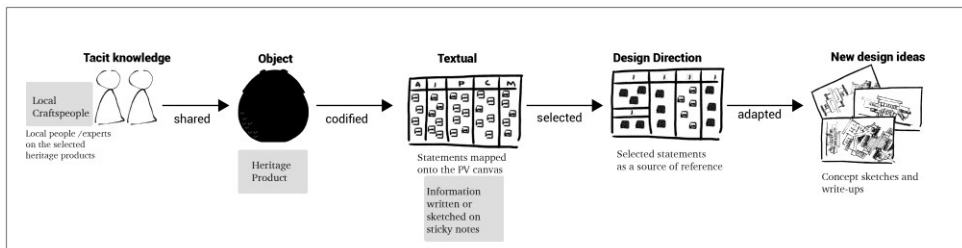


Figure 7.29: Tacit knowledge associated with heritage products is shared, codified, selected, and adapted in the product development process.

7.3.4 Conclusion

This research has presented a means towards a structured adaptation of culture-oriented content in the product development process. Through this approach, the research identified three levels of adaptation in which values of heritage products can be integrated into the process. Understanding the different ways of integrating the values of heritage products may provide a platform to support local stakeholders to make efficient use of their local cultural resources as a creative resource. This approach can be useful in supporting the effort of sustaining elements of the intangible cultural heritage of heritage products.

By establishing visible connectors in the approach, the research presents the links that connect conceptual ideas to specific heritage products. These connectors highlight the transformation of tacit knowledge associated with these products into explicit forms as well as their selection and adaptation into new design ideas. This deliberate inclusion of culture-oriented content in the early stage of the design process enables this research to trace values of heritage products that were adopted in contemporary products. Overall this approach contributes to a conscious adaptation of culture-oriented content as a creative resource in the product development process (see 4.5.2), and can potentially create a platform for the voice of inheritors or “carriers of local cultural heritage to be heard—literally and metaphorically (Galla, 2008). Further exploration concerning such effort can also promote a new role for design stakeholders: as agents involved in sustaining the intangible cultural heritage.

In brief, this analysis has discussed an area of application in which values of heritage products can be useful as a creative resource in the product development process. The process of sharing, codifying, selecting, and adapting values associated with heritage products in the product development process enables the research to discern the link between culture-oriented content and new ideas. The findings discussed in this analysis contributed to the third proposition of this research:

Proposition 3a

Values of heritage products can be used as a creative resource via a structured approach that includes the participation of local craft stakeholders and the deliberate inclusion of heritage products as an input in the fuzzy front end of the product development process. The approach promotes an inclusive and conscious adaptation of culture-oriented content in new design ideas.

Final Proposition 3

Values of heritage products can be used as a creative resource via a structured approach that includes the participation of local craft stakeholders and the deliberate inclusion of heritage products as an input in the fuzzy front end of the product development process. The approach offers three levels of adaptation in which values of heritage products can be adapted in the process: product-level, collection-level, and company-level.

Through this analysis, this research has presented a conscious adaptation of culture-oriented content in product development process. In principle, the procedures developed in the design intervention sessions provided the means for the research to collect data in different case studies settings and also influence the outcomes presented in this analysis. The aim of this procedure was to explore how a deliberate inclusion of heritage products in the product development process influences the outcomes. This analysis has shown that the outcomes—i.e., the adaptation of values of heritage products—are not limited to product concepts but also be applied to the collections, as well as other complementary business content, such as marketing story and brand image. Essentially, these adaptations can be traced back to a tangible representation of the local cultural heritage—heritage products. Additionally, values that were adapted and discussed in this analysis represent only a small fraction of the composition of values inherent within heritage products indicating richness of resources inherent within local heritage products.

The research recommends that the effort of adapting culture-oriented content as a source of inspiration should be expanded towards identifying such content as source of reference. Through such efforts traditional knowledge adapted in contemporary designs can be recognized and traced to its source of origins. Enabling such systems can be meaningful not only for designers and craftspeople but also a useful platform to inform consumers about the different values of local cultural heritage that have been adapted in their everyday objects. Such a mechanism can offer the adaptation of values of cultural heritage in contemporary products while making them visible and well-referenced.

7.4 Analysis 4: Eliciting Elements of Sustainability inherent within Values of Heritage Products

This analysis explores the second area of application for values of heritage products: eliciting elements of sustainability inherent within values of heritage products. In Case Study 2, the participants classified thirteen out of fifty-two statements mapped onto the PV canvas as connected to sustainability. The classification process was based on the participants' knowledge and experience in a sustainable product innovation project (see 6.3.2 and 6.4). To explore this insight further, the research generated the Framework of Sustainable Elements (FoSE) (see Figure 4.14) based on the synthesis of four existing design for sustainability approaches (see 4.6.2). The framework serves as an indicator to elicit elements of sustainability inherent within values of heritage products.

In subsection 4.6.1, the research discussed the present context of sustainability and proposed that one of the means to break away from the current unsustainable conditions is to elicit and nurture existing practices that instill and promote sustainability. Would it be possible to leapfrog and evolve differently from the culture of consumption? Ehrenfeld and Hoffmann (2013) are proponents of these ideas, and they also instigate that if age-old ideas can help cultivate a sustainable society, there is no reason not to restore or reclaim them in our everyday life. One of the advantages of eliciting existing elements of sustainability is that the notion of injecting a new cultural practice can be difficult as people can be very conservative in their behavior (W. Rees, 2010). However, awareness and understanding on how these practices contribute to the development of a sustainable society are still nascent, especially among the local communities within the emerging countries. To initiate such efforts the understanding of local cultural practices is vital before identifying sustainable practices from the past for our future living. Results from Analysis 2 suggest that heritage products comprise a diversity of values which are a compilation of experiences attributed over time and across generations. This research attempts to make this process visible by exploring the tacit knowledge shared about a selected heritage product. In this process, values associated with the products are mapped onto the PV canvas. In this analysis, these values (or statements) of heritage products are examined to elicit values that can nurture a sustainable way of living.

7.4.1 The Method of Analysis and Empirical Data

To elicit elements of sustainability inherent within the values of heritage products, a combination of methods has been adopted, namely: theory proposition (introduced in Analysis 1), content analysis (introduced in Analysis 2), and pattern matching and logic models proposed by Yin for case studies analysis (Yin, 2014). The method for this analysis involves a content analysis performed on the empirical data and a pattern matching in which results of the content analysis are matched to a theoretical proposition. The step process of conducting this analysis is akin to logic models in

which the empirical data is matched to existing theories in sequential stages (Yin, 2014, p. 155). In this subsection, the process of performing this analysis is described: 1) Gathering and Preparing the Data, 2) Coding and Pattern Matching, 3) Contextualizing the Result, and 4) Managing the Quality of the Analysis.

Gathering and Preparing the Data

The statements mapped onto the PV canvases represent the empirical data while the Framework of Sustainability Elements (FoSE) is the content from theoretical exploration; both are essential in this analysis. The analysis was performed based on four case studies clustered according to the type of material of the products: a) forest-based products from Vietnam (Case Study 2 and 5), and b) earth-based products from Malaysia (Case Study 3 and 6). In Analysis 2, the research has presented the process of preparing the statements mapped onto the PV canvas for the content analysis (see 7.2.1). The same data is used in this analysis, and Figure 7.30 presents an overview of the heritage products analyzed in this analysis. The summary of the mapped PV canvases and the number of statements identified in each case study can be found in subsection 7.2.1 (Figure 7.7 and Table 7.3).



Figure 7.30: Two clusters of heritage products based on material.

Coding and Pattern Matching

This analysis can be divided into four stages: the implementation of *Session 1: Exploring Heritage Product*, 2) the compilation of statements mapped onto the PV canvas for each heritage product, 3) the deductive content analysis based on the FoSE parameters, and 4) the pattern matching between the statements coded in each parameter to elements of sustainability in FoSE. Figure 7.31 illustrates these sequential stages and shows the outcomes: a description of the elements of sustainability inherent within values of a heritage product.

In reference to Figure 7.31, the procedure and outcomes of Stage 1 and Stage 2 have been introduced in Analysis 2. In Stage 3, different from Analysis 2, a deductive content analysis was performed instead of inductive analysis. A deductive content analysis is a method used to retest existing data in a new context based on a specific categorization mix (Elo & Kyngäs, 2008). In brief, the data is coded according to the

Sequence of Stages

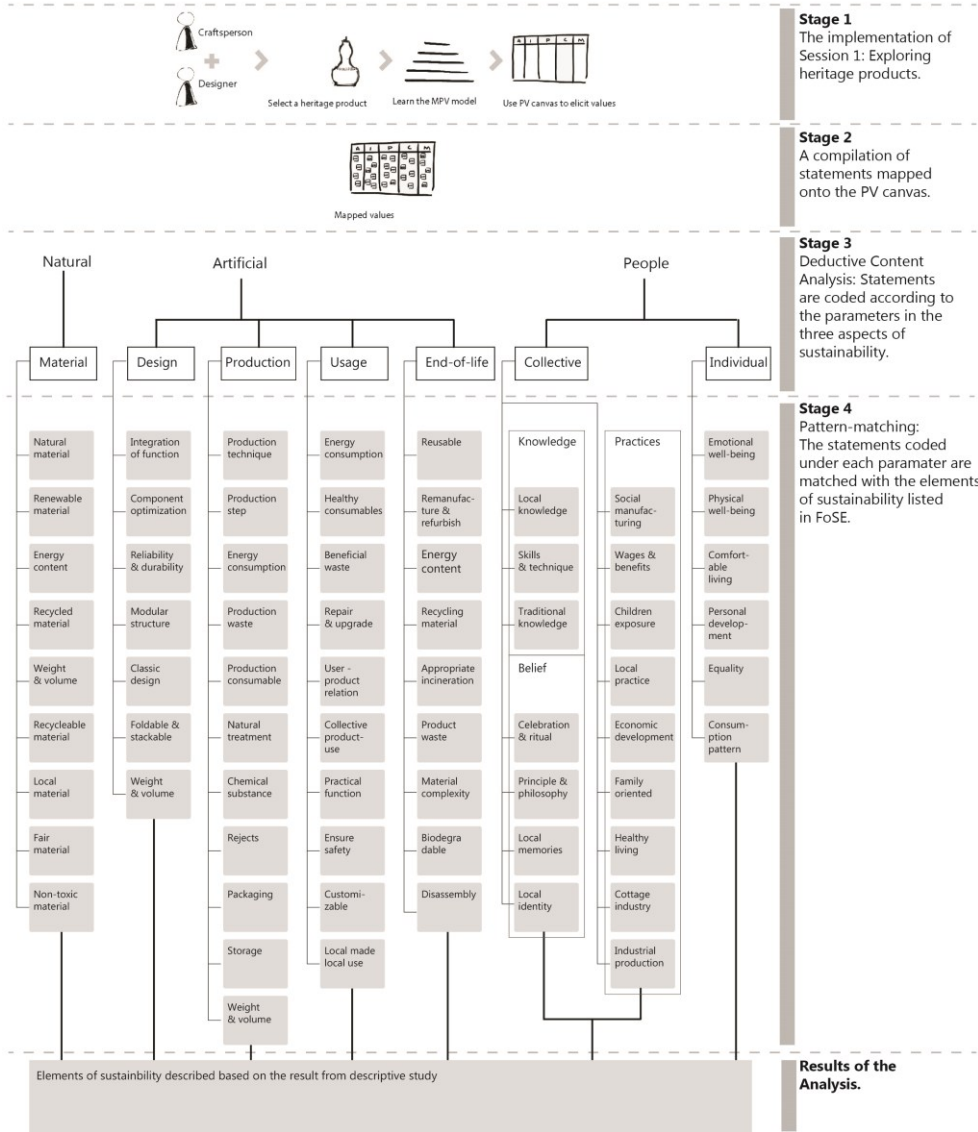


Figure 7.31: Sequence of stages in conducting the analysis.

categories established during the theoretical exploration. In this context, the statements mapped onto the PV canvas are coded according to the parameters (or categories) established in the FoSE. In Stage 4, the outcomes of the coding process are matched to the elements identified under each parameter based pattern matching method. Using this method, an empirically based pattern is matched with the predicted one made from existing theories (Yin, 2014, p. 142); in this research, the pattern matching was conducted between the statements coded under each parameter and the elements of sustainability listed in the FoSE.

Contextualizing the Result of the Analysis

Once the compilation of statements from each heritage products is matched to the elements of sustainability listed in FoSE, the results are contextualized according to the insights gathered during the General and Specific Descriptive Study as well as in connection to the theories (see 4.6). According to Yin (2014, p. 152), adding contextual conditions is an integral part of logic models as it provides an in-depth understanding of the results in a case study. Using this method, the different elements of sustainability inherent within values of heritage products are elicited. In essence, this process is performed based on the context of the product as part of the artificial environment, its interactions with people (individually and collectively), and the natural environment are described. The first aspect, '*natural*', refers to the ecological elements and natural resources. The second aspect, '*artificial*', refers to elements of the world with evidence of human artifice (see 4.3.2) which includes the process of designing, producing, using, and managing the end-of-life of a product. The third aspect, '*people*', refers to social networks that include both collective as well as individual interactions.

Managing the Quality of the Analysis

To manage the quality of the analysis, the tactics described in Analysis 2 are used as a reference. To establish the trustworthiness of the content analysis and the pattern matching, the research describes in detail how the process was conducted and presents the outcomes of each stage. The detailed results of Stage 3 (the deductive content analysis) and those of Stage 4 (pattern matching) can be found in Appendix 11.

To establish *credibility*, the research has discussed the process of preparing the data and the unit of analysis in Analysis 2. The results of the content analysis and pattern matching are clustered based on the countries, and each cluster is shared with a local designer with experience in the craft industry. Similar to Analysis 2, this evaluation was conducted to seek dialogue and agreement among designers on the results of the content analysis and pattern matching, thus establishing confirmability rather than verification. In the following subsection, the research discusses the results of the analysis.

7.4.2 Elements of Sustainability in a Heritage Product

This analysis explores the second area of application for values of heritage product: as a resource to elicit elements of sustainability inherent within heritage products. In this analysis, this research presents the elements of sustainability in connection to the statements mapped onto the PV canvases for four heritage products: *Ám Giành Tích, Liép, Labu Sayong*, and *Atap Singgora* (Figure 7.32). One of the motivations behind this exploration is to explore the roles of design as a medium to seek existing elements of sustainability embedded in heritage products, primarily those that are part of the intangible cultural heritage and that promote a sustainable way of living. The findings from this exploration can be used as a platform to seek and learn about traditional values that cultivate sustainable practices. Such an approach can play a role in reclaiming, restoring, and enhancing these values for the future.

Figure 7.32 presents an overview of the different elements that were matched to a selection of values from each heritage product. The detailed result of the statements in each element can be found in Appendix 12. In brief, the elements listed in the figure were connected to values (or statements from the PV canvas) of either one or a combination of the heritage products. In principle, these elements consist of a set of values that have the capacity to instigate the awareness about values which in turn can contribute towards either a flourishing future or a languishing one. It is important to emphasize that the objective of this analysis is not to identify if one or all of these heritage products can be considered to be sustainable or not. Instead, this analysis aims to elicit values that have been attributed to these products and identify those that can promote a sustainable way of living. In section 4.6, this research noted that products that have lasted so long should be sustainable in some way. In this analysis, the research identified the values of heritage products that are connected to elements of sustainability associated with products.

7.4.3 The Three Tangible Aspects of Sustainability

In this subsection, the research discusses the elements of sustainability shown in Figure 7.32 based on the three tangible aspects of sustainability: the natural, the artificial, and the people. As discussed in subsection 4.6.1, these three tangible aspects are connected through interactions, for instance, economic and culture activities which stem from human interactions. This research proposes that these aspects need to be in equilibrium for “the possibility that human and other life will flourish on earth forever (Ehrenfeld, 2008, p. 49)” and the intangible aspects i.e. human interactions can influence this equilibrium by disrupting, establishing or maintaining the balance.

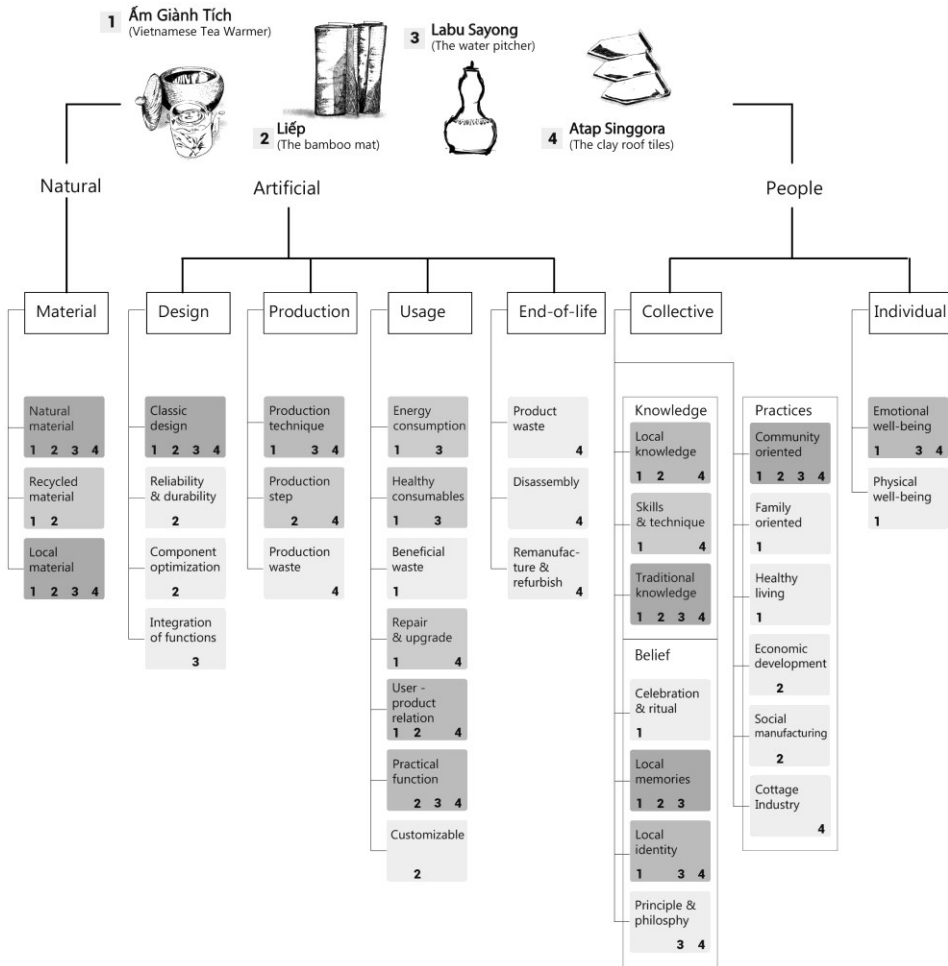


Figure 7.32: Summary of the results from the analysis.

The Natural Aspect

This aspect refers to the natural environment which includes the ecological components of our planet and focuses on sustaining the vitality and health of our natural capital (see 4.6.1). McElroy & Van Engelen (2012, p. 34) underline nature as a capital that provides life sustenance for humans to live as well as material resources for our artificial environment. Types of material are one of the ways to classify craft products (Che Pa, Bachik, Mohamed, & Ismail, 2012) and the products selected for this analysis are classified as (a) forest-based products, and (b) earth-based products. As shown in Figure 7.32, all heritage products explored in this research are mainly made of local and natural materials. These two elements are integral in the creation of folk products which are originally made by local people for their daily needs (see 4.2.1). One of the fundamental principles in the creation of folk craft is the adaptation of what nature has to offer rather than focusing solely on human needs (Yanagi, 2013, p. 215).

However, the contexts of these heritage products as folkcraft have evolved together with the commercialization of craft.

As folk products become part of the local craft industry, they are manufactured in masses and sold in various markets, locally and internationally. When local materials are sourced to meet the demands of the global market—without a proper and responsible means to manage the supply and demand—it will inevitably put a strain on the local natural resources. The use of local and natural materials without identifying their capability to remain in a state of equilibrium may jeopardize the health and vitality of local natural resources. Material shortages for plant-based materials are already an issue in Vietnam. Currently, these materials have been imported from other countries such as Laos, Indonesia, and Cambodia. The acceleration of economic development, notably in the craft and furniture industry can lead to over-exploitation of forest resources, resulting in the depletion of local-based materials. Material shortages were not an issue in the past when craft products were solely made for local consumption. Nevertheless, materials such as bamboo and rattan are renewable materials; with proper forest protection models and sustainable natural resources management, plant-based material can be cultivated into a fair and legitimate source of supply which promotes economic development as well as ecological sustenance.

