

Research Plan

Jinwei Yang

5520347

AR3A010

Tutors:

Lidwine Spoormans

Lidy Meijers

Carola Hein

Rachel Lee

Skin

20th Century Shopping Mall

Redesign



Content

1. Introduction	1
Definition	
Skin in heritage Architecture	
Skin of 20th Century Malls	
2. Problem statement	2
3. Research question	4
4. Theoretical Framework & Contribution	5
Theoretical Framework.	
Building industry contribution	
Cultural contribution	
Social contribution	
Ecological contribution	
5. Methodology	7
Research Design	
Case Study	
Data Collect	
Data Analysis	
Research by Design	
Ethical considerations	
6. Research Plan for the Graduation Year	11
7. Reference & Figure List	12

1. Introduction

Definition

The building skin is the enclosure or envelope covering the building mass and forming the building elevation or façade.^[1] As a transition between inside and outside, its primary functions are to provide protection and privacy. When people began decorating their building skin as they did their clothing, it became more aesthetically and culturally valuable.^[2] As a result, designing a building enclosure became the integration of the science of physics and the art of decoration.

In an urban context, the skin is the transition between the building and the urban space. According to Sack, 'A façade belongs to everybody; only what's behind it is the business of those who have to live with it.'^[3] Façades, which form streets and squares in the city, give buildings' exteriors a special meaning that extends far beyond a building's impact on its surroundings.

Skin in heritage Architecture

In the realm of heritage architecture, Steward Brand described the skin as being mutable

and most buildings cannot resist periodically shedding old skin for a new one.^[4] This is very true since it is the layer that is most exposed to the weather and susceptible to a variety of encroachments. For most conservation projects, upgrading a building's enclosure is crucial.