The analysis also identified the use of recycled material in *Ám Giành Tích* and *Liếp cột*. In the tea warmer, this was practiced at an individual level as part of the traditional way of living. For the pressed bamboo, the practice is part of a sustainable manufacturing system; hence it is operated at an organizational level. Recycling practices at an individual and organizational level can contribute to reducing the burden on our natural resources.

In summary, this discussion highlights the effect on the transformation of folk products into commercialized craft products and their impact on the local natural resources. Yanagi (2013) stated that *“the closer we are to nature, the safer we are; the further away, the more dangerous (p.215)”*. In this sense, sustaining and safeguarding local and natural resources as well as making efficient use of available materials can cultivate practices towards a sustainable society. Moreover, sustaining values that have been practiced for generations can also be part of the effort in safeguarding the intangible cultural heritage.

Artificial Aspect

Heritage products are part of the artificial environment which is defined as material objects, physical systems, or infrastructures created by humans (see 4.6.1). Simon (1969, p.2) mentioned that *“the world we live in today is much more man-made, or artificial world than it is a natural world.”* This statement was made 48 years ago, and it remains as true now as it was then. Graeber (2001, p. 57) describes that the creation of the artificial is related to our basic needs to survive, however, *“the act of producing*

in order to meet such needs will always create new needs (Marx & Engels, 1970)." Folkcrafts are created by the previous generations for their survival; hence, this interaction can be characterized as utilitarian. As shown in this analysis, over time, such a product can still be produced albeit for various other reasons and needs, for instance, economic, spiritual, cultural, as well as to meet the current trends and lifestyle.

In the *Design* parameter, *classic design* is associated with all four heritage products. Traditionally, all these products are anonymously designed, created out of necessity and closely connected to the local community (see 4.2.1). This element indicates products that are simple, basic, functional, minimal, true to their material and subtle with natural tones. These features can influence the longevity of a product as they are less likely to incorporate trendy or seasonal features. These features are part of anonymous design endorsed by Naoto Fukusawa who suggested that a good design should be anonymous and dissolve into the behavior (see 4.5.1). Moreover, these features can also minimize production steps as well as reduce or eliminate additional components or substances in a manufacturing process. The analysis also identified other design elements, namely, *reliability and durability*, *component optimization*, and *integration of functions*. Although these elements are common in contemporary design, this result shows the presence of such design elements in heritage products as well.

For the *Production* parameter, the result indicates that the production technique and production step comprise both traditional and contemporary practices. The results suggest that the *Ám Giành Tích* and *Atap Singgora* retained the traditional production process which involved sustaining and maintaining methods inherited from the previous generations. This practice relates to the approach of *craft-as-culture* in which the products become a medium of expressions by a craftsman (see 4.2). Traditional methods involve longer production times and require more time to develop the skills and craftsmanship. *Labu Sayong* and *Liép* adopted new processes. In both adaptations, the processes increase productivity, reduce manufacturing time, and include the use of chemical substances. This contemporary practice refers to the adaptation of new technology and modes of productions. They are often influenced by the needs to increase production capacity, catering to market expansions that more often than not, demand quantity over quality. These traits resemble the approach of *craft-as-industry* as proposed by Mohlman (1999). This research emphasizes the importance for craft stakeholders to understand the different values in their production practices as both offer benefits as well as threats in relation to sustainability. One offers slow and meaningful processes that contribute to sustaining and safeguarding the local cultural heritage and the other offers efficiency and effective processes that promote local economic development.

In the *Usage* parameter, the result shows elements relating to energy consumption, healthy consumable, beneficial waste, user-product relations, practical functions, and customizable. The practical function is associated with the characteristics of folk crafts. Apart from their traditional functions, the results also suggest an evolution in their usage, for instance, the functions of the Liép and the Labu Sayong have evolved over time, however, the function of the Âm Giành Tích and Atap Singgora have remained the same. Next to this, the result also presents the practice of energy consumption that is frugal and in harmony with nature, for example, utilizing an evaporative cooling system to ventilate a home and to keep water cool in a tropical climate as well as using natural and recycled materials as insulation to keep warm. These findings are not primarily about using less or more energy, but they represent how heritage products are designed and created with a deep understanding of the user's needs as well as the surroundings. Apart from this, the element beneficial waste presents an example where used tea leaves are traditionally used as compost to treat plants. In brief, these results indicate that heritage products are comprised of values that support sustainable consumption, for example, in the use of energy, healthy consumptions, finding benefits for waste, offering repair and upgrade, and customizations.

In the last parameter, *end-of-life*, the result only identified elements that are associated with *Atap Singgora* which include the use of the product waste for remanufacturing. Apart from this, the design of this folk product is easy to disassemble. Folk products tend to be simple in their function, production processes, and material selections. The simplicity of these products can also be perceived as a capability to meet human needs without being excessive.

The People Aspect

This last aspect, *People* is expanded into two parameters; *collective* and *individual*. Krippendorf (1989) highlights that objects are part of our everyday necessities, we engage and communicate individually as well as collectively. This aspect also relates to human and social capital as mentioned by McElroy & Van Engelen (2012, p. 34). The latter comprises 'shared knowledge and organizational resources,' and the former relates to 'individual knowledge, skills, experiences, health, and ethical entitlements' (see also 4.6.1).

The *collective* parameter is divided into knowledge, belief, and practices. In relation to knowledge, the research elicited elements related to *local knowledge*, *skills & techniques*, and *traditional knowledge*. In essence, the combination of these elements represents vital resources concerning heritage products which are essential in driving the development of the local craft industry and are closely connected to the local cultural heritage. *Collective belief* is associated with *local memories*, *identity*, *celebration & ritual*, as well as *principle & philosophy*. For instance, *local memories* represent a collective memory shared among a group of people, and *local identity* - underlines a set of values that represent a group of people. These elements relate to

the relationships between a heritage product and its community; these relationships include social status, spiritual, cultural, or historical connections. Such connections are part of the intangible cultural heritage and also relate to the perspective of craft-as-culture as discussed by Mohlman (1999), in which craft products represent intimate relationships and social constructions between users, makers, their surroundings as well as the community.

The *collective practices* are related to activities shared within a group of people. These activities happen at different levels, for instance, family, community, organization or company levels. The analysis identified all four heritage products comprise community-oriented activities in the past as well as in the present. The practices at the organizational level refer to practices connected to the craft industry; *economic development*, *cottage industry*, and *social manufacturing*. These practices relate to economic development and can be associated with the perspective of craft-as-industry (Mohlman, 1999) where the production processes are conducted in various scales, notably village level, district level, and regional level. These elements are reflected in the supply chain network as well as the manufacturing system that includes flexible working hours, a mixture of living and working space, casual and informal ways of working as well as the presence of children in the workspace. The last insight is a result of a system where production activities happen within residential areas. This research suggests that this area can be further explored in order to understand the influence of the social manufacturing system on the development and well-being of children who grew up in it. In summary, the elements presented in *Collective* can be linked to values that contribute to the well-being of the local community economically, socially, culturally as well as spiritually.

The last parameter, *individual* is associated with personal physical, mental, emotional and spiritual well-being. The results indicate values that influence *emotional* and *physical well-being*. Heritage products offer practices that are closely connected to an individual's cultural heritage which bring a sense of comfort as these objects comprise familiar characteristics that are in accordance with local nuances and distinct regional needs (Luo & Dong, 2017). Apart from the product, the art of craft-making itself offers a certain meditative effect on the makers, for instance, through repetitive movements, tasks that require focus and concentration as well as interactions with natural materials.

7.4.4 Conclusion

The artificial things around us comprise “a set of assumptions and values about the way we live” (H. Rees, 1997, p. 130). This analysis has explored the values associated with four heritage products and linked them to the elements of sustainability. The results offer a glimpse into the various interactions inherent within these products that are connected to the natural environment, the artificial environment, and people, both

individually and collectively. The four heritage products examined in this analysis used to be part of the folkcrafts—products that are created by the people for their everyday needs (see 4.2.1). Over time, when these products became part of the craft industry, their roles and positions changed, and evolved together with the society.

By exploring values in each aspect, the research demonstrates the complex interactions inherent within a heritage product. As discussed in subsection 4.3.2, interactions are fundamental to the creation of values which are dynamic, changing and continuously in transition. These continuous changes relate to the notion of sustainability as a process of constant improvements of the current state of the world (see 4.6.1). This indicates that sustainability is not about a tangible product that is labeled as sustainable. Instead, sustainability is connected to the various interactions between a product with the natural environment as well as the people. This underlines the importance of seeking balanced interactions that offer the means for all aspects to exist in harmony. For instance, in procuring the raw material to make a craft product, we need to ensure the health and vitality of the natural resource, the well-being of the community as well as individuals involved.

One of the questions highlighted in subsection 4.6.1 is: would it be possible for the emerging countries to leapfrog and evolve differently from the Western world? Although precarious, and at times, unpopular, the traditional way of living does contribute to a sustainable way of living. However, in reality, not everything can be preserved for the future (see 4.6.1). Soini and Birkeland (2014) highlight that cultural and economic factors are often the main considerations. From this exploration, this research reiterates that sustainability is also an important aspect to be considered in the efforts of safeguarding the cultural heritage. Specifically, these efforts should expand beyond safeguarding heritage products and towards nurturing and promoting the values that contribute towards balanced and healthy interactions between nature, people, and the artificial. Enhancing, reinforcing, and strengthening elements of sustainability rooted in the past can be a practical approach to cultivate a bottom-up approach to sustainable development. Hence, these elements can also be used as a qualitative indicator to express the connection between cultural heritage and sustainability in the context of heritage products.

Furthermore, it is vital to select these values and adopt them in a relevant context. For instance, the efficient use of local and natural resources identified in Case Study 2 can be useful for local producers to reflect on the way their resources have been managed. Another example is the benefits of craft-making for the emotional well-being of the maker. These actions are by no means foreign or new, but by connecting these elements to the local context, these traditional practices become more than simply old ways of doing things: they can empower the local community to take charge of their development processes leading to a sustainable change and transformation. Through these efforts, the model of a satisfying life can be expanded from the culture of

consumption to the culture of creation and the culture of appreciation as well. The findings discussed in this analysis contributed to the fourth proposition of this research:

Proposition 4a

Heritage products comprise of interactions from the past which can be useful in modern day sustainable initiatives, this research proposes that the framework of sustainable elements associated with products can be used as indicators to identify and elicit these interactions.

Final Proposition 4

Heritage products comprise interactions from the past which can be useful in modern day's sustainability initiatives; the framework of sustainability can be used to elicit these interactions.

These interactions uncover a complex network of relationships between a heritage product with the natural environment, the artificial environment, and people, both, individually and collectively.

In short, the research stresses the importance of establishing an equilibrium in which the current generation of people interacts with their natural and artificial environment while taking into consideration the needs of the future generations. This means safeguarding the natural resources that provide our living sustenance, establishing an artificial environment that supports a flourishing way of living, and creating a peaceful society whilst nurturing individual well-being.

7.5 Conclusion

This chapter has presented four analyses that have been conducted based on the research propositions. Section 7.1 presents the first analysis which explores the use of the concept of boundary objects to enhance knowledge exchange and transformation between craft and design domains. Section 7.2 presents the process of understanding the composition of values of heritage products. In this analysis the research identified the underlying network of connections within the composition. Next, section 7.3 explores the adaptation of values of heritage products in new product ideas. The result of this analysis demonstrates three levels of adaptation of values of heritage products: product-level, collection-level, and company-level. Finally, section 7.4 discusses the process and outcomes of eliciting elements of sustainability based on values of heritage products. Figure 7.33 illustrates the conceptual model based on the findings of these analyses. This conceptual research model indicates the final propositions based on the analyses presented in in this chapter. In the following chapter, the research discussed in detail the final propositions (**FPs**) in connection to the research questions (**RQs**).

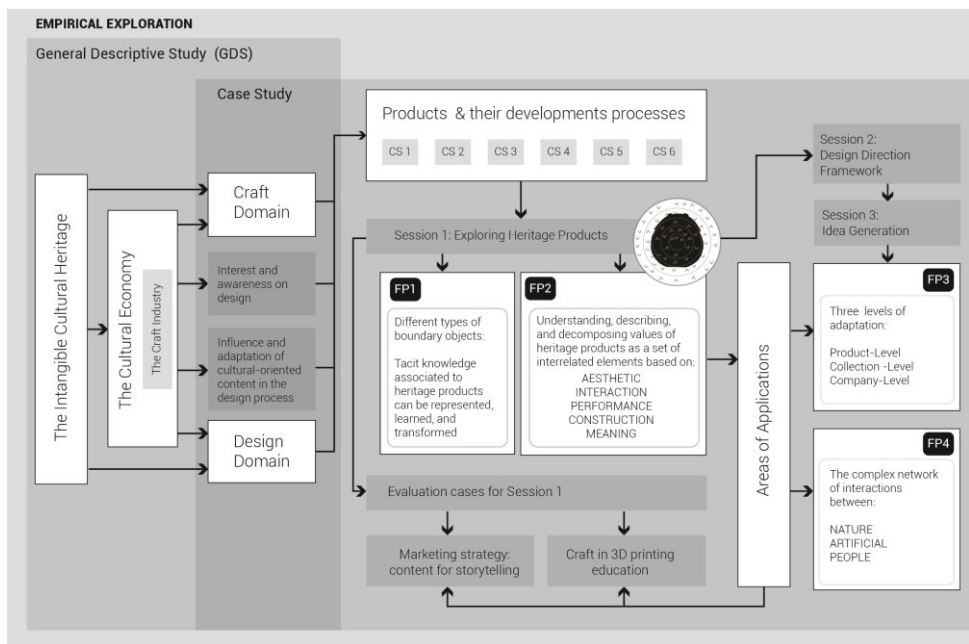


Figure 7.33: Conceptual Research Model based on results of the analyses.

Chapter 8

Conclusion and Recommendations

This chapter presents the conclusion by discussing the propositions in connection to the research questions, the implications to theory and practice, the limitation of the research and future works.

8 Conclusion and Recommendations

This research was initiated to address the gap between craft and design domains, and the opportunity for them to exchange and share their knowledge of products and their development process. To operationalize this opportunity, this research identified a catalyst that can bring both domains together: heritage products. Heritage products are products that have been made and re-made for generations, consist of tangible and intangible elements inherited from the previous generations and are embedded with values that are important to be safeguarded for future generations (see Definition Box in 1.1.2). However, values are intricately ingrained in heritage products: they are created, compiled, and evolved over time. These values are part of the tacit knowledge associated with craft products. When such knowledge is known to be inherited from the previous generations then it is considered as part of the intangible cultural heritage. These values also offer a tremendous resource as creative input from a design perspective. Considering their role as a creative resource and relevance as a catalyst in bringing craft and design domains together, this research has sought to identify values of heritage products and to explore their application as a resource from a design perspective, based on the following main research question:

Main Research Question (MRQ):

How can the values of heritage products be identified and applied as a creative resource for design and sustainability initiatives?

In Chapter 1, this **MRQ** has been expanded into two parts with two research questions in each part. Part 1 focused on identifying the values of heritage products. **RQ 1** explored the means to articulate values inherent within heritage products by making the tacit knowledge associated with these objects explicit. **RQ 2** aimed at understanding the composition of values inherent within heritage products. Next, in Part 2 two potential areas of application for values of heritage products were explored as a) a creative input in developing new product ideas in **RQ 3**, and as b) a resource to elicit elements of sustainability associated with heritage products in **RQ 4**.

Chapter 2 framed these research questions against the backdrop of the cultural economy, and the research identified its empirical domain: the craft industries of Vietnam and Malaysia. In that chapter, the research presented the initial propositions which provided the initial answers to the **RQs**. Throughout this thesis these propositions have been refined following the findings and insights from the literature exploration (Chapter 4), the empirical exploration (Chapter 6), and the analysis of the collected empirical data (Chapter 7). The process of refining the propositions eventually led towards answers to the **RQs**.

In this chapter, the main research findings are presented based on Part 1: Identifying Values of Heritage Products and Part 2: Applying Values of Heritage Products as a

Creative Resource. Then, the discussion continues with the contributions of the research to theory and practice, followed by an explanation of the limitations of the research. Finally, recommendations for future research are presented.

8.1 Answering the Research Questions

In this section, the research discusses the propositions in connection with the research questions. The discussion of each part starts with the research question, followed by the description of the final proposition (presented in Chapter 7) and the main findings of the exploration.

8.1.1 Part 1: Identifying Values of Heritage Products

The first research question, formulated to identify values of heritage products, and the final proposition are shown below.

Research Question 1 (RQ 1):

How can the exchange of knowledge between craftspeople and designers be adapted as a catalyst to articulate values of heritage products?

Final Proposition 1 (FP1)

The craft and the design domains' interest in products and their development processes offers an opportunity for both domains to exchange their knowledge about heritage products; through the use of different types of boundary objects, tacit knowledge associated with heritage products can be represented, learned, and transformed.

This research question focuses on the exchange of knowledge between craftspeople and designers which also serves as a catalyst to articulate values of heritage products. In Chapter 2, the research identified craft and design domains as part of the cultural economy with an interest and aspiration in products and their development process. However, their approaches are fundamentally distinct. The craft domain is known as the bearer of traditional knowledge while the design domain has established a field of scientific understanding on the process of solving complex problems. Regardless of their differences, the literature findings in Chapter 4 highlighted that both domains are interested and invested in heritage products, therefore exchanging their knowledge about such products is one way of bringing the two domains closer to each other. Empirical insights from the General Descriptive Study in Chapter 6 reiterated these findings and supported the implementation of the design workshops, highlighting that *the craft and the design domains' interest in products and their development offers an opportunity for both domains to exchange their knowledge about heritage products.*

In order to examine the exchange and articulate the tacit knowledge associated with heritage products into a codified form, the research uses the theory of *boundary objects*. Chapter 4 discussed this theory which is then used as a basis to analyze data

from two case studies (Case Study 3: The Sayong Water Pitcher and Case Study 4: The Lion Head, both in Chapter 6). In the analysis (Chapter 7: Analysis 1), the research has shown that craftspeople and designers can work together effectively with the support of different types of boundary objects. The research examined four objects in the design intervention sessions against the characteristics of four categories of boundary objects. The results indicated that heritage products resemble *platonian objects*, the MPV model has characteristics of *standardized forms*, the PV canvas acts as a *map of boundaries*, and the mapped PV canvas is a form of a *repository*. ***Through the use of these different types of boundary objects***, this research has shown how ***tacit knowledge associated with heritage products can be represented, learned and transformed*** into codified forms.

In short, the use of different types of boundary objects supports the exchange of knowledge between craftspeople and designers and serves as a catalyst to articulate tacit knowledge associated with a heritage product into explicit forms. The second research question (RQ 2) then examines the codified forms of knowledge as values of heritage product.

Research Question 2 (RQ 2):

What are the values inherent within a heritage product that are shared by craft and design domains?

Final Proposition 2

The composition of values attributed to a heritage product can be understood, described, and decomposed according to a set of interrelated elements that comprise aesthetic, interaction, performance, construction, and meaning layers. The compilation of values in each layer can be viewed as a hierarchical structure, identified as either inherited or contemporary and clustered as individual or collective.

The second research question focuses on understanding the values of heritage products shared by craft and design domains. In Chapter 2, the research underlined that values are attributed to products and that these values can be described as a set of interrelated elements that are shared over time and across generations. The literature exploration (Chapter 4) found that *interactions* are the fundamental aspect of value creations. Values in association with products are created based on the evaluation between what is expected (expected values) and what has been experienced (perceived values), and satisfaction is created when the perceived value meets the expected value. Satisfactory interactions that have been repeated and sustained over time are considered ‘accepted values.’ This research considered that the experiences shared by local people about their heritage products are ‘accepted values’. However, the composition of values in association with products is also abstract, elusive, and susceptible to change. By assuming that it is part of a hierarchical structure, ***the composition of values attributed to a heritage product can be understood, described,***

and decomposed according to a set of interrelated elements. To operationalize this proposition, this research adopted the five layers of product elements as a lens to explore values inherent within heritage products, and in Chapter 5, the Multilayer Product Value (MPV) model that *comprises aesthetic, interaction, performance, construction, and meaning layers* was introduced.

The combination of this model and its extension, the Product Value (PV) canvas, were used as design tools to support the session ‘*Exploring Heritage Products*’ during the empirical exploration (Chapter 6). During each session, participants were asked to share, elicit, and map their knowledge and experiences of a selected heritage product. Seven heritage products were explored in total and the statements that have been mapped onto the PV canvases were used as the primary data and analyzed in Chapter 7. In this analysis, the statements have been examined to understand the underlying structure of the composition of values of heritage products. The results showcase the complexity and multidimensional nature of values associated with heritage products, and show that the compilation of *each layer can be viewed as a hierarchical structure, identified as either inherited or contemporary, and clustered as either individual or collective.*

In brief, heritage products consist of a composition of ‘accepted values’ which can be understood, described, and decomposed based on a set of interrelated elements. By extracting these values according to the five layers of the MPV model, the research has presented a method to reduce the abstraction and elusiveness of the composition of values attributed to heritage products.

8.1.2 Part 2: Values of Heritage Products as a Creative Resource

Chapter 2 highlighted that transforming the tacit knowledge associated with heritage products into explicit forms increases the possibility of such knowledge to be used as a resource. The third and fourth research questions were formulated based on two identified areas of applications in design and sustainability initiatives for values of heritage products that have been articulated in Part 1. In the third research question, the research explored the use of these values as a creative resource in the product development process.

Research Question 3 (RQ 3):

How can values of heritage products be used as a creative resource in the product development process?

Final Proposition 3

Values of heritage products can be used as a creative resource via a structured approach that includes the participation of local craft stakeholders and the deliberate inclusion of heritage products as an input in the fuzzy front end of the product development process. The approach offers three levels of adaptation in

which values of heritage products can be adapted in the process: product-level, collection-level, and company-level.

This research question focuses on the deliberate and conscious adaptation of heritage products in the product development process. In Chapter 4, the research explored examples of products embedded with elements of cultural heritage and approaches by design professionals and researchers in adapting culture-oriented content in the design process. The discussion highlighted the importance of inclusive and conscious adaptation of such content in new design ideas. The literature findings guided the development *of a structured approach that includes the participation of local craft stakeholders and the deliberate inclusion of heritage products as an input in the fuzzy front end of the product development process*. Introduced in Chapter 5, the approach comprises three design intervention sessions: 1) *Exploring Heritage Products*, 2) *Design Direction Framework*, and 3) *Concept Generation*, which have been implemented as part of a design workshop. Based on the results from three case studies, the research analyzed the adaptation of values of heritage products in the concepts generated by the end of the workshop.

In Chapter 7, the analysis discerned the link between the culture-oriented content and new product ideas by mapping the connections between heritage products, statements from the PV canvas that were selected for the Design Direction Framework, and sketches of concepts generated in the idea generation session. The analysis identified that *the approach offers three levels of adaptations in which values of heritage products can be adapted in the product development process: product-level, collection-level, and company-level*. Understanding the different ways of integrating the values of heritage products can provide a platform to support local stakeholders to make efficient use of the local cultural resources as a creative input in the product development process.

In brief, the thesis has presented an approach in which values of heritage products can be used as a creative resource in the product development process by deliberately including them in the early stage of the process. Applying this approach enabled the research to trace and discern the different adaptations of culture-oriented content, i.e. values of heritage products in the product development process. In the fourth research question (**RQ 4**) the research explored the use of values of heritage products to elicit elements of sustainability inherent within heritage products.

Research Question 4 (RQ 4):

What are the values embedded in the heritage products that correspond with the elements of sustainability of a product?

Final Proposition 4

Heritage products comprise interactions from the past which can be useful in modern day's sustainability initiatives; the framework of sustainability can be used

to elicit these interactions. These interactions uncover a complex network of relationships between a heritage product with the natural environment, the artificial environment, and people, both individually and collectively.

This research question focuses on the use of values of heritage products as a resource to elicit interactions and practices that promote a sustainable way of living. In Chapter 4, the research discussed the present context of sustainability and identified the importance of understanding ‘what we value’ because this influences the way we consume. Accepted values are part of the construction of our culture; hence, it is pertinent to understand and be aware of the interactions we choose to repeat and sustain over time. Through this exploration, the research aimed to identify and elicit values that are already part of our culture—those that instill and promote our well-being, economic prosperity, ecological sustenance, and a flourishing society. The research argued that if values rooted in our cultural heritage can offer such benefits, we should strive to restore and reclaim them in our day-to-day life.

This research proposed that values of heritage *products comprise interactions from the past which can be useful in modern day sustainable initiatives* in Chapter 4. Based on the result from Case Study 2, the research identified a selection of values inherent within heritage products that are linked to modern day’s perspective of sustainable design. To examine this insight further, the research generated the Framework of Sustainable Elements (FoSE) as an indicator to elicit elements of sustainability inherent within heritage products in a structured manner. The framework was structured based on the three main aspects of sustainability: the natural environment, the artificial environment, and people (individual and collective). It was used to identify elements of sustainability in the statements mapped from four heritage products in Chapter 7. The analysis showed that *the framework can be used to elicit values of heritage products and uncover a complex network of relationships of a heritage product with the natural environment, the artificial environment, and people, both individually and collectively*. These interactions are dynamic, changing, and continuously in transition and can be understood by exploring the composition of values in association with a heritage product.

In brief, sustainability is not simply about a tangible product that is labeled as sustainable; instead, sustainability is connected to the various values inherent within a product that promote sustainable interactions in the present. By examining these interactions based on their connections to nature, people, and the artificial environment, values embedded in heritage products that promote a sustainable way of living can be elicited and identified.

8.2 The Values of Heritage Products

This research was initiated to address the gap and opportunity between craft and design domains in exchanging knowledge about products and their development process. However, one of the main contributions of this thesis is the explicit exploration of the concept of values in association with heritage products from theoretical as well as empirical perspectives. Tunstall (2013, p. 239) mentioned Frederik Barth's critical view on using "*the term 'values' without creating an explicit theory and analysis of values*" among anthropologists. Creating an explicit theory and analysis of values is challenging due to the abstraction and multifaceted nature of the subject with a plethora of theories from various research communities. Nevertheless, such interest also underlines its significance in the general society as well as among academics.

The exploration of values in this research demonstrated a hybridization of knowledge where knowledge from different fields of expertise were cross-fertilized to nurturing inter-language between them (Loulanski & Loulanski, 2016). However, to manage the complexity and abstractness of the subject the research anchored its exploration on the values associated with heritage products. This focus enabled the explicit description of values that are associated with products. These theoretical findings were then examined against the empirical data collected using the same tools and procedures in different background settings. Here, the research presents four main findings in connection to values of heritage products: a) Accepted Values in Heritage Products, b) Inherited Values as part of the Intangible Cultural Heritage, c) The Complexity behind the Composition of Values, and d) The Importance of Identifying Areas of Applications.

Accepted Values in Heritage Products

Based on the literature exploration, this research introduced the concept of 'accepted values' which is defined as "satisfactory interactions that lead to repetition." This concept was derived from the SERVQUAL formula (Parasuraman et al., 1985) demonstrating that consumers' acceptance is based on their evaluation of their actual experiences against their expectations. Such acceptance leads to repetitions. These repeated actions in turn produced a particular pattern of experiences that permeates into our daily life and eventually become part of the network of our culture. Over time—either consciously or unconsciously—such values are endorsed and shared with others and can be passed on to the following generation as well.

This understanding enabled the research to observe the connection between the concept of 'accepted value' to 'value-as-actions' and 'value-as-consensus'. Value-as-action is derived from the creation of values from individual experiences, i.e. users and consumers (Babin et al., 1994; Boztepe, 2007; Sanchez-Fernandez & Iniesta-Bonillo, 2007; Tasci, 2016; Zeithaml, 1988). Value-as-consensus is connected to experiences that are shared and collectively accepted within a group of people, i.e. communities,

tribes, organizations, and countries (Boztepe, 2007; Friedman, 1996; Graeber, 2001). This indicates that values can be experienced individually or shared collectively.

This research did not include the business aspect as part of its scope (see Table 2.1), and so a third cluster of values, value-as-capital, was not included in the exploration. However, expanding this research to view the exchange of values from an economic perspective presents an intriguing connection to the growing body of research works on value propositions in services and products; exploring this cluster would involve the understanding how a compilation of values can be offered as part of an exchange with another party using monetary value or other comparable elements. Such a compilation may include value offerings that need to be experienced individually or those known and accepted collectively, or a mixture of both. Figure 8.1 illustrates the exploration of accepted values as values-as-action and values-as-consensus. Next to this, the research also proposed that values that are passed on to the next generation are part of the intangible cultural heritage.

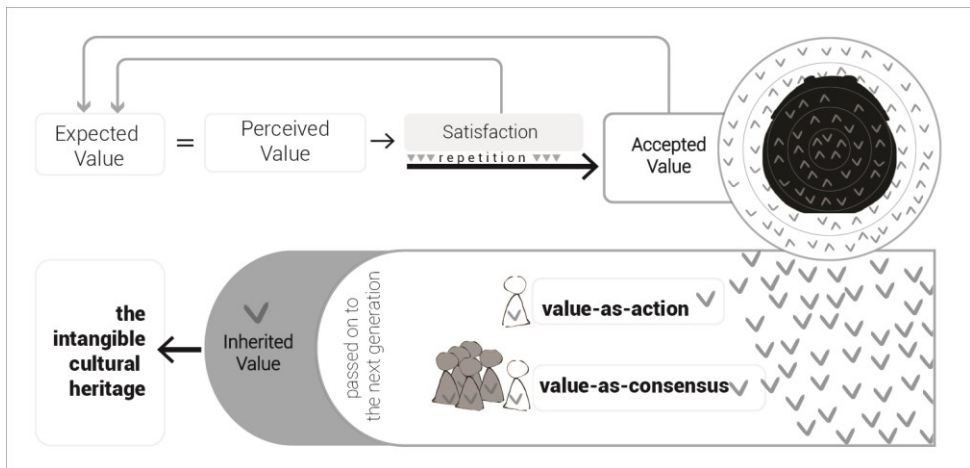


Figure 8.1: The Concept of Accepted Value and its connections explored in this thesis.

Inherited Values as part of the Intangible Cultural Heritage

All heritage products explored in this research are considered as part of the intangible cultural heritage as these products have been recreated by the communities based on the traditional knowledge that have been transmitted from one generation to another, providing a sense of identity to the communities and contributing to their economic development. The intangible cultural heritage is defined as *“the practices, representations, expressions, knowledge, skills – as well as instruments, objects, artifacts and cultural spaces”* that have been *“transmitted from generation to generation,”* are *“constantly recreated by communities and groups in response to their environment, their interaction with nature and their history,”* and provide *“a sense of*

identity and continuity” (UNESCO, 2003). Similar to the concept of values, the intangible cultural heritage is tacit, abstract, and ephemeral in nature. Hence, it is exposed to the risk of being marginalized and forgotten—unintended and undetected. This indicates the need to transform part of this heritage into explicit forms (Galla, 2008; Prosalendis et al., 2004).

Through its exploration, this research has presented a means to explore values associated to objects that are part of the intangible cultural heritage. The result of examining the statements mapped using the five layers of the MPV model highlight that the composition of values associated with the heritage products does not only comprise those that were inherited but also values that were adopted from the contemporary society. Figure 8.1 shows how the use of the method explored and presented in this research can contribute to the expansion of such efforts. In essence, by articulating these values in a structured manner the research managed to identify values that are inherited by the craft representatives. The result of the second analysis suggests that these values are not limited to the skills and techniques used to make a product (from the Construction layer). Instead, inherited values were identified in various aspects of the products, users, makers, local practices as well as their collective beliefs. Exploring this insight further can provide a better understanding of the local communities and their identities, recognizes cultural diversity—locally and globally—and also supports the efforts in building cultural capital (Prosalendis et al., 2004, p. 1).

Another aspect that can benefit from further exploration is the values that are adopted from a new group or community. From the example of heritage products in subsection 5.2.1, the use of a stone mortar (*batu lesung*) and a cheese slicer (*kaasschaaf*) by the researcher demonstrates a simple representation of a compilation of values that she inherited from her elders and those adopted from living in a new community. This research did not explicitly explore the concept of ‘adopted values’ in detail; however, further understanding in this area can contribute towards an understanding of the current globalization phenomenon in which the various cultures of our world interact, adapt, and at times, repel one another. Next to this, understanding ‘adopted values’ may provide a new insight on ‘invented traditions’ in which nations or societies assumed ‘archaic and authentic rituals’ as an instrument to enhance their identities and unite communities (Boyer, 2018, p. 35).

The Complexity of the Composition of Values

Values in association with products are often perceived as abstract and elusive. This is rightly so because these values are continuously changing and evolving and the composition mapped onto the PV canvas represents only a moment of this transient process. To understand this composition, this research adopted the perspective of Herbert A. Simon (1996) on complexity and its connection to hierarchical structure. The research perceived that complexity is a system that is made of a large number of elements and these elements can be observed as a hierarchical structure. Based on this

theoretical understanding, the research described the values attributed to heritage products as a set of interrelated elements allowing the decomposition of these values into a network of categories structured in a hierarchical order. This observation offers the means to recognize values that are attributed, retained, discarded, or passed on to the next generations.

This perspective enabled the research to observe and show the different types of values associated with products, demonstrating the multidimensional nature of values as mentioned by Williams and Soutar (2009) empirically. However, apart from the two types of values proposed in their paper, namely, utilitarian and socio-psychological aspects (part of hedonic values), the empirical findings also identified six additional types of values associated with product explored in this research: visceral values, credence values, symbolic values, community values, family values, and moral and ethical values. This shows the dynamic and complexity of values associated to a product and explains why it is difficult to grasp the different dimensions of values that are attributed to a product over time and across generations. This research recognized the importance of the context in exploring and understanding the concept of values and recommends future research to establish a clear and specific area of exploration in order to capture this dynamic, transient, and ever changing research subject.

Scholz-Wäckerle states that “the aim of a science of complexity is to decompose complex interactions into meaningful modules (2014, p. 220).” This research has shown a means to reduce the intricacy of values in association with heritage products by viewing the composition of these values as a complex system that can be decomposed using a hierarchal structure:

“complexity, correctly viewed, is only a mask for simplicity; to find pattern hidden in apparent chaos” (Simon, 1996, p.1)

However, it is important to emphasize that this research took a view that the composition of values associated with heritage products is comprised of a large number of elements and hence is considered as a complex system. Based on this direction, the research mapped and structured these elements as a hierarchical structure. However, another aspect that was not covered is the *complicatedness* of the system which entails understanding the behavior of each individual elements and their relationships between each other (Tang & Salminen, 2001). Understanding the complicatedness of the system can further expand the understanding of the composition of values associated with heritage products.

The Importance of Potential Areas of Applications

This research has presented four different areas of applications for values of heritage products, namely, as a creative resource for the product development process, as content for marketing strategy, as part of educational efforts, and as a potential

resource for sustainability initiatives (see 7.5). Tunstall (2013, p. 240) shares a notion by Barth (1993) that exploring the concept of values “in and of themselves is not a productive strategy”. The sheer complexity of the subject can be “forbiddingly demanding and elaborate” and thus its exploration needs to be somewhat restricted, oriented towards certain actions, and influence relevant stakeholders (Barth, 1993). This research agrees with these notions and stresses the importance of identifying the areas in which the exploration of values can be meaningful. In retrospect, this research was initiated based on a potential area of application in which the researcher aims to explore and understand the adaptation of culture-oriented values in the design process. Although this objective became auxiliary in the course of this research, it had influenced its foundation by providing specific context and actions as well as involving specific stakeholders.

In summary, these findings present a set of considerations that can be used in the exploration of the concept of values, specifically associated with heritage products. However, it is pertinent to point out that these findings are still at an infancy stage due to the exploratory nature of the research and that the empirical data is limited to a small number of heritage products explored in two countries. Therefore, exploring more heritage products and expanding the research into various regions of the world can yield compelling outcomes with substantial analysis and evaluation benefits.

8.2.1 Other Theoretical Implications

The Concept of Heritage Products

One of the challenges in the early stage of this research was to determine if a traditional craft product is part of the tangible or the intangible cultural heritage. In the Framework of Cultural Statistics by UNESCO, craft products with *traditional* features are included in *Domain C: Visual Arts and Crafts*, while craft products with *contemporary* elements are linked to *Domain F: Design and Creative Services* (Pessoa et al., 2009). However, during the empirical exploration, the research observed the influence of cultural heritage in both traditional and contemporary craft products (see 6.1.3). The lines between traditional and contemporary craft products are fuzzy and indistinct. Craft products with traditional features can be made using modern technology while those with contemporary features might be still relying on traditional productions techniques. In addition to this, various terms found within the design domains were used to discuss what defines a heritage product in this research, for example, ‘material artifacts’ (Moalosi et al., 2007), ‘cultural objects’ (Lin, 2007) and ‘ancient cultural artifacts’ (Luo & Dong, 2017).

Based on the definitions of the tangible and intangible cultural heritage (see 4.3.1), the research established the concept of heritage products and gave an example to differentiate between products that are part of the tangible or the intangible cultural heritage (see 1.1.2). This research defined that a physical product that has been passed

on for generations is part of the tangible cultural heritage and a product that has been made and re-made based on the knowledge, values, and meanings inherited from the previous generations is part of the intangible cultural heritage. This establishment was significant in the development of this research as it offers the means to distinguish different types of products within the craft domains and provides an understanding why such a product can serve as an object of inquiry and a catalyst for discourse that brings the craft and the design domains together.

A Model of Sustainability for the Past, Present, and Future

In June 2018, John Elkington recalled the ‘Triple Bottom Line’ after 25 years of coining the term. He stated that sustainability should not be measured by loss and profit but instead it should focus on the well-being of people and the health of the planet (Elkington, 2018). This echoes Ehrenfeld’s notion of sustainability as “the possibility that humans and other life will flourish on the earth forever (2008, p. 49).”

To realize this idea, this research underlines the importance of a model of sustainability that is applicable to the past, the present, and the future. In this research, the different aspects related to sustainability have been categorized as tangible and intangible following the concept adopted from heritage studies (see 4.6.2). Based on this adaptation, this research identified three tangible aspects of sustainability: the *natural environment*, the *artificial environment*, and *people*. Using these three tangible aspects, the research examined the values of heritage products. The result of the analysis indicated that the complex interactions between heritage products can be represented by cultural interactions (as part of the local cultural heritage) and economic interactions (as part of the local craft industry). Furthermore, as these heritage products were once a folkcraft, they were initially created for daily use by the local people representing utilitarian interactions. Figure 8.2 illustrates the model created based on the exploration of values of heritage products suggesting that the three tangible aspects of this world are linked through numerous interactions between nature, the artificial, and people.

The research stresses the importance of balanced interactions that allow these three aspects to exist in harmony. From this perspective, sustainability is a continuous effort of creating flourishing interactions between people, nature, and the artificial. This means safeguarding the natural resources that provide our living sustenance, establishing an artificial environment that supports a flourishing way of living, and creating a peaceful society whilst nurturing individual well-being.

The theoretical exploration based on the ‘*four moments*’ by Marx and Engels (see 4.3.2), *the science of the artificial* by Simon (1996, p. 2) (see 7.4.3) and *the constructed capital* by McElroy and Van Engelen (2012, p. 34) (see 4.6.1) highlight the prominence of the elements of the world with evidence of human artifice or the artificial environment. This tangible aspect represents elements of the world that are

constructed by people which include heritage products. Forty-eight years ago, Simon stated that *the world we live in today is much more man-made, or artificial world than it is a natural world (1969, p.2).*” This statement remains true to this day. Furthermore, with the current technological development, the capabilities of the artificial aspect of our world are expanding, for instance with the Internet of Things, Big Data, and Artificial Intelligence. It is essential to recognize that the artificial environment is changing: it is evolving, capable of learning, discerning and highly competent in creating and supporting the production of interactions. This progress and advancement signifies the importance of including the artificial environment in the model of sustainability.

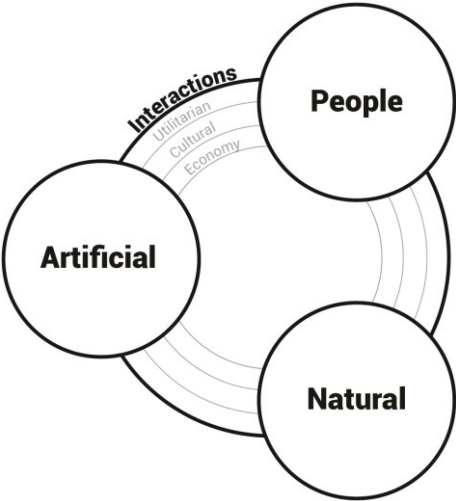


Figure 8.2: The three tangible aspects of sustainability and their interactions.

8.2.2 Implications for Practice

To elaborate the potential implications for practice, this subsection presents the practical applications for the session *‘Exploring Heritage Products’* and benefits of understanding the values of heritage products from the perspective of craft, design, and consumers.

“Exploring Heritage Products” Session

This approach was developed taking into consideration participants with little to no experience in design. It is in line with the objective of development pathways proposed by UNESCO that aim to promote the use of local culture heritage as a creative resource (UNESCO, 2013, p. 3). Using simple and easy to understand tools and procedures, the session focuses on the participants’ knowledge and experiences of a selected heritage product. Although initially designed to trigger discussion and the exchange of knowledge specifically between the craft and design domains, the results from the empirical exploration—especially the evaluation cases—suggest the potential that this session can be adopted in different contexts. The contexts may involve participants from various backgrounds, such as students, elderly, the product’s users, representatives from local ethnic communities as well as experts, for instance, anthropologists and historians.

Values of Heritage Products for Designers

This research has shown two areas of applications for values of heritage products in the context of design and sustainability initiatives: a) as a creative input to generate new design ideas, and b) as a resource to identify elements of sustainability. Next to this, understanding values of heritage products in general support the process of probing for elements of cultural heritage as a resource to drive future developments. In this process both preservation and innovation need to co-exist and designers can be either supporting agents in safeguarding the local cultural heritage or agents that disrupt these collective values. This highlights the importance of nurturing awareness among designers in adapting values associated with local cultural heritage in their product ideas—consciously and responsibly.

Values of Heritage Products for Craftspeople

Values of heritage products are part of craftspeople’s tacit knowledge. Making part of this knowledge explicit, their knowledge about heritage products is no longer just their personal narrative: it is being disrupted and reinforced based on contemporary design theories. This thematic structure is useful for craftspeople to share their knowledge among each other as well as with outsiders in a simple and systematic manner, and it can be useful as marketing content in which a specific set of values are selected and transformed into snippets and short stories about a craftspeople’s practice.

The Importance of Understanding Values of Heritage Products

In Chapter 6, the research discussed the dynamic and complexity of the influence of the cultural heritage on traditional and contemporary craft products. Traditional knowledge can be embedded in the process of making contemporary craft products and likewise, contemporary knowledge, at times, is adopted in the process of making traditional craft products. These assimilations between the old and the new require a careful consideration of the notion of authenticity as well as the commercialization of craft products. A craft product's traditional outwards appearance does not necessarily mean authenticity and a craft product's contemporary outwards appearance does not have to mean that they have been commercialized entirely using modern manufacturing systems. This situation highlights the need for a shift in the perception of heritage preservation which focuses on interactions *with* the past instead of preservation *of* the past. Exploring and identifying the composition of values associated with products is one of the means to identify the elements of the past that are integrated in today's craft products.

8.3 Research Limitations and Future Studies

This section presents the limitations of the research as well as the recommendations for the future studies.

8.3.1 The limitations of the research

There are a number of issues that may limit the relevance of the findings presented in this research. This subsection discusses these limitations from the three different perspectives: the discursive nature of an exploratory research, the structure of the research approach, and the data used for the analysis.

The Discursive Nature of an Exploratory Research

As most design research, this research is also exploratory in nature which means it probes into a new emerging research area, offers new insights and enables a detailed description about a context of a given phenomenon. It is flexible and useful in laying the foundation for future studies. However, as most exploratory research, the outcomes presented in this research are preliminary and need to be further explored for conclusive, quantitative support. The exploratory process in this research did not happen in a linear manner: there were a lot of iterations in identifying the focus of the research, understanding the context of the field, and exploring the theories that explained or supported insights and findings. This thesis, however, has to a certain extent structured and formalized this process, namely, the literature exploration, the qualitative data collected from the field together with the researcher's experiences, actions, and observations in a deliberate step-by-step manner in order to communicate the research and its results to the readers. This approach (although common in the design sphere and other exploratory research) has its drawbacks as the thesis only

presents one of the many narratives possible for the experience. This limitation can be mitigated via quantitative expansion on the research findings.

The Structure of the Research Approach

The Structure of the Research Approach that is presented in section 3.2 explained an extensive empirical exploration, one that has taken into consideration the requirements of the research as well as the motivations to support the local craft stakeholders in their challenges, especially in the context of the product development process. Although this structure provided the means for the research to initiate, implement, and collect relevant data during the empirical exploration, it also required a significant amount of time and resources of the researcher in managing and balancing both research and practical actions. This factor limits the researcher's efforts, for instance, to explore different research methods and to look at the context of the research from a different perspective. Furthermore, data may have been collected in the context of the case study which is not directly connected to the research. A more focused and simpler research approach could be beneficial; however, as this research is exploratory in nature, such information often arrived in a form of a reflection rather than an intention.

The Use of a Single Method to Collect Data

The empirical data used in the analyses of this study is based on a single method of data collection, namely the design intervention session. Using specific tools and procedures, the research was able to collect similar data across different case studies with various background settings. Furthermore, the research uses the session artifacts as the primary data. The reason behind this decision is that session artifacts represent an output created *in-situ* and generated together with the participants. These factors supported the research to establish the *dependability* for the data as it ensures similar ways of collecting data over time and reduces data alteration during the analysis phase. However, this decision has also somewhat limited the exploration as the analyses are confined within the same sphere of data. Using different methods, for example, questionnaires or asking individuals to map the PV canvas themselves may provide different perspectives thus enriching the outcomes of the research. The method structured, implemented, and presented in this research was sufficient to answer the research questions; however, the inclusion of other data collection methods could potentially open new lines of inquiry and insights in the analysis.

8.3.2 Future Studies

This research exploration has also opened other avenues for future studies. This section presents aspects and directions proposed for future considerations.

Exploring a Heritage Product in Various Locations

During the empirical exploration, the research identified several similarities among the heritage products, specifically, folk products within Malaysia and Vietnam, such as bamboo mats as part of a house interior or clay roof tiles on traditional houses. Using the method established for the session '*Exploring Heritage Products*', similar heritage products that exist in various locations can be explored. Results from such research can potentially illustrate the diaspora of heritage products, allowing a better understanding of values that are unique to a community and those that transcend the boundaries, regionally as well as globally.

Examining Design Tools as Boundary Objects

In Analysis 1, the research highlighted the potential to examine other existing design tools as boundary objects. Although the analysis focused specifically on the tools developed in this research, there are similarities between the characteristics of design tools in general and boundary objects. In theory, boundary objects are scaffolding that supports knowledge exchange and collaboration efforts. Hence, using this theory to examine design tools can provide new insights and understandings on the theory behind the effectiveness of design tools in creative as well as collaborative settings.

Culture-oriented Content as A Source of Reference

Designers need to leapfrog from the practice of taking all the elements and information around us as a source of inspiration towards providing a source reference when it is due, especially when it involves integrating elements from a local cultural heritage. Such a practice can promote positive integration between designers who are responsible in shaping the future and the bearers of traditional knowledge who are responsible in safeguarding knowledge from the past. Such integration can weave knowledge from the past in shaping our present whilst making efforts to appreciate and recognize knowledge that has been passed on for generations. This also generates an opportunity for designers to play a role in enhancing, restoring, and reinforcing traditional elements in the modern society acting as agents that can support safeguarding heritage for future generations.

Design Research and Cultural Heritage

Research related to culture is common within the design domain; however, investigations that focus on the cultural heritage are still rare. This research perceived heritage as a subset of culture offering certain opportunities to explore its roles and influences in the design domain. Furthermore, one of the significant aspects of cultural heritage is their understanding on collective intergenerational interactions that represent complex relationships between people, their artificial goods, and natural

surroundings. By taking the intergenerational perspective into considerations, factors such as heritage as well as sustainability will influence the design activities as well as decisions. Altogether, design research that focuses on the cultural heritage will also add to the understanding of the dynamics of sustaining knowledge from the past with the aspiration to integrate them in our future living.

The Intangibles

The intangibles are interactions that contribute to the creation of values. As we continue to design for interactions we are also influencing what will be valued by future generations. Regardless of our intentions, the outcomes will be the future they inherit—their cultural heritage.

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10 Appendixes

Appendix 1: Culture-Oriented Design Approaches (Chapter 4)

In reference to Chapter 4 (subsection 4.5.1, Figure 4.12).

The first approach has been extracted from the catalog distributed in *Biennale Interieur*, Kortrijk, Belgium by &tradition in which the company highlighted specific aspects of their collaboration efforts with designers as well as design studios (&tradition, 2014). Their collaborative efforts aim to adopt values of Nordic tradition and heritage in contemporary design. Furthermore, these efforts also take into consideration traditional aspects, market trends, innovative solutions and sustainable elements.

The second approach developed by Lin (2007) is known as ‘Cultural Product Design’. As seen in Figure 4.12, there are three main steps in this approach: Cultural Inspiration, Cultural Product Design, and Culturally-Oriented Product. The first step, Cultural Inspiration, focuses on identifying and extracting cultural features associated with a selected cultural object¹⁰. The second step, Cultural Product Design, includes the process of translating information extracted from the cultural objects into design elements (or design criteria). Finally, the third step, Culturally-Oriented Product, refers to the implementation process in which the selected cultural features are adapted into contemporary products. This approach has also been adopted by Luo & Dong (2017) in their study on the use of ancient cultural artifacts as cultural inspirations.

The third approach developed by Tung (2012) focuses on craft-design collaborations. According to her study, collaboration efforts between craft and design domains can potentially highlight interesting elements from traditional knowledge such as local wisdom and traditional practices that can spark new ideas and solutions (Tung, 2012). Tung (2012) proposes a practice-led approach in which traditional knowledge is used as one of the creative resources in craft-design collaboration efforts. The approach aims to explore the possibility in design whilst understanding the capability of craft in generating products that meet the demands of the contemporary market. In this

¹⁰ This step uses the framework of exploring cultural objects by Lin (2007) discussed in subsection 4.3.4.

approach, culture-oriented inspirations are derived from the exchange of knowledge and the experiences shared during the collaboration efforts.

The fourth approach also includes a type craft-design collaboration efforts, however, instead of exchanging knowledge for design inspirations; the craft and design collaboration efforts focus on building a cultural repository. The 'Rhizome Approach' by Reubens (2010, 2016) is an approach that starts with craft and design collaboration to build a database about traditional craft products. In this approach, craftspeople are responsible for preparing 'a complete range of traditional products; using their own tools in actual scale' while designers are involved in documenting the process. This database represents a form of 'cultural repository'; a part of the local cultural capital. This database is then used as a creative resource in the design process (Reubens, 2010). This means that the process of building the database is not necessarily part of the design process; however, its outcomes can be useful as a creative input in the design process. This approach also identifies three target markets for the development of craft products:

- *Expressive* – realigning art and craft for unique pieces for a niche market. Through this direction, studio-craft products can be developed, and these products are examples of 'craft-as-art' (refer to Figure 4.1).
- *Prosumer* – focusing on local market and designed for daily consumptions. This direction leads to the development of products for local consumptions, and these products can be part of both 'craft-as-industry' and 'craft-as-culture' (refer to Figure 4.1).
- *Glocal* – influence by sustainability for local and global markets. This direction triggers the development of sustainable products, and these products are part of 'craft-as-industry' (refer to Figure 4.1).

Appendix 2: Sustainable Design Approaches (Chapter 4)

- *D4S Strategy Wheel*—This assessment strategy is part of the method used to understand the sustainability impact of a specific product based on different stages of the product life-cycle. This qualitative assessment method comprises of four parameters: New Concept Development, Product Components Level, Product Structure Level, and Product System Level. These categories were adapted from the eco-design approach by Brezet and van Hemel (1997) which consist of seven aspects of product improvements as shown in Table 4.4 (Crul & Diehl, 2008; Jansen & Crul, 2012).
- *Sustainable Design Elements*—This list of sustainable design elements was presented by Mr. Nguyen Hong Long, Project Coordinator for SPIN

(Sustainable Product Innovation) Project—a four-year project (2010–2014) funded by the SWITCH Asia Programme–European Union (EU). The ‘*Sustainable Design Workshop*’ organized by the Ministry of Foreign Affairs, the Netherlands in Hanoi, Vietnam. The presentation was part of the approach developed to support local producers in adopting sustainable design and productions processes. The list comprises of six parameters: Material Selections, Production, Distribution, End-of-Life, Social, and Cultural. Details on the design elements included in each parameter are included in Table 4.5 (Long, 2013).

- *Future Living Studio 3* –This checklist is part of the sustainable elements adopted in the third cycle of the ‘Future Living Studio.’ The studio serves as a platform for insiders and outsiders (in this context between local and international designers) to collaborate and exchange their knowledge with the aim to explore elements of sustainable design and production along with the participation of local companies (Jin, 2015, p. 147). The checklist consists of six parameters: Material Selections, Production, Distribution, Usage, End-of-Life, and Design. Details related to the design elements adopted in these parameters are included in Table 4.5.
- *Holistic Sustainable Checklist* –This checklist is part of the approach developed by Reubens (2016) for enterprises in developing countries, with a specific focus on the craft industry. The checklist was drawn up based on a number of existing frameworks namely, the “D4S Rules of Thumbs” by UNEP and Delft University of Technology, the Business for Social Compliance (BSCI) Code of Conduct of the Foreign Trade Association (FTA) and the conventions of the International Labor Organization (ILO) (2016, p. 261)”. In principle, the checklist consists of five parameters: Material Considerations, Product Considerations, Distribution Considerations, Consumer Use Considerations and End-of-Life Handling Considerations. This integrative framework focuses on different elements of sustainability across the general phases of the production-to-consumption system. The elements included in this checklist are listed in Table 4.6.

Appendix 3: The General Descriptive Study Activities (Chapter 5)

Visited Trade Fairs & Events

Lifestyle Vietnam 2012	Ho Chi Minh City, Vietnam.
Lifestyle Vietnam 2013	Ho Chi Minh City, Vietnam.
Lifestyle Vietnam 2014	Ho Chi Minh City, Vietnam.
Hari Kraftangan Kebangsaan, 2013	Kuala Lumpur, Malaysia.
Ambiente 2013	Frankfurt, Germany.

	Pottery-based (MY)	Craftsperson; Entrepreneur (3),	Sayong, Perak.
	Pottery-based (MY)	Craftsperson; Entrepreneur; Educator (2),	Sayong, Perak.
	Pottery-based (MY)	Craftsperson; Entrepreneur; Educator.	Bachok, Kelantan.
	Pottery-based (MY)	Craftsperson.	Bachok, Kelantan.
Designers	Product Design (VN)	Designer (4).	Hanoi.
	Product Design (MY)	Designer (2). Designer; Researcher (2). Designer; Researcher; Educator (2).	Sayong, Perak. Kuala Lumpur. Kuala Lumpur.
Local Organizations	SPIN (VN)	Sustainability Expert; Coordinator.	Hanoi
	Vietcraft (VN)	Vice President	Hanoi
	Kraftangan (MY)	Director. Head of Design.	Kuala Lumpur
	UNESCO (VN)	Culture Program Coordinator	Hanoi
	UMA (VN)	Founder	Hanoi
	Akademi Nik Rashiddin (VN)	Researcher; Educator. Staff (2)	Bachok Kelantan

Appendix 4: Design Oriented Activities in Vietnam (Chapter 6)

- Sustainable Product Innovation (SPIN) is a four year project (2010–2014) funded by the SWITCH Asia Programme—European Union (EU) with the aim to develop and promote sustainable product innovation whilst increasing social and environment quality of products produced in Vietnam, Laos and Cambodia (Jansen & Crul, 2012) (SPIN,2014).
- Crafting out of Poverty is “a joint program on green production and trade to increase income and employment for the rural poor”. This six months project focuses designing for sustainable craft in Vietnam with the aim to create new opportunities and improve the income of local producers through collaboration with a Scandinavian design team, a local craft organization together with 15 craft companies. The outcome of this project was exhibited in ‘Lifestyle 2011’, Ho Chi Minh City (Brandth et. Al, 2012).
- Vietnam Sustainable Design started in 2013 with the endorsement from the Center for the Promotion of Imports from Developing countries (CBI) and commissioned by the Ministry of Foreign Affairs, the Netherlands. This project also aims to support local producers to adopt sustainable practices in their product design while developing products for the European market. Over fifty local producers participated in their training program and twenty-five companies were selected for further assistance from international designers and experts. In 2014, nine participating companies exhibited their products in Ambiente trade fair in Frankfurt (Vermeulen, 2016).
- UNESCO also endorsed a project with the collaboration from CRAFT–LINK, Korean Funds in Trust, and Quang Nam Provincial People’s Committee to develop ‘signature craft products at two world heritage sites; the ancient town of Hoi An and My Son sanctuary. This project focuses on the connection to the tangible and intangible culture heritage and was targeted for local tourism market. Structured within the process is a training program which focuses on three areas of new product development project; 1) product development—taking into consideration heritage values, culture and market-based products, 2) product communication—focuses on packaging, labeling, display and sale space, 3) business management—pricing and interaction with customers. This training program was structured together with the support from designers from CRAFT–LINK, a not for profit organization that aims to support local craftspeople to sustain the local culture and improve their livelihood through assistance in production and marketing

Appendix 5: Case Studies – Context and Background (Chapter 6)

Case Study 1: The Bamboo Strands from Vinh City

This case study was conducted with the collaboration of PCD Co. Ltd. founded in 1993 in Nghi Phu Industrial Zone, Vinh City in Nghe Anh Province. PCD produces and trades craft products for export market, primarily bamboo-based products. They have worked with diverse international clients from Sweden, Chile, Argentina, US, Japan and China. Similar to other handicrafts companies in Vietnam, PCD has workers working in their factory as well as sub-contractors such as weavers and material collectors in the villages nearby. The factory workers are responsible in processing the raw material into bamboo strands. These strands will be sent to the collection/training centers. As a training center, the company sends their technical team to teach villagers/weavers basic as well as the latest weaving patterns and product designs. It is important for the company to provide continuous trainings to the weavers in order to keep a stable workforce and meet the market demands. As a collection center, the company sells the weaving materials and buys back semi-finished products or parts from the villagers. These semi-finished products are taken back to the factory to be refined, packed, and shipped to the clients. In order to manage this ecosystem, the company established collection sites approximately 160km from their factory to keep production efficiency. PCD was also involved in sustainability programs initiated by local and international organizations which provide support in local craft development, sustainable material cultivation as well as sustainable product development process. Figure 10.1 presents the environment of the factory, collection/training center, and villagers weaving in their home.





Figure 10.1: Overview of the activities in the factory, training/collection centre, and village.



Figure 10.2: The local craft scenario in Sayong.

Case Study 3: The Sayong Water Pitcher

This case study was conducted with the collaboration of *Kraftangan Malaysia*, specifically the Perak regional office. The regional offices serve as a point of contact between the organization and the local craft producers and their communities. Sayong is one of the districts in this state and also an area known for its traditional Malay style pottery. It is also part of the 'One District One Industry Program (Kraftangan, n.d.); a program that focuses on the commercialization of craft products based on local

activities and cultural identities of the area. Figure 10.2 presents the local craft settings in this area.

Through the support from *Kraftangan Perak*, the researcher had the opportunity to visit the craft village and interview four local craft entrepreneurs in the area. One of these entrepreneurs was Mr. F who inherited the family business from his father. His late father received the title ‘*adiguru*’ or Master Craftsmen in 2007 due to his expertise, skills, and craftsmanship in traditional Sayong pottery making. Their workshop is renowned for producing traditional as well as contemporary pottery products. Under the endorsement of Kraftangan, Mr. F learned the art of ceramics in Japan for three years.

Joining in the design workshop is a designer assigned by Kraftangan to take part in the research. Mr. R is an industrial designer who graduated from a local university and has been working with various craft stakeholders in the region. His roles as a designer center around developing new product concepts for productions and exhibitions, building and testing prototypes in their workshops, and working together with local craft producers to develop new products and improve their production and work efficiency. For example, in using new machines or adapting materials. At times, he is he is also involved in design activities and craft development projects organized by Kraftangan across the country. Mr. R mentioned the need for an inclusive approach to support the process of developing new products based on his experience working with the organization as well as the local craft community in Sayong. According to him, there is a gap between the mission of the organization to expand local craft products in the international and local markets and the needs and capacity of local craft producers to meet the needs of these target markets.

Case Study 4: The Lion Head

This case study was conducted with the collaboration with a local design institute and a lion dancing troupe. Malaysia Institute of Art (MIA) was founded in the 1960s as a non-profit organization and has since been responsible for training local students in art, design, and music. Through their Industrial Design program, the institute aspires to nurture and cultivate opportunities for their students to collaborate with local as well as international stakeholders. Their participation in this project offers a chance to collaborate, learn, and experience different design tools as well as the opportunity to work with local craft community; specifically, the craftspeople responsible in making the costumes used in lion dancing.

The Chinese diaspora partly contributes to the dissemination of the lion dance. Over time, this dance has evolved into notable cultural as well as sports performances with local and international audiences. In Malaysia, this conspicuous performance is one of the cultural activities practices by the Chinese communities which constitute 22.6% of the country’s population. The lion dance troupe is guided by Sifu S; who is also

responsible for managing the craft workshop. The troupe's daily schedule involves training, performing, and crafting. Their activities in the workshop can be divided into several tasks, for example, constructing the bamboo skeleton, preparing various parts—such as the lion's eyeballs, the furry balls for its nose, and the fur lining—, covering the bamboo skeletons with paper and glue, and decorating the sculpted white 3D mask by pasting sticker paper as well as painting them according to selected design themes. Figure 10.3 shows the environment and the various activities in the workshop. In average, the workshop produces 40 units of lion heads per month for local and international customers. Before the design workshop, the researcher spent one and a half day in the workshop observing and talking to the members of the troupe to understand their surroundings and environment.

Case Study 5: The Versatile Bamboo Mat

The company, DHN Co. Ltd. is situated in Ha Nam Province, 50km from Hanoi. It started as a cooperative in 1988 and transformed into a limited company in 2004; producing and exporting handicraft and home furnishing products. The company decided to invest in pressed bamboo technology almost 10 years ago due to an assurance that a well-known furniture retailer will be using this material as part of the product collections. However, when the plan did not materialize, the company was left with a risky investment. However, Mr. T continued to invest in this particular production method due to several reasons. For instance, the increase of cost in the production of conventional bamboo products, the fluctuation price for raw bamboo, fewer villagers are willing or available to work as weavers as well as an encouraging market projection on the demand of pressed bamboo products in the international market. Different from other products within the company's portfolio pressed bamboo products relies on both human and machine capacities.

The pressed sheet surface is made of Nua (*Neohouze Dulloa*) bamboo which is known to be used for fire woods, building constructions, handicrafts, pulping as well as for its edible shoots (Rao & Ramakrishnan, 1987). The inner part of the sheets is made from acacia bark collected from the furniture industry's waste. The company has developed, produced and exported various products using this particular material. For example, collapsible boxes, kitchen accessories, bath accessories (e.g., hampers and baskets), and home accessories (e.g., vases, decorative lamps). Figure 10.4 shows the activities within the company and the examples of these pressed bamboo products. The researcher started the case study with a visit to the factory to observe and understand how the pressed bamboo sheets were produced, the general activities within the factory compound, and the different products produced by the company. Similar to PDP Co. Ltd (from Case Study 1) the company also engaged with local villagers to manage a collection/training center where bamboo mats are made for the production of the pressed bamboo.



Figure 10.3: The environment of the workshop and the troupe's craft activities.



Figure 10.4: Activities within the company and the examples of pressed bamboo products.

Case Study 6: The Clay Roof Tiles

Mrs. R's knowledge, experiences, and involvements in the local craft scene are invaluable to this research, especially in understanding and connecting with local craftspeople in the East Coast of Malaysia. The meeting was held in her living room adjacent to the main office of academy which is just a few hundred meters away from scattered lines of coconut trees and the South China Sea.

Mrs. N inherited the family business which is located in Bachok, Kelantan. A state that is well-known for its artisanal objects and traditional skills and craftsmanship. Her open air workshop with earthen flooring is situated next to the village's main road and nestled within the proximity of her neighborhood. Upon arrival, a guest will most probably be welcomed by lines of molded gray tiles drying under the sun. In the middle of the workshop, a pool-sized of fresh clay waiting to be mixed and kneaded; other items such as molds, cutters, bags of ashes can be seen close by. These items are the essential tools and materials needed to make the tiles. In the right side of the workshop, rows of dried clay tiles are neatly stacked and ready to be baked in the kiln; placed at the back of the workshop. On the left side, rows of finished roof tiles were compiled, ready to be sold or sent to the customers. Some broken and rejected tiles scattered along these rows. Figure 10.5 shows the environment and surroundings of the workshop.





Figure 10.5: Scenes from the workshop.

Appendix 6: The Heritage Products (Chapter 6)

Case Study 1: The Birdcage

Birds are common and lovable pets in Vietnam creating a calm and serene atmosphere to a household. The sounds of birds' singing and the sights of them dancing reminded those who migrated to the city of their countryside. Usually, these birds are also trained to sing and dance. Bird cages come in different shapes and sizes depending on the types and amount of birds to be kept. These cages are usually handcrafted, durable, and made from bamboo, steel, or wood. The production techniques are simple therefore can be replicated easily. A birdcage has ribs between its structure for stability as well as points that allow birds to jump and dance within the enclosure. With basic forms and sturdy constructions, these cages can either be hung or put on the floor. Traditionally, birdcages are hung up to keep the birds safe from animal attacks and also provide a sense of their natural habitat. A birdcage also has a stand and a hook. The stands are usually carved with various shapes and patterns while the hooks are used for hanging and during transportation. Locally made bird cages have natural or earthy colors such as white, yellow and brown. Figure 10.6 shows examples of a birdcage found in the factory area.



Figure 10.6: Bird cages in the factory compound.

Case Study 1: The Big Basket

It is common to find various sizes of household baskets in traditional Vietnamese household made for various purposes. Different from the modern living, these baskets are made only for their functions and not as decorative objects. For instance, household baskets are commonly hidden from sight and do not necessarily have a cover. With a diameter of approximately 80cm in diameter, this particular basket is considered bigger than the average size for a household basket. Hence, such a basket is usually used by farmers to keep their farming tools. The rounded shape of the basket makes it easy to be lifted and carried to the field. The process of making this particular basket can be time-consuming as it uses a rather difficult technique. In general, various organic materials such as bamboo, rattan, and seagrass can be used to construct a household basket. Apart from these organic materials, plastic is also a conventional material used in its construction. However, organic materials have been traditionally used for generations. It is common to find household baskets in dark and earthy shades, for example, natural, black, or brown.

Case Study 2: Am Gian Tich: Vietnamese Tea Warmer

Tea drinking is part of Vietnam's history. It has a prominent presence in local rituals such as weddings, funerals as well as welcoming guests (at home or in the office). In general, drinking tea is believed to be good for human health. The ritual of tea drinking induces relaxation, evokes collective memories, and nostalgia. For instance, '*a memory of Hanoians having tea under a shade with leaves falling from the trees*'. This insulated rattan container is a common sight in a Vietnamese household, shops, and offices. It is often kept near working spaces or dining areas in which hot water will be added into the ceramic pot from time to time. This means that the same tea leaves are used prolonged in comparison to the modern practice—where tea is discarded after one drink—offering efficient use of tea leaves for daily consumptions. By the end of the day, the leftover tea leaves collected in the pot are used as compost to treat plants.

This everyday object is handcrafted using traditional method; robust and durable in structure. Traditionally, *Am Gian Tich's* baskets are weaved from natural material, for

instance, bamboo and rattan. However, contemporary tea warmer also uses plastic strands. The shape of the basket is based on the result of its weaving technique, and its overall shape has remained the same over generations. The insulation layers are often made from old clothes and waste fabrics. In principle, these insulation layers can be refurbished after some wear and tear. There are different finishes available for the inner part of the tea warmer, for example, red velvet, patterned fabric, and even old carpets. Similar to any other craft products, there are different qualities of products available in the market depending on the techniques and skills used by the craftsperson in its constructions. *Am Gian Tich* is used during winter as well as summer and capable of keeping the tea warm for up to 20 hours. During winter, this basket also serves as a mini heater, naturally providing warmth to the surroundings. Most baskets contained one-liter teapot, and these containers also kept moisture and insects away. It is a product often used by old people and suitable for big families. Young adults no longer prefer this heritage product as they are used to the way tea is served within the contemporary society; individually in a mug instead of a teapot to be shared with others. *Am Gian Tich* represents a traditional way of tea drinking in Vietnam.

Case Study 3: The Labu Sayong

Labu Sayong is a traditional water pitcher native to Sayong area and made from locally excavated clay with a luster-black glossy finish. It was believed to be initially crafted by women and represents the spirit of nature and fertility. *Labu Sayong* has a deep connection to the Malay community, especially in the state of Perak as it is used in weddings, royals' processions and other traditional rituals. The design of this water pitcher embodies traditional design principles representing values shared within the community. Malay's traditional design principles often come in the form of allegory shared orally among the local communities. For example, one of the principles used to the design of the surface pattern of *Labu Sayong* is '*tajam tidak menikam*' which means that "*what is sharp should not be piercing.*" This allegory is translated through the surface pattern dictating that any shapes or lines with sharp edges should not be touching another shape or line. This principle holds a deeper meaning within the Malay community as it serves as a reminder: "do not stab someone (or your friend) in the back." Next to this, the shape of this gourd follows another traditional Malay design principle in which parts of an object are categorized according to human anatomy (e.g., head, neck, body and feet). The surface is decorated using a stamp-impressed relief technique creating repetitive patterns with nature as its motifs. Apart from its decorative purpose, this technique also creates frictions for better grip during use. Overall, the outlook of the gourd represents balance and harmony, through its feminine flow, and symmetrical form.

This symmetrical bottle gourd exerts significant influences in the development of the local craft industry inspiring various types of products including souvenirs, corporate gifts, and home decor items. The product diversification was also influenced by the

adaptation of new technology in the production process. For example, traditionally, this water pitcher was made using the pinching technique; however, casting technique is currently being used to increase productions. Using the traditional technique, clay that has been shaped and decorated is baked in a kiln. This technique is known as the black firing technique; a method where the baked gourds are put into rice husk right after they came out from the kiln giving the gourd its black-luster finish and a certain amount of carbon content embedded. This carbon content influences the quality of the water, and due to this process, the local people believe that the water kept in this gourd is good for the body. Next to this, the porosity of this pottery lowers the temperature of the water it contained providing cool water on a hot tropical day. Apart from the black-firing technique, currently there are also other finishings available such as natural clay, painted, and a gourd combined with different material such as metal (silver and gold) and rattan. However, the gourds that made of these contemporary finishes are no longer used to contain water instead they are sold for decorative purposes only.

Case Study 4: The Lion Head

The lion head (Figure 10.7) is a costume used to mimic a lion's various emotions and expressions during the lion dance performance. This traditional dance is part of the cultural heritage of the Chinese communities in Malaysia and also abroad. The dance symbolizes joy, happiness, and blessings. It is also considered as a sign of good luck, a beginning of a new chapter in life, and as a means to ward off bad omen, negativity, and evil spirits. With thousands of years of history, this folk performance keeps on changing and evolving with various stories attached to it. For instance, it is linked to the Han Dynasty and believed to be part of soldiers' entertainment. Today, this dance still has a significant influence on cultural practices in various countries such as Taiwan, Vietnam, Malaysia, Singapore, and Hong Kong.

Figure 10.7: The lion head.

The lion dance explored in this case study consists of choreographic movements by two acrobatic dancers accompanied by the beating of drums, gongs, and cymbals. These choreograph movements require dancers' agility to move in harmony with the music and each other. Their steps and movements are coordinated among high poles topped with a small circular disc as a platform. A small mistake can cause injuries. These steps and movements stir audiences' emotion, creating a sense of excitement as well as jitters and nervousness as both dancers step swiftly while



jumping from one pole to the other. The first dancer would hold the lion head over his shoulder and move according to the choreograph steps while the second dancer would match from the back creating synchronized movements that imitate various emotions such as a playful, sorrowful, boastful or joyful lion. During the dance, the first dancer uses a small string attached inside the mask to move the lion's mouth, eyes, and ears which are instrumental in creating the lion's various expressions and emotions.

Bamboo, rattan, square aluminum-tubes and masking tapes are some of the primary materials used to make the lion head's skeleton. The master has developed a technique which uses masking tape (instead of strings and wires) to secure the bamboo linings (for the skeleton) tightly together. Next to this, he also uses aluminum tubes instead of rattan for a lighter skeleton. Using the papier-mache technique, the skeleton is covered with layers of bamboo papers and glue producing a white sculpted 3D mask. This white 3D sculpture is then decorated with various colorful designs using paints, stickers, and fur. The lion head also has a built-in mechanical system that allows movements of the mask's ears, eyes, and mouth. A small pillow is added at the back of the mask to support the dancer's head.

The aesthetic elements of lion heads varied according to the purpose of performance; usually, these elements symbolize characters from myths and histories. However, the designs of the patterns are inspired by both traditional as well as contemporary motifs; for example, the master has adapted *batik* motifs in some of his creations. The motifs are also influenced by different elements of nature such as flames, eagles, Leo, Phoenix and even Godzilla. The combinations of these patterns with warm, cold, and neon colors become one of the key attractions to this grand and majestic mask with an exaggerated proportion to its users.

Case Study 5: Liếp cột: Enforced bamboo mats

Liếp or the bamboo mat is the main material in pressed bamboo sheets. In the old days, a household would often have more than one *Liếp* at home. These mats can either permanent or temporary fixtures in the house. There are different traditional types and styles of constructing these mats. For example, *Liếp* can be weaved from of bamboo stems that have been beaten creating giant weaved sheets.

Traditionally, the bamboo mat can be transformed into different shapes, for example, it can be rolled, flatten onto the ground and constructed vertically or horizontally using bamboo or wood as its structure. This capability makes this product a versatile household item in Vietnam. Traditionally, *Liếp* is used as a construction material, for example, to build fence, walls, ceiling, balcony and it also rolled into a cylinder for storing rice. During the war, *liếp* was used to as one of the materials to build blockhouses. Although *Liếp* is versatile, strong, sturdy, and durable; it is also perceived as products used by the villagers (or the poor) thus lack of prestige and status among the contemporary urban society. This particular product is no longer common in a

Vietnamese household; nevertheless, it still can be found in construction areas as well as the countryside.

Presently, these bamboo mats have evolved to meet the demands of the contemporary society, for instance, *liệp* is used as part of spa or resort interiors. Next to this, the pressed bamboo sheets produced by the company are one of the examples of its evolution. This handwoven mat requires bendable and sturdy bamboo, and there are two types of bamboo are known to be suitable for its construction—*‘Luo’* and *‘Nua.’* The bamboo mats also have different patterns and finishes, for example, natural, stained, two-toned, or steamed (carbonized). Next to this, two common weaving patterns are herringbone and cross (checkered) pattern. These patterns are also common traditional motifs with the lowest production cost.

Case Study 6: Atap Singgora

These unglazed clay roof tiles are one of the features in Malay traditional houses in the East Coast of Malaysia (Figure 10.8). In essence, this type of roofing is common across the South East Asian region. For example, V-shaped tiles are typical in the East of Malaysia and Thailand, U-shaped tiles in Myanmar and tiles with straight lines are ordinary in Vietnam and Cambodia.

In traditional Malay architecture, the arrangement of these red tiles creates scale-like patterns. The combination of these red tiles and the dark wooden structures with elaborate carvings is one of the well-known features of traditional Malay houses. In these traditional houses, the tiles are attached to wooden strips and can be replaced from the inside. The clay roof tiles are light, porous and do not retain or absorb heats—a favorable characteristic in a tropical country. They are relatively thinner compared to the modern roof tiles. Traditionally, thinner tiles are preferred as they are considered to be aesthetically pleasing. This preference, however, makes a product that is already prone to breakage more fragile.

The workshop still uses the same traditional method to produce these tiles and almost all the essential tools used are either homemade or locally sourced. Although they managed to maintain the same production process, the properties of the raw material excavated in the area are no longer the same. Presently, salt is added in the clay mix to maintain the quality of the tiles. In comparison to other traditional craft products, the process of making these tiles can be rather crude; however, the craftspeople are nimble with their hands and feet as they knead, mold, shape and baked the clay into pieces of tiles ready to be sold to the market. Currently, *Atap Singgora* is often used in traditional houses and culture-oriented structures such as resorts, museums, craft centers and gazebos.



Figure 10.8: Stacks of *Atap Singgora* (left), view of the tiles from inside (middle), the tiles in combination with structures with traditional wood carvings (right).

Appendix 7: The Evaluation Cases (Chapter 6)

Evaluation Case 1: In Collaboration with Regio-Crafts

Title: Exploring heritage values and building narratives as a marketing strategy.



Figure 10.9: Scenes from the workshop in Paggia, Greece.

Evaluation Case 2: In Collaboration with House of Design
 Title: Vakmanschap 21e eeuw (Craftsmanship in the 21st century)



Figure 10.10: Scenes from the workshop in Groningen, the Netherlands.

Evaluation Case 3: Conducted by House of Design in L'Éliana, Spain
 Title: Craft as added value for 3D-printing education–Valencian crafts



Figure 10.11: Scenes from the workshop as part of 3D in Education (source: House of Design).

Evaluation Case 3: Conducted by House of Design in the Province of Friesland, the Netherlands

Title: Social design lab for European Capital of Culture Leeuwarden.



Figure 10.12: Scenes from the workshop as part of the project www.iterfskip.nl (source: House of Design).

Appendix 8: Analysis 2 – Content Analysis Result (Chapter 7)



Detailed content of the analysis can be accessed via the link below:

<https://drive.google.com/file/d/10UXgsx8jeLTgcgyKBbSo411VFcvi1Ez3/view?usp=sharing>



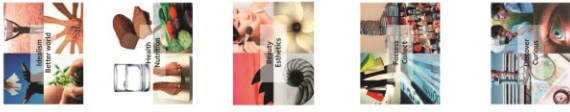



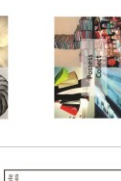



Short URL: <https://goo.gl/4EHu54>

Appendix 9: Analysis 3 – The Design Direction Framework (Chapter 7)

From Case Study 1: Bamboo Strands from Vinh City:

brand values	market trends	extracted values	product range
 <p>order & structure beauty & aesthetic better world safe & secure reputation & recognition</p>	<p>2013</p> <p>stories, modern, clean, family of product range, mix & match, fresh, experimenting with material</p> <p>trends inventive, sensitive, expressive</p>  <p>sleek, clean, in control, geometry design, creating textures, accentuate hues, personal environment</p>	<p>its big! nice! nice & interesting shape easy to lift ribs for bird to skip and dance green material calming and serene effects</p>	<p>furniture: tv cabinet, curtains</p> <p>lighting: hanging lamp, standing lamp</p> <p>functional decorative items: picture frame, vase, candle holder</p>

From Case Study 3: The Sayong Water Pitcher:

<p>target values</p>  <ul style="list-style-type: none"> • Products that are the most innovative, functional, and sustainable • Products that are aesthetically in contemporary living environments • e.g. high-tech, high-end, and uses traditional weaving techniques • Used in modern design contexts 	<p>market trends</p>  <p> sleek clean in control geometry design accentuate hues creating textures new technique strict personal environment </p>	<p>human drivers</p> 	<p>extracted values</p> <ul style="list-style-type: none"> Shape & surface design - follow fit function Porosity - naturally cooling water Repetitive pattern Black ring - Clean fitting Ergonomic shape - easy to carry 	<p>product range</p> <ul style="list-style-type: none"> functional <ul style="list-style-type: none"> water pitcher drinking set fruit bowl decorative <ul style="list-style-type: none"> lighting vase planter
<p>sustainable values</p>  <p>Notes: Incorporate local materials and processes</p>  <p>Notes: Encourage local design and production that also consider part of the existing economy for the sake of sustainability</p>  <p>Notes: Preserve local culture</p>  <p>Notes: Encourage local design and production that also consider part of the existing economy for the sake of sustainability</p>	<p>consumer trends</p>  <p>Notes: Encourage local design and production that also consider part of the existing economy for the sake of sustainability</p>  <p>Notes: Encourage local design and production that also consider part of the existing economy for the sake of sustainability</p>  <p>Notes: Encourage local design and production that also consider part of the existing economy for the sake of sustainability</p>			

Appendix 10: Analysis 3 – The Mapping Results (Chapter 7)

This section presents the overview of results of the mapping process illustrating the connection between the statements and the conceptual ideas from Case Study 1, 3, and 5. Details for each case study, the objective of the design workshop, the selected statements mapped onto the Design Direction Framework, as well as the links between the statements and the conceptual ideas generated in Session 3 are described.

Case Study 1: Bamboo Strands from Vinh City

The design workshop for Case Study 1 was structured with the aim to support the craft company to develop their first product collection of home-decor and lifestyle products targeting the European middle market. Five different exploratory sessions were conducted with the fourth session being the exploration of two heritage products (Figure 7.26). Six statements from the mapped PV canvas were selected for the Design Direction Framework (Table 10.1). Two statements from the Aesthetic layer and one statement from each of the following layers—Interaction, Performance, Construction, and Meaning. The Idea Generation session generated eighteen conceptual ideas based on four ranges of products, picture frame, candle holder, vase, and lighting system.

Layer	Statement	Description
Aesthetic (AES-1)	<i>'Nice/Interesting shapes'</i>	Relates to the numerous selections of forms and shapes of bird cages that are available locally. The diversity of different types of bird cages in Vietnam reflects on the local practice of keeping birds as pets.
Aesthetic (AES-2)	<i>'It is big/ Nice'</i>	Refers to the impression on the farmer's basket massive size. In a traditional home, this gigantic piece of items is apparently hidden from view pointing out that it is valued for its functionality rather than aesthetic. However, its massive size is considered as an interesting feature for a modern interior.
Interaction (INT)	<i>'Easy to lift'</i>	Refers to the shape of the basket which makes it easy to be lifted and carried to the farm. Coded as inherited in Analysis 2.
Performance (PER)	<i>'Ribs for birds to skip and dance'</i>	Refers the lines and the ribs of a bird cage that allow birds to skip and dance in the enclosure. Coded as inherited in Analysis 2.
Construction (CON)	<i>'Green material'</i>	Relates to the use of green material often in the construction of bird cages. For example, the use of a single material for production and it is common that the materials are organic

		and available locally—such as wood and bamboo.
Meaning (MEA)	‘ <i>Calming effect</i> ’	Refers to the peaceful and comfort feeling created by the sound of birds singing and chirping at home. This atmosphere at times reminded those who venture into the city of their life in the village.

Table 10.1: The selected statements from the PV canvas and their descriptions

From Figure 10.13, it can be seen how the concepts are linked to the selected statements, the different layers of the MPV model, and finally, to the selected heritage product. The figure illustrates eighteen conceptual ideas which have been categorized into nine groups representing different combinations of the statements. The figure shows that nine concepts are linked with Group 2 with the combination of **AES-1**, **PER**, and **CON**. This combination indicates conceptual ideas that explore different forms and shapes, adopt the lines and ribs of the birdcage, and use of green materials.

In connection with individual statements, the first statement, **AES-1**, is linked to fifteen product concepts. Although the idea of exploring different shapes may seem like a common aspect of the idea generation process, this statement contributed towards a meaningful outcome in this case study. The notion of exploring different product shapes triggered the approach of developing one production technique (for example, a new weaving technique) which is then translated into various forms. This adaptation can be seen in sketches C2¹¹, C13, and C16. The second statement, **AES-2**, is linked to seven conceptual ideas that adopted the gigantic feature of the farmer’s basket. For example, C15 illustrates a standing lamp with a wide circumference shade and C7 shows an over-sized bamboo tray for tea light candles. The third statement, **INT**, is also linked to seven conceptual ideas, however, instead of focusing the actual shape of the farmer’s basket that makes it easy to be lifted the exploration focuses on the ergonomic aspect of each concept. In this sense, this particular statement was translated into product features that are associated with the ease of use in products, for example, how a lamp can be easily transported, assembled, and attached.

The fourth statement, **PER**, is the most frequently adopted statement. A total of seventeen conceptual ideas are linked to lines and ribs of the birdcage. This statement is integrated into different product styles and outlook, for example, in C1, C3, C15, and C16. The fifth statement, **CON**, is linked to fifteen product concepts. In regards to

¹¹ C1 refers to Concept No. 1 and so forth.

this statement, the focus of the discussion shifted from the materials used in bird cages to the core material currently used by the company—the bamboo strands. The company has been sourcing and processing the bamboo strands in a responsible manner. First, all bamboo originates from sustainable forest cultivation projects within the province. Secondly, these bamboo materials have been processed, prepared and weaved by the various production points within the local communities. However, at the time the design workshop was conducted, the narratives related to this sustainable practice were not included or emphasized in any part of the company's marketing content, hence, not shared with their clients and potential buyers.

Finally, the sixth statement, **MEA**, was not translated directly to the conceptual ideas instead it was adopted as part of the design principle applied in all of the concepts. This particular value triggered a discussion about creating a calm and serene experience or feelings through craft products. In other words, this principle refers to the idea of bringing a sense of peace and tranquility in a household. In the subsequent product development phase, this particular statement was also used as part of the marketing story for the product collection.

A year after the implementation of the design workshop, the company developed a new product collection in 2013 called 'Long Chim' or 'Bird Cage'. In this collection, two new techniques using existing bamboo strands were developed. As mentioned, the collection had adopted the sixth statement as part of 'Long Chim's' marketing content, however, instead of the calming sound of birds, the collection focuses on lighting as a medium to create a calm and serene ambiance to a household. Next to this, the company now also included their sustainability practices as part of their general marketing content with the support from another organization in the following year. This result demonstrates the different ways in which the selected statements were adapted in the product development process. These results indicated that the statements were not only adapted in the initial conceptual ideas and a final product but were also associated with the product collection as well as the company's general marketing strategy.

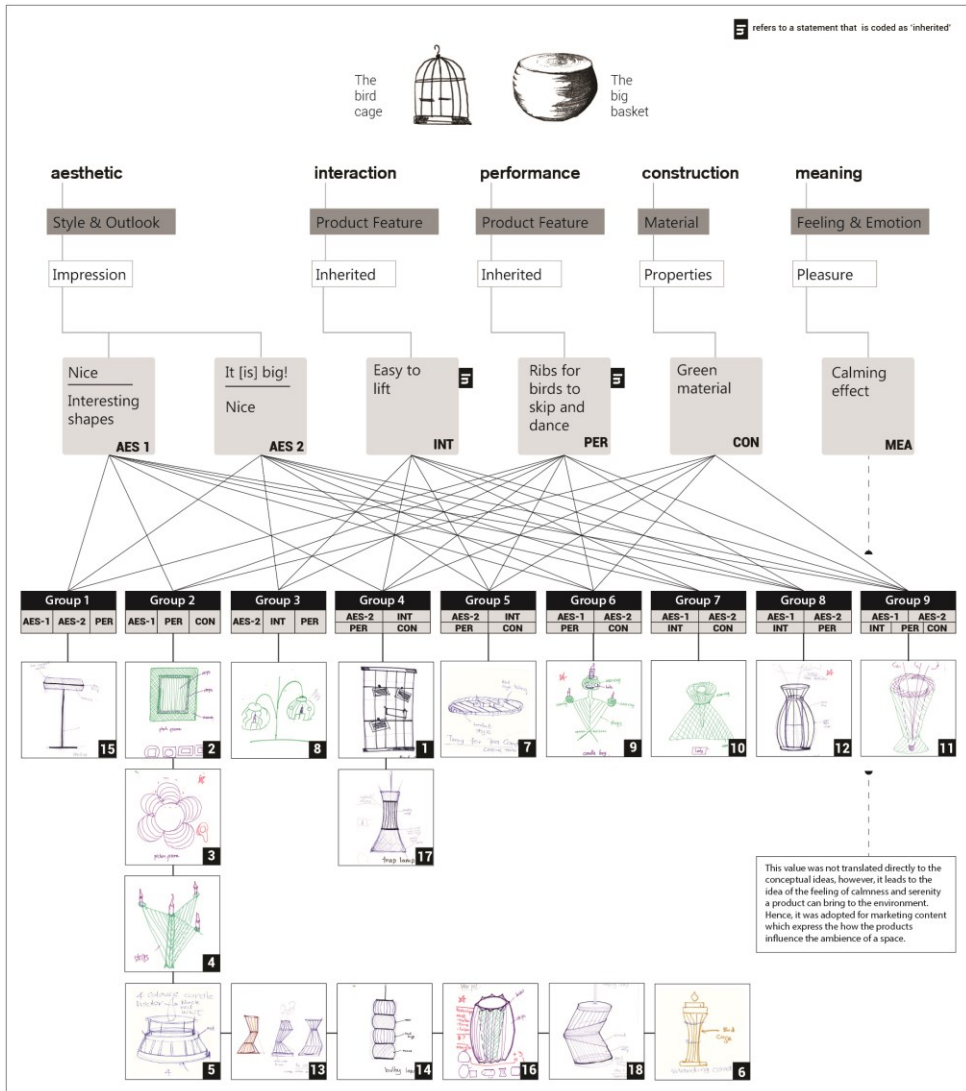


Figure 10.13: The links between conceptual ideas and the selected heritage products.

Case Study 3: The Sayong Water Pitcher

The design workshop for this particular case study was structured with the aim to develop a sustainable product collection based on the *Labu Sayong* while focusing on the black firing technique and locally excavated material. The craft entrepreneur involved was also keen on combining traditional pottery and the techniques related to ceramic-making. Six different exploratory sessions were conducted, and the fifth session was the session ‘*Exploring Heritage Products*’ (Figure 7.26). Five statements from the mapped PV canvas were selected for the Design Direction Framework (Table 10.2). Two of these statements are from the Aesthetic layer and one statement each

from the following layers—Interaction, Performance, and Construction. Out of these five statements, three of them are coded as part of the inherited values. Eighteen conceptual ideas were generated in the *Session 3* based on five different ranges of products: lighting, vase, planting pot, fruit bowl, and water pitcher.

Layer	Statement	Description
Aesthetic (AES-1)	<i>‘Shape follows function’</i>	Refers to the shape of the water pitcher that is perceived to be influenced by its function. This statement encompassed that the forms follow the function of an object.
Aesthetic (AES-2)	<i>‘Repetitive pattern’</i>	Refers to the surface design for the water pitcher which uses impressed-relief technique with traditional motifs to create its decorative pattern. This technique also creates a rough surface increasing friction during use, thus, improving the overall product handling.
Interaction (INT)	<i>‘Ergonomic shape [easy] to carry’</i>	Refers to the shape of the water pitcher with a neck like figure that makes it easier to hold and carry.
Performance (PER)	<i>‘Naturally cooling water/porosity’</i>	Relates to the product feature in which water evaporated through the pores of the clay pitcher lowering the temperature of the remaining water—the concept is similar to ‘evaporative cooling.’
Construction (CON)	<i>‘Black firing / Open firing [technique]’</i>	Refers to the traditional method used to produce the water pitcher. In the old days, instead of using a kiln to bake, dried clay pitchers are fired in trenches filled with dry woods in low-temperature settings (700–900 degree Celsius). Once done, the red-hot baked pitchers are placed directly into a pile of paddy husk. This process produces the black luster finish for the water pitchers and is locally known as the ‘black firing’ technique.

Table 10.2: The selected statements and their descriptions.

Figure 10.14 illustrates the links between the conceptual ideas and the *Sayong* water pitcher from Case Study 3. Eighteen conceptual ideas generated in *Session 3* were classified into nine groups. Group 7 has the most number of concepts and is linked with the combination of these statements—**AES-1**, **AES-2**, **PER**, and **CON**. This combination represents concepts that are associated with shapes that follow functions, adopt the traditional surface design, utilize the ‘evaporative cooling’ properties of earthen potteries, and use the black firing technique as it method of production.

The first statement, **AES-1**, is associated with the most concepts. A total of sixteen conceptual ideas are identified with shapes that are associated with a certain function. For example, in C15 and C17, the shapes of the water containers are similar to contemporary glass or plastic containers. The second statement, **AES-2**, is associated with fifteen product concepts. There are various adaptations in relation to how the traditional surface design is integrated in these product concepts. These adaptations comprise the use of traditional motifs and the impressed relief technique (e.g. C5, C8, and C15), incorporating the impressed-relief technique in combination with modern motifs (e.g. C6, C7, C16) and adopting traditional motifs with different technique such as carving (e.g. C1, C10, and C13). The third statement, **INT** is linked with ten conceptual ideas. These concepts consist of different features to handle the product, for instances, its stability, and ease of use (e.g., C4, C10, C8, and C17). The fourth statement, **PER**, is associated with thirteen product concepts. These concepts utilized the evaporative cooling due to the porosity of the pottery. This particular feature is relevant to specific product ranges such as the water pitcher (C14, C15, C16, C17, and C18), pots for plants (C7, C8, and C9), and fruit bowls (C11 and C12). Lastly, the fifth statement, **CON** is associated with twelve product concepts. However, the concepts connected to this statement focus only on the black firing technique as open firing technique is no longer viable to be practiced. Furthermore, most local craft producers either have their own kiln or access to kilns owned by cooperatives.

In summary, the product concepts generated in this case study show that the combination of traditional process—the black firing technique—and a new method learned by the craft entrepreneur—ceramic making. This direction is in line on the objective of the design workshop and generated a selection of product ideas that represent a collection comprising products with the black luster finish from traditional pottery and colorful accents from ceramics. The black firing technique creates one of the primary features of the water pitcher—the black luster finish which is intimately connected to the local culture identity. The conceptual ideas also present different adaptations of the impressed-relief technique, notably in integrating traditional motifs on colorful ceramics and modern motifs on traditional potteries. Similar to the previous case study, not all the statements are included in each conceptual idea. Some statements are more dominant than the other, especially, those that are common to the craft representative. For instance, the traditional technique and potteries that cool water naturally; both values are shared and treasured locally. This shows that certain values transcend beyond the heritage product as these values are already part of the identity of the local craft community. These adaptations reflect on the different degree the values of heritage product can be integrated during the product development process, specifically in connection to the local community, a product collection as well as individual products.

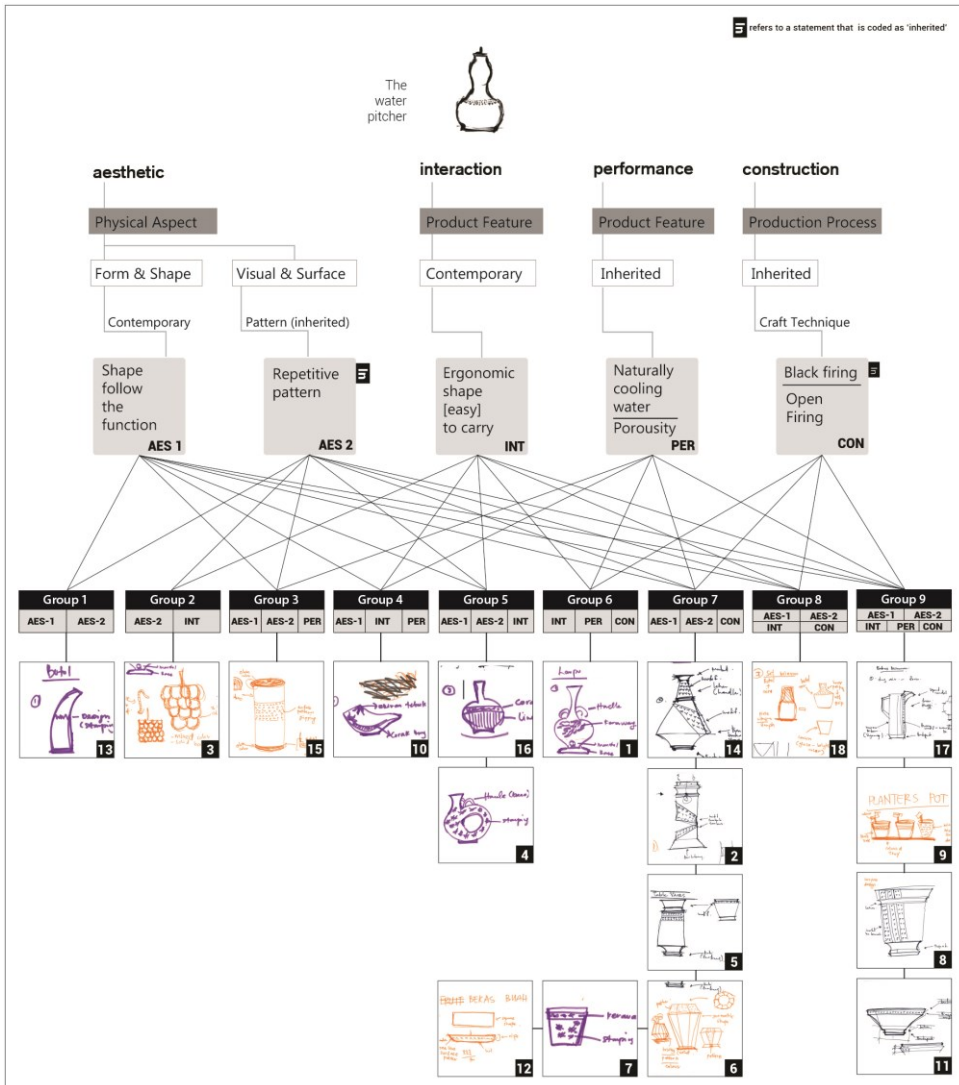


Figure 10.14: The links between conceptual ideas and the Sayong water pitcher.

Case Study 5: The Versatile Bamboo Mat

The design workshop for Case Study 5 was structured with the aim to develop a product collection for everyday objects based on the pressed bamboo mat or *Liép*. The products within this collection were to be designed for mass-production, cost-effective with connection to the local cultural heritage. Five different exploratory sessions were conducted in this case study and the session *‘Exploring Heritage Products’* was the first session performed (Figure 7.26). Five statements from the mapped PV canvas were selected as part of the Design Direction framework (Table 10.3). Twelve conceptual

ideas were generated based on three different product ranges: kitchen and tabletop, bath and storage.

Layer	Statement	Description
Aesthetic (AES – 1)	<i>‘Ages well (like wine)’</i>	Refers to the changes of the mat’s surface after being used for a certain period. A weaved bamboo surface soften due to a certain wear which enhances its aesthetic—creating rustic, traditional and authentic feel.
Aesthetic (AES-2)	<i>‘Traditional patterns— herring bone/checkered ([the] cheapest)’</i>	This statement refers to two inherited weaving patterns; ‘herring-bone’ and ‘checkered.’ These two patterns are the easiest to learn and fastest and cheapest to produce.
Interaction (INT)	<i>‘Rolled; Flatten; Horizontal; [with] Support system.’</i>	This particular statement includes some sketches which relate to the different ways local people are using the <i>Liép</i> or bamboo mat. Essentially, this statement highlights the various interactions created from a single bamboo sheet.
Meaning (MEA-1)	<i>‘Giant Weave—use beaten bamboo (whole)’</i>	Refers to an old technique of making the <i>Liép</i> which uses flatten bamboo sticks as the strands for weaving. This statement is mapped to the Meaning layer since this technique is no longer a common practice among the local community.
Meaning (MEA-2)	<i>‘Flexible; Sturdy & firm; deeply rooted inside the earth.’</i>	This statement also includes a sketch (refer to Figure 6.21 in Part 2 analysis) relates to the traits and characteristic of bamboo plants that are closely connected to the traits and characteristic of Vietnamese people. For example, apart from using bamboo as a material for everyday objects, this plant is also being grown as a fence forming a shield from the strong and stormy weather. This is possible because of the flexibility as well as sturdiness of this plant. In a way, these traits also reflect a society that is strong and sturdy yet also flexible and resilient to overcome winds and storms of life.

Table 10.3: The selected statements and their descriptions.

Figure 10.15 shows the links between the conceptual ideas and the bamboo mat (or *Liép*) from Case Study 5. Twelve conceptual ideas were generated and classified into four groups that represent the different combination of the statements. The result shows that Group 1 is associated with the most conceptual ideas. These concepts

comprise the combination of the first statement, **AES-1** and the second statement, **AES-2**, representing a selection of products that adopted the surface of the bamboo mat as part of its aesthetic and two traditional weaving patterns that are cost and time effective. The selection of these two statements relates to the aim of the design brief, to develop cost-effective products using the company's current production capability—the pressed bamboo sheets.

The third statement, **INT**, refers to the multi-purpose use of the *Liép* and is connected to four product concepts. This particular statement is adopted through different product features such as compact and collapsible design (C8), modular design (C9, C10) as well as multi-purpose feature (C11). Although modular, compact, collapsible, as well as multi-purpose are features commonly associated with contemporary products the way *Liép* is used by the local community showed that these features are already part of Vietnamese traditional design. The fourth statement, **MEA-1**, is linked to four product concepts. However, instead of adopting the old giant weave technique in which a whole bamboo stick is flattened and weaved, these concepts adopted a new technique based on the material available in the company. By combining three to five bamboo strands (the type of material that is currently being used by the company) wider bamboo strips are formed before being weaved into a mat. The adaptation of this technique can be found in C1 and C2. Finally, the fifth statement, **MEA-2**, is associated with the meaning of bamboo for the local people. Bamboo is a plant that is intimately connected to Vietnamese; its characteristics are also reflected in a society that is strong, firm, resilient and also flexible in overcoming challenges. As bamboo is the core material used by the company, this particular statement is relevant to the company and can be adapted as part of their marketing. This content connects the products and business closer to the local cultural heritage creating means for the company to share the importance and meaning of bamboo from local and traditional perspectives.

In conclusion, the concepts generated in this case study highlight the combination of existing statements which are already part of the company's values as well as new values that can be integrated into their new product collection and marketing content. These values relate to the use of bamboo mat as a product's surface, and the adaptation of traditional weaving patterns that are cost effective. Next to this, the conceptual ideas also include traditional product features that can be linked to contemporary product features such as compact and collapsible objects, multi-purpose products as well as a modular design feature. Furthermore, the concepts also reinterpret an old age technique using existing material currently available within the company. Lastly, the result also identified one of the many stories related to bamboo and its roles in Vietnam's everyday culture as well as its people. The result in this case study also indicates the different levels in which the statements are integrated into the product development process, notably in a product-level, collection-level, as well as company-level.

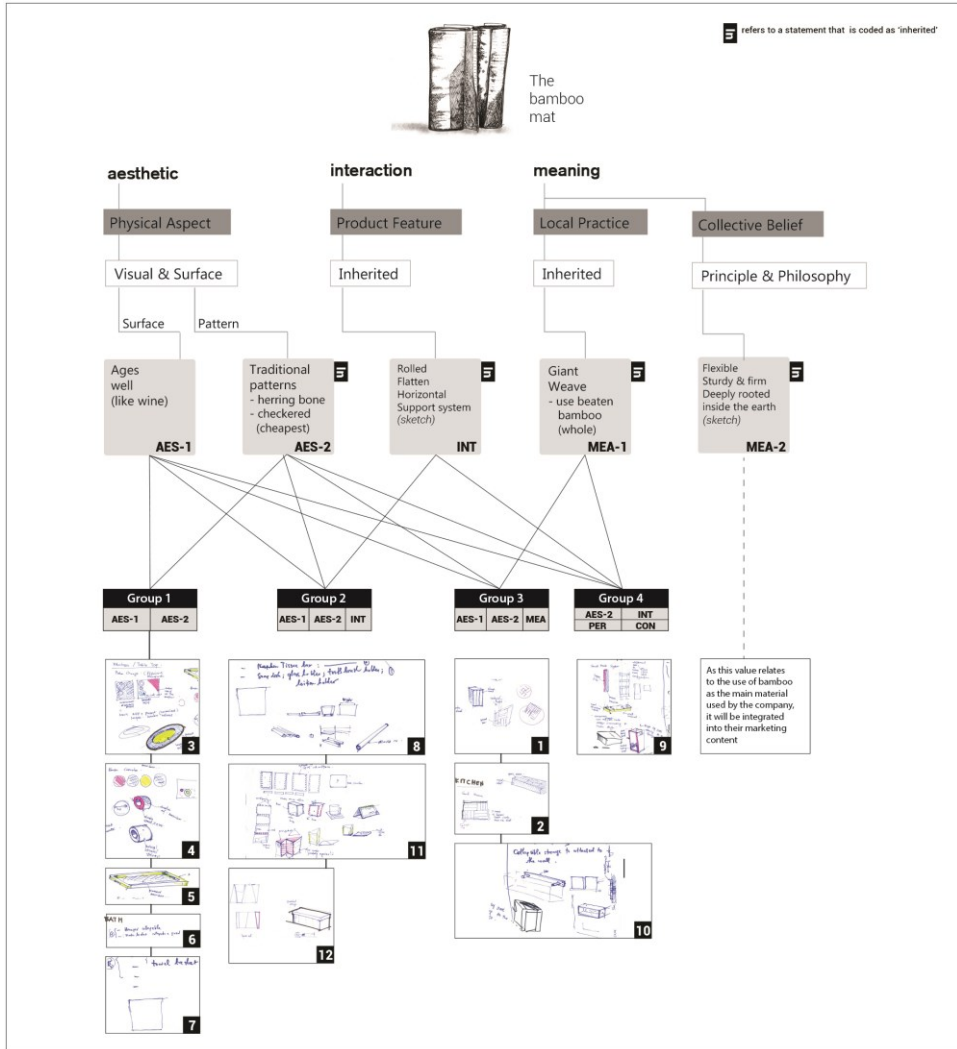
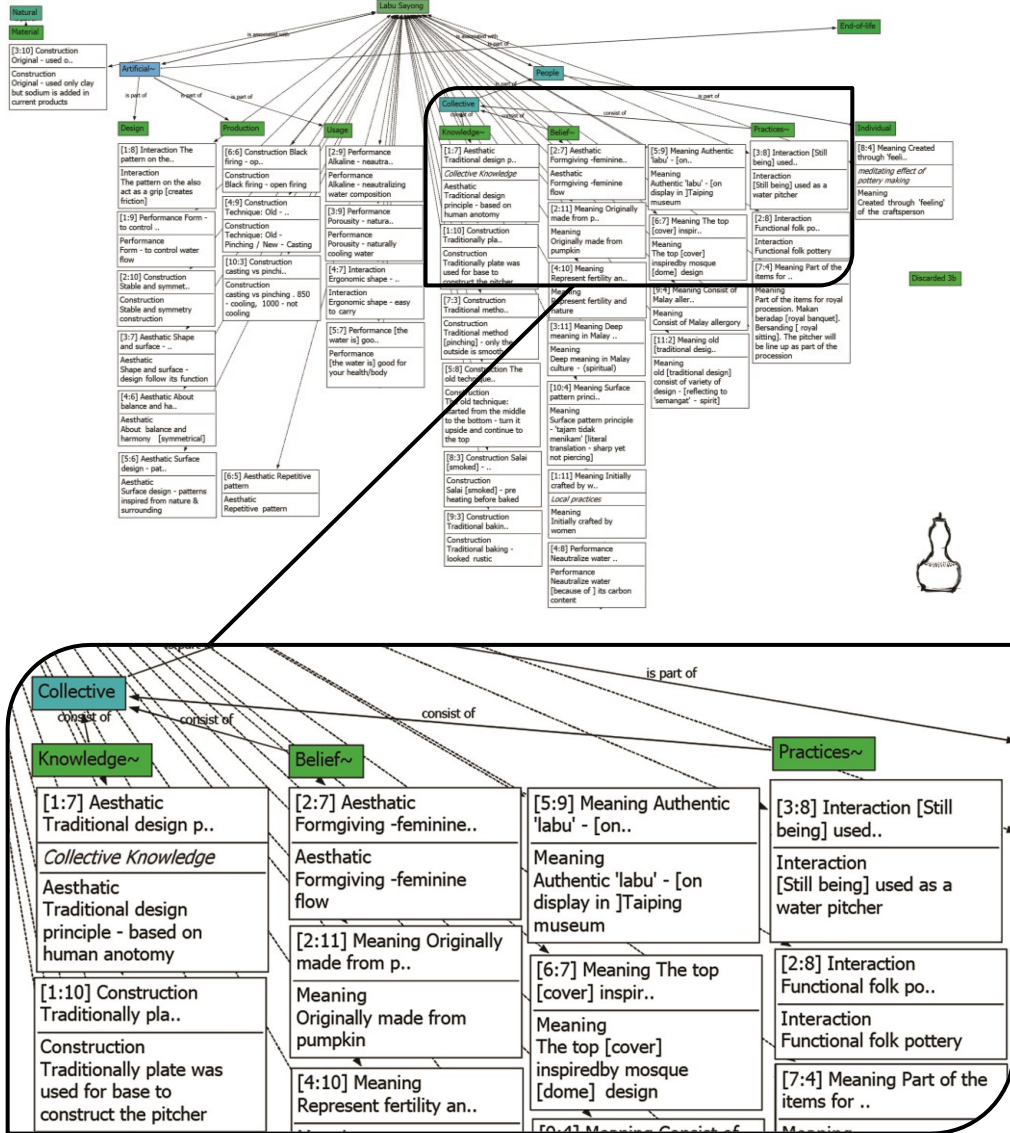


Figure 10.15: The links between conceptual ideas and the Liép.

Appendix 11: Analysis 4 – Content Analysis and Pattern Matching Results (Chapter 7)

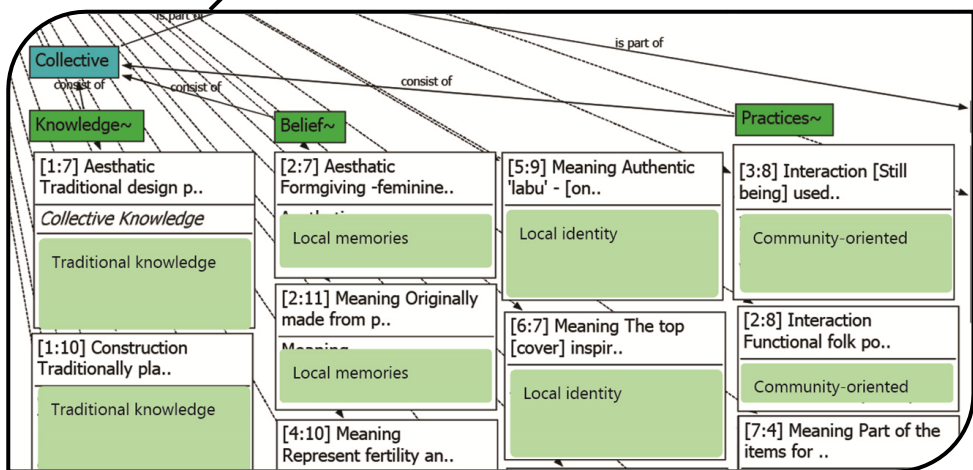
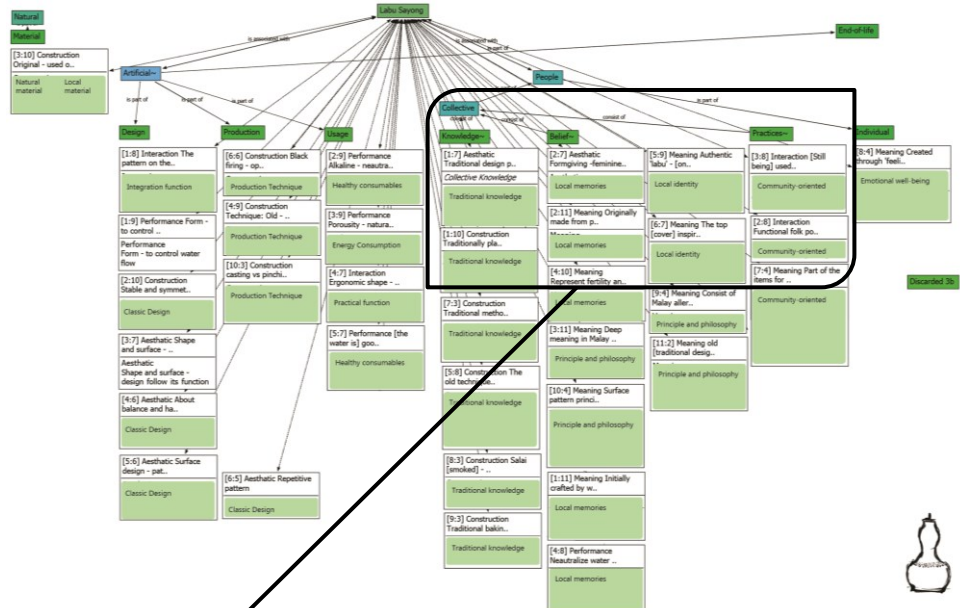
An example of the result for content analysis:

Labu Sayong



An example of the result for pattern matching analysis:

Labu Sayong



Detailed content on the result of this analysis can be accessed via the link below:

https://drive.google.com/open?id=1VFcm_DkDxIMeUEZKiI2gbAIUHK4luWkI

Short URL: <https://goo.gl/L6qMN>

Appendix 12: Analysis 4 – Elements of Sustainability Results (Chapter 7)

This appendix describes the elements of sustainability in relation to four heritage products: *Ấm Giành Tích* (the Vietnamese Tea Warmer), *Liếp* (the bamboo mat), *Labu Sayong* (the water pitcher) and *Atap Singgora* (the clay roof tiles). Each description comprises a brief introduction of the heritage product and the result of the analysis which includes the summary of the connections between the parameter (with the number of statements coded), elements of sustainability, number of statements matched to the elements, and their descriptions. Details of the content analysis and pattern matching can be found in Appendix 11. Next, the research also discusses the elements of sustainability associated with forest-based and earth-based heritage products based on the three tangible aspects of sustainability: natural, artificial, and people.

Case Study 2: *Ấm Giành Tích* (Vietnamese Tea Warmer)

Tea drinking and the *Ấm Giành Tích* have been part of Vietnamese society for generations. This insulated rattan container is a common sight in Vietnamese households, shops, and offices indicating the prominent tea drinking culture among the local people. The *Ấm Giành Tích* was selected in Case Study 2 as it is well-known by the participants, their families, local peers, and communities (see 6.3.2). A total of 53 statements were converted for the content analysis, and the result of the coding process and the pattern matching are presented in Table 10.4.

Parameter (number of statements coded)	Element of Sustainability	(no. of statements matched)	Description
Material (4)	<i>Natural material</i> <i>Recycled material</i> <i>Local material</i>	3	<i>Ấm Giành Tích's</i> main basket is traditionally made of rattan [98:9] which is native to Vietnam [104:7]. The insulation is made of recycled material, such as old fabric, cloth, and carpet was used [95:9] .
Design (4)	<i>Classic design</i>	2	The design [100:6] and shape [99:6] of tea warmer that never changes.
Production (5)	<i>Production technique</i>	3	The traditional production process that makes efficient use of the raw material [96:9]. For instance, it makes use of the outer skin of rattan as the lining to weave around the main coil structure which is made of the inner part of the stem [97:9]. Another technique refers to process of making the insulation using

			recycled material that is easy to repair and upgrade [103:7].
Usage (11)	<i>Energy consumption</i> <i>Healthy consumables</i> <i>Beneficial waste</i> <i>Repair & Upgrade</i> <i>User-product relations</i>	9	The tea can be kept warm for hours [96:8], and it is also being used as a mini-heater (for example, warming up the hand) [98:8]. Both practices are useful especially in Vietnam's winter season [102:6]. Tea drinking is also part of healthy consumable and the leftover tea leaves are used as compost to treat plants [108:2]. As mentioned in the 'Production' parameter, the production technique allows the inner parts of the warmer to be repaired or upgraded easily [100:8] which enhance the product longevity [99:8]. It offers a distinct way of tea drinking in which one liter of tea is made each time [101:6]; this practice reduces the amount of tea used [107:3] in comparison to the common 'one mug, one tea bag' practices. This product indicates a frugal consumption [104:6] and also the Vietnam tea drinking ritual.
End-of-life (0)	-	-	-
Collective Knowledge (5)	<i>Local knowledge</i> <i>Traditional knowledge</i> <i>Skill and technique</i>	4	The construction of the rattan basket is made using similar traditional weaving techniques [99:9] with minimal mechanical support [107:4]. The technique creates a good construction and a strong weaving structure [105:4], and it is relatively easy to learn.
Belief (11)	<i>Local memory</i> <i>Local identity</i> <i>Celebration & ritual</i>	10	Nevertheless, the quality of weaving can differ depending on the target markets [100:9].
Practices (8)	<i>Local practice</i> <i>Healthy living</i> <i>Family-oriented</i>	8	This product is also associated with shared memories among local people. For instance, the old Hanoi [98:10], local songs, and poetries [101:8]. The statements also represent certain local identities, for example, the national colors [104:8], often used by families with strong traditional values [99:10] and a way of enjoying tea that is distinct to Vietnam [95:10]. Tea drinking has a long history in Vietnam [95:10] and it is an integral part of traditional customs; offered to welcome guests, in wedding celebrations as well as funerals [96:10]. In general tea drinking is perceived to be good for one's health [104:5].

			Due to their collective belief, tea drinking is an everyday practice [97:7] for the local people. Fresh tea [97:10] and herbal tea [109:2] are often consumed for their health benefits. Although still widely used among the older generation [95:7], this product is no longer common among the younger generations [95:7]. It is also often used by big families [96:7]. The basket is often directly used to serve the guests [100:7] and the <i>Ám Giành Tách</i> represents a natural way to keep the teapot [105:3].
Individual (3)	Physical well-being Emotional well-being	3	Tea drinking is known to promote physical well-being and relaxation [102:8]. In the modern practice, tea is an individual's ritual [101:5] while the <i>Ám Giành Tách</i> is a collective one; closely connected to the local cultural heritage and thus capable of providing a sense of warmth [103: 6] for one's emotional well-being.

Table 10.4: Summary of the result of the analysis for *Ám Giành Tách*

This result presents the different elements of sustainability associated with *Ám Giành Tách*. For instance, it highlights the use of natural, local, and recycled materials and a design that remains the same across generations. The techniques used in its construction promote the use of the rattan efficiently and also the means to repair and upgrade parts of the product. These productions techniques are part of the traditional knowledge. As a folkcraft product, the skills required to make this product are relatively easy to learn. Nevertheless, its quality is often depended on the target market. In terms of 'usage,' the product offers interesting user-product relations: a frugal, healthy, green, and traditional way of tea consumptions which is unique to the Vietnamese culture. This heritage product is also linked to the memories shared by local people, their collective identities, as well as practices. It is associated with the physical and emotional well-being of individuals. In general, tea drinking is considered a healthy practice and common in local celebrations and rituals and the *Ám Giành Tách* is part of the tangible aspects of Vietnam traditional tea experience.

Case Study 5: Liếp (Bamboo Mat)

Liếp, or the bamboo mat, is a versatile traditional household item as it can be transformed into different things for everyday needs. In Case Study 5, the *Liếp* (the bamboo mat) is used as the outer layer of a pressed bamboo sheets, which was defined as *Liếp cốt* (reinforced bamboo mat) during the session (see 6.3.6). A total of 52 statements were converted for the content analysis, and the result of the coding process and the pattern matching are presented in Table 10.5. The table presents a

summary of the connections between the parameter, elements of sustainability, a number of statements matched to the elements, and their descriptions.

Parameter (number of coded statements)	Element of Sustainability	No. of Statements	Descriptions
Material (4)	<i>Natural material</i> <i>Local material</i> <i>Recycled material</i>	4	Traditionally, the bamboo mat is made using a mixture of different types of bamboo [73:10]. However, they need to be sturdy and bendable [88:2]. ' <i>Luong</i> ' [72:9] and ' <i>Nua</i> ' [88:2] are typically used. To produce the pressed bamboo, the bamboo mats are layered with sheets of acacia bark [86:2] procured from furniture industry waste.
Design (8)	<i>Reliability and durability</i> <i>Component optimization</i> <i>Classic design</i>	7	This particular product is also considered as a classic design due to its natural outlook [77:6], handwoven characteristic [76:6], and the use of traditional patterns such as herringbone, and checkered patterns which are also cheapest to manufacture [75:6]. To optimize production processes, the company focuses on six different patterns only [72:6] and maintains the square format of weaving the mat [73:6]. In both forms (<i>Liép</i> and <i>Liép cọt</i>) the surface of the products influence their durability; a strong, sturdy, and smooth weaving surface [72:7] is essential as the surface also influences how the products aged with time [74:6].
Production (10)	<i>Production technique</i> <i>Production step</i>	9	Several production techniques, and process steps identified, specifically in the process of making the pressed bamboo sheet. The bamboo mats are produced according to three different standard sizes [72:8]. The process of transforming the mat into pressed sheets improves the material's characteristics, making it stronger, sturdier, and more durable [76:8]. However, the process also includes the use of formaldehyde [84:2] to glue the acacias barks and bamboo mats together [81:5]. There are different requirements for formaldehyde in different countries; the company has to be conscious of the use of this chemical in their products [85:2]. Insect repellent is also mixed in the glue as part

			of the treatment process to improve the product's durability [75:8]. Different types of finishes are also available: natural, stained, two-toned and carbonized [73:9], and lacquered [83:2]. In comparison to the pressed bamboo, the traditional bamboo mat is softer and perceived to be cheaper [77:8].
Usage (7)	<i>User-product relation</i> <i>Practical function</i> <i>Customizable</i>	6	The traditional mat has the smell of nature; a newly woven mat can be hard and coarse, but it will soften and smoothen with time [73:7]. The mat can be customized into various shapes: rolled into a cylinder, flat on the floor, stand vertically, often in combination with an external support system [76:7]. These different configurations contribute to the mat's multipurpose characteristic. For instance, as a ceiling, wall, fence for livestock, balcony [73:8], mat, rice storage [74:8], home ceiling [74:10] and scaffolding for cement in construction sites [79:8]. The pressed bamboo is stronger thus can be sat on [74:7]. Similar to the <i>Liép</i> , <i>Liép cõt</i> is also a versatile multipurpose material.
End-of-life (0)	-	-	-
Collective Knowledge (9)	<i>Local knowledge</i> <i>Traditional knowledge</i>	9	Bamboo is cut when it is still fresh and wet [82:3], the bamboo is split and weaved [74:9]. The inner part of the bamboo stem is used for indoor products while the bamboo skin is often used for outdoors [75:7], since the skin is hard, strong, and waterproof [87.2]. The mat is handwoven [76:9] to form a basic and simple product with various uses and potentials [77:10]. A whole bamboo stems can also be weaved by beating them flat before weaving to create a gigantic pattern. Traditionally, the mat is flattened to dry on top of the ceiling joist for one year before use [78.6]. This strengthens the bamboo before it is ready to be used [77:10].
Belief (3)	<i>Local memories</i>	3	
Practices (5)	<i>Family/ community</i> <i>Economic development</i> <i>Social</i>	5	Bamboo plants are planted as a fence and to protect villages during storms [82:4]. The plant is sturdy, firm, and rooted deep in the earth and it is also flexible [81:6]. These characteristics are also metaphorically linked to Vietnam and its

<i>manufacturing</i>	people. During the war, the bamboo mat was also used to construct blockhouses [75:10].
	In the old days, households would often have more than one <i>Liép</i> at home [76:10]. It is part of the traditional architecture and interior construction [72:10]. Currently, such aesthetic can be found mostly in hotels or spa interiors [77:7]. Nevertheless, this particular product is still being used in the countryside [78:8]. The production of the mat is now part of a social manufacturing system [77:9] which decentralized the manufacturing process and involves the local community as one of its stakeholders (see also 6.1.1).
Individual (0)	- - -

Table 10.5: Summary of the result of the analysis for Liép.

The result captures the development of the bamboo mat from a traditional household product into a material used to make pressed sheet bamboo that is used to make contemporary craft products. Similar to the tea warmer, this particular product is also matched with natural, local, and recycled material. However, the recycled material used in the pressed bamboo mat is not part of the traditional method. The bamboo mat is considered a classic design due to its physical characteristics, especially the surface that shows how the material aged over time. Currently, the size and the patterns of the mat are standardized to optimize productions.

The production process for the traditional mat is natural and slow. For example, the bamboo retains its natural finishing, and it is dried for a year before it is ready for use. This process is also part of the traditional and local knowledge. In comparison, the production process for the *Liép cõt* includes the use of formaldehyde and insect repellent in its construction. It also offers different surface finishes that influence the aesthetic of the mat and its strength and durability. The process of making the pressed bamboo is part of the social manufacturing system which includes a decentralized manufacturing process and involves the local community as one of its stakeholders (see also 6.1.1). The mat offers an interesting user-product relation allowing various design and functionality to the users. These characteristics can also be translated to the pressed bamboo sheets. The result also shows the intimate connection between the local people to a local material, highlighting their interactions in the past as well as in the present.

Case Study 3: Labu Sayong (Water Pitcher)

Labu Sayong is a traditional water pitcher made from locally excavated clay with a luster black glossy finish which is native to an area called *Sayong* in the north of Malaysia. Hence, this particular heritage product was a natural choice for Case Study 3 (see 6.3.4). A total of 36 statements were converted for the content analysis. The summary of the analysis is presented in the table below (10.6).

<i>Parameter (number of coded statements)</i>	<i>Element of Sustainability</i>	<i>No. of Statements</i>	<i>Descriptions</i>
Material (1)	<i>Natural material Local material</i>	1	The potteries from <i>Sayong</i> are made exclusively using locally excavated clay. To improve the clay properties, currently, sodium chloride (salt) is added to this raw material [3:10].
Design (7)	<i>Integration function Classic design</i>	5	The design language of this traditional water pitcher remains the same for generations; with stable and symmetry construction [2:10], creating balance and harmony [4:6]. Repetitive patterns [6:5] for the surface design are inspired by nature and local surroundings [5:6]. Apart from decorative purposes, the stamp impressed relief patterns of the surface design also improve the grip as it increases friction during use [1:8].
Production (3)	<i>Production technique</i>	3	Traditionally, the pinching technique was used to form the gourd; however, this technique has been replaced with a casting technique [4:9] which allows local producers to remain competitive in the market [10:3]. The black firing technique is used to create the black luster finish in which a formed gourd is baked in a kiln (or a pit fire) and then immediately put into a pile of rice husk [6:6].
Usage (4)	<i>Healthy consumables Energy consumption Practical function</i>	4	The shape of the gourd makes it easy to carry [4:7]. Due to the black firing technique, a certain amount of carbon content is embedded in this clay gourd thus potentially produce alkaline water [2:9] and neutralizing the water [4:8]. The evaporation through the porous pottery lowers the temperature of the water providing cool water on a hot tropical day.

End-of-life (0)	-	-	-
Collective Knowledge (6)	<i>Traditional knowledge</i>	6	The shape of the gourd can be defined based on a traditional Malay design principle which uses human anatomy (e.g., head, neck, body, and feet) to define different parts of a product [1:7]. The traditional baking procedure is rustic and, thus can be done by a household themselves [9:3]. For the traditional pinching technique; a plate (e.g. plates used for food) was used as a base to construct the gourd [1:10]. The construction starts in the middle of the pitcher and proceeds to the bottom. Then, it is turned upside down and completed from the middle to the top [5:8]. Once completed, the gourd's surface is smooth, but the inner part would be jagged with the maker's fingerprints [7:3]. The finished clay gourd is usually smoked (to pre-heat the clay) before baking [8:3].
Belief (11)	<i>Local memories Local identity Principle and philosophy</i>	11	Historically, the gourd was made from pumpkin [2:11] and traditionally made by women [1:11]. With a feminine flow [2:7], the gourd also represents nature and fertility [4:10]. <i>Labu Sayong</i> has deep and spiritual connections to the Malay community [3:11]. The old products are also associated with different spirits which were part of the local beliefs [11:2]. Drinking water from the pitcher is believed to be good for health [4:8]. Some of the gourds inherited from previous generations can be found in a local museum [5:9]. Designs of traditional Malay products often adopted principles in the form of local allegories [9:4]. For instance, ' <i>tajam tidak menikam</i> ' or ' <i>what is sharp should not be piercing</i> ' is a design principle used in the traditional objects [10:4]. This allegory has both an explicit and an implicit meaning. Explicitly, any shapes or lines with sharp edges should not be touching another shape or lines. Implicitly, it serves as a life principle that one should not stab another in the back. The gourd's covers are believed to be inspired by mosque's domes [6:7].

Practices (3)	<i>Community-oriented</i>	3	The product is part of folkcraft items [2:8], and it is still being used as a water pitcher by the local community [3:8]; however, most are produced for decorative purposes. The products also hold certain spiritual, cultural, and historical values to the local community thus it is being used as part of the state's royal processions and rituals [7:4].
Individual (1)	<i>Emotional well-being</i>	1	Traditional potteries are closely linked to instinct or a feeling of the craftsperson [8:4]; such a feeling influence their emotional well-being. In a way, the art of pottery making provides a meditating effect on the maker.

Table 10.6: Summary of the result of the analysis for *Labu Sayong*.

The results of the pattern matching suggest that this is a heritage product with layers of connections and interactions with the local community as well as the makers. This particular product is made exclusively from locally excavated material. There are variations of products available in the market; however, the core design style remains that same. Notably, with a balanced and symmetric construction and repetitive stamp impressed relief patterns. The impressed relief patterns also improve the user's grip during handling.

Traditionally, the gourd is made using the pinching technique; however, to remain competitive in the market, local producers changed their practice and adopted the casting technique instead. The black firing technique is still practiced as it provides the traditional black luster finish and is required if the gourd is to be used as a water pitcher. However, the use of this technique is decreasing due to the manual work required in the process and the market that is interested in the product for its decorative rather than its functional purposes. Nevertheless, the water pitcher is still in demand among the local community. The composition of water contained in this gourd is believed to be healthier as the clay improves the alkalinity and the carbon content embedded filter some contaminants from the water. Another well-known feature of the gourd is its capability to lower the water temperature providing cool water to drink in Malaysia's tropical climate. This heritage product is also connected to spiritual, cultural and historical values that are accepted among the common people as well as the royal families. The process of making pottery is also positively linked to the emotional well-being of the makers.

Case Study 6: *Atap Singgora* (Clay Roof Tiles)

These unglazed clay roof tiles are one of the features found in Malay traditional houses on the East coast of Malaysia and are also common within South East Asia region. The *Atap Singgora* workshop in Case Study 6 is the only remaining producer in the country (see 6.3.8). A total of 71 statements were converted for the content analysis. The summary of the analysis is presented in Table 10.7, and the detailed result can be found in Appendix 11.

Parameter (number of coded statements)	Element of Sustainability	No. of Statements	Descriptions
Material (3)	<i>Natural material</i> <i>Local material</i>	2	The raw clay is excavated from the nearby river and brought directly to the craft workshop [60:6]. As the clay properties have changed over the years, salt is currently added to the clay mix [69:2]. The mold used in its production is made of wood. Any type of wood can be used; however, the local wood, <i>cengal</i> , is the recommended option [50:9].
Design (11)	<i>Classic design</i>	6	This product is also considered as a classic due to its traditional aesthetic [48:6], being basic and true to the material [49:6], with natural earth tones [56:5] and that it creates repetitive pattern [57:5] based on a simple form [58:4]. A V-shaped tile [55:6] is a common shape found in Malaysia, and each tile set is customized to fit the batten size of a specific house or construction.
Production (17)	<i>Production technique</i> <i>Production step</i> <i>Production waste</i>	16	The process of making this product is quite crude [68:2]. The raw clay is cut using a tradition tool called ' <i>pohon bonsai</i> ' [48:9] which is a cutter that is made of a U-shaped wood with a wire going across [52:9]. The clay is cut to separate foreign objects, such as rocks and pieces of woods [54:9]. After use, the leftover clay is scraped on the workshop's pillar [53:9]. The clay is kneaded and shaped using the feet [49:9] and using their palm the clay is pressed at the edge to remove it from the mold [65:2].

To shape the tile, the mold is slanted on

			<p>the floor allowing the maker to step and slide their foot down across the mold [66:2]. Ash is scattered on the mold surface before the clay is put on the mold to reduce sticking [71:2]. The molded tiles are then arranged on the ground [64:2] and the edge of each tile is bent and dried under the sun [62:4]. Once dried, each tile is flattened with a wooden paddle [67:2] and then baked for three days [56:7]. The production process requires the workers to stand and bend in most processes [54:7]. The baked tiles are usually stacked in units of 10 [49:7] for transportation. The tiles are prone to breakage during transportation [51:7]; hence, there are a lot of rejects and waste [53:8].</p>
Usage (8)	<p><i>Practical function</i> <i>User-product relation</i> <i>Practical function</i> <i>Repair and</i> <i>Upgrade</i></p>	7	<p>This product is still produced for its practical function [54:8]: a roof tile [48:7]. The lines on the top of the roof can be locked using a U-shaped part that is positioned in the middle of the rooftop [49:8], or the top two tiles are interlocked [50:8]. The tiles are light and breathable; hence, capable of cooling a household in an intense tropical heat [58:5]. The tiles can be easily replaced [55:8] by sliding the new tile from the inside [60:5]. These clay tiles tend to get slightly moldy overtime [51:8]</p>
End-of-life (3)	<p><i>Product waste</i> <i>Disassembly</i> <i>Remanufacture</i> <i>and refurbish</i></p>	3	<p>The product is easy to assemble and disassemble [59:5] but also easy to break [52:8]. The broken tiles can be reused by grinding the pieces into powder and adding it back into the clay mixture [58:6].</p>
Collective Knowledge (8)	<p><i>Local knowledge</i> <i>Traditional knowledge</i> <i>Skills and technique</i></p>	8	<p>The shapes of the tiles are also linked to different regions [63:4]. For instance, tiles with a flat end—Cambodia [50:6], V-shaped—Malaysia and Thailand [51:6], U-shaped—Myanmar [52:5], flat with no hook—Vietnam [53:6]. These traditional roof tiles are waterproof and weatherproof [57:6]. Currently, as traditional houses are becoming scarce, the construction of these tiles needs to be performed or overseen by those specialized in traditional architecture and construction [56:6]. An old method</p>

			to repair the wooden mold: dry clay is mixed with water and then smoothened over the crack [57:7].
Belief (12)	<i>Local identity</i> <i>Local memories</i>	11	This product is one of the main features of Malay traditional houses on the East Coast [49:10], and it is also used in royal palaces [54:10, 55:10]. The traditional house does not have a ceiling; therefore, the patterns of the tiles can be seen from inside the house as well [55:7]. Producing the clay roof tiles was once the main source of income for the village [56:8]. They are known for their durability [50:10] in comparison to the other traditional option, the palm leaves [48:10]. In the old days, the thinner tiles are preferred as these were considered to be aesthetically pleasing [62:3]. The name <i>Atap Singgora</i> was revitalized by a local architect who was involved in the preservation of traditional architecture [51:10]. The word <i>Singgora</i> originated from Thailand [52:10]. Younger generations are not very interested in its production and use [52:7].
Practices (4)	<i>Community</i> <i>Cottage industry</i>	4	The craft workshop is the only traditional clay roof producer in the country [53:10]. It is part of the local cottage industry and intimately connected to the community. The workshop is situated in the middle of the village. The work is manual and labor intensive [51:9] and is sustained by the cooperation among the villagers [50:7]. The craftspeople working in the workshop are mainly women [53:7].
Individual (1)	<i>Physical well-being</i>	1	The production process requires a lot of repetitive movements with the feet, for example, to knead and shape the clay [61:4] which is unique compared to other craft that often required more intricate labor.

Table 10.7: Summary of result of the analysis for *Atap Singgora*.

The result presents a heritage product that still retains its practical function as well as the traditional method of construction. However, these factors also contribute to its current challenges to stay relevant and to sustain the business. The craft workshop being the only producer in the country is still intimately connected to the local community and also part of the local cottage industry. Similar to the water pitcher, this

product is also made of locally sourced clay. With a design that has not changed for generations, these clay roof tiles add a scale-like pattern to the traditional houses that are often made of dark wooden structures with elaborate carvings. The craft workshop retains the traditional way of making these tiles. Although the craft skill can be perceived as crude, it does require different repetitive movements of the feet that are unique compared to other crafts which often include intricate handiworks. This method has been practiced in the workshop for at least four generations. The tradition of making the clay roof tile is closely connected to the community's identity while the clay roof itself is part of the regional cultural heritage; hence, they are associated with local memories and cultural histories.

About the Author

Sarah Suib was born in 1984 in Perak, Malaysia. After completing her Bachelor's degree in Industrial Design from University of Technology Malaysia, she started working as a product designer for a consultancy agency. As the projects differed, she discovered that one of the best ways to quickly learn about something was through meetings with the experts: the suppliers. Next, she worked with a playground manufacturer as an industrial designer and later as R&D executive. This role was challenging, engaging, and stimulating as she had to explore new materials, trends, and technologies, learn about existing supply chain, and identify new target markets while taking into consideration the cost and profits to the company. It required knowledge and expertise, for instance in conducting research, forecasting future trends and developing business models among many others. From this experience, she discovered her passion for strategic design. Next, she was offered a position as a tutor at her alma mater and then continued to pursue a Master of Strategic Product Design in Delft University of Technology. She was one of the recipients of Industrial Design & Engineering (IDE) scholarship.

Her Master graduation project entitled *“Heritage Product for Future Living: Strategic Approach towards Sustainable Products in Vietnam”* led to the initiation of her PhD research. With a doctoral grant received from the Ministry of Higher Education Malaysia, she joined the Design for Sustainability program and embarked on a journey of exploring the gap between design, sustainability, and cultural heritage via values of heritage products. She is passionate and enthusiastic to explore the meaningful interactions between people, the artificial environment, and the natural environment and looking forward to continue working on various design challenges, collaborating with people from diverse background, and finding solutions for our complex everyday problems.

List of publications, conferences, and research activities

- Suib, S. S., Van Engelen, J., & Crul, M. R. M. (2016). Enhancing knowledge exchange and collaboration between craftspeople and designers using the concept of boundary objects. *International Journal of Design*, (Manuscript accepted for 2nd round of review).
- Suib, S. S. (2015). Values within Heritage Products: Integrating Heritage Values in the New Product Development Process. In *11th International Conference on Environmental, Cultural, Economic, and Social Sustainability*. Copenhagen, Denmark.
- Jin, S., Suib, S., Crul, M., & Brezet, H. (2014). Product Innovation in Vietnam: A strategic approach. In *Global Research Forum on Sustainable Production and Consumption (GRF-SPaC)*. Shanghai, China.
- Nik Ahmad Ariff, N. S., Badke-Schaub, P., Eris, O., & Suib, S. S. (2012). A framework for reaching common understanding during sketching in design teams. *Proceedings of International Design Conference, DESIGN, DS 70*, 1525–1533.
- Suib, S. S. S. (2012). Strategic Approach Towards Sustainable Heritage Products In Vietnam. *MSc Graduation Report, TU Delft Repository*.
- Poster presentation (2013). Heritage Inspired Innovation. *North Sea Commission (NSC): Joint conference on Craftsmanship and Future Perspectives*. Groningen, The Netherlands
- Workshop and Presentation (2014). Exploring Heritage Values and Building Narratives as Marketing Strategy for *REGIOCRAFTS*, Thessaloniki Greece.
- Contributors to “*Design in the Age of the Artificial Intelligence*” symposium, TU Delft, 2018.
- Reviewer for Journal of Environment, Development, and Sustainability (ENVI), 2018.

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PROPOSITIONS
Accompanying the thesis

THE INTANGIBLES

Values of Heritage Products for Design and Sustainability Initiatives

by Sarah Suib

1. A heritage product as an object of inquiry can act as a catalyst for discourse that brings the craft and the design domains together (this thesis).
2. Values of heritage products can be perceived as resulting from satisfactory interactions that have been repeated and sustained over time and across generations (this thesis).
3. The adaptation of culture-oriented content in the design process should be elevated from being perceived merely as a source of inspiration towards a source of reference (this thesis).
4. Sustainability is a composition of continuous efforts of creating flourishing interactions between people, nature, and the artificial (this thesis).
5. Cultural heritage and sustainability are both research areas that are invested in safeguarding and sustaining intergenerational equity for the future (this thesis).
6. When viewed correctly, complexity is only a mask for simplicity; the challenge is “to find pattern hidden in apparent chaos” (Simon, 1996, p. 1).
7. The creation of a single object comes from a huge number of fragments and chaos (inspired by Hayao Miyazaki).
8. Being lost is a state of scouting for a new territory.
9. The rhythm of music can also be experienced through breathing (discovered from a conversation with Sifu Siow, a lion dance master in Selangor)
10. Crafting can be a form of meditation.

These propositions are regarded as opposable and defensible, and have been approved as such by the promotor Professor dr. ir. J.M.L Van Engelen, and promotor Professor dr. ir. J.C Brezet.



Values are attributed to products over time and across generations. They are created, compiled, shared, evolved, exchanged, and also discarded. However, creating an explicit theory and analysis on this subject is challenging due to the abstract and multifaceted nature of the topic with a plethora of theories from various research communities. To manage this complexity, this research focuses on the concept of values in association with heritage products: products that are inherited from the previous generation, in material and immaterial forms. The exploration entails identifying values of heritage products and their potential applications in design and sustainability initiatives.

This research has been divided into two parts. Part 1 focuses on understanding and identifying the values of heritage products and Part 2 presents the adaptation of values of heritage products as a creative resource in design and sustainability initiatives. This exploration is framed against the backdrop of the cultural economy which connects the craft and design domains, includes the discourse of the intangible cultural heritage, and brings forward the craft industry as the empirical context.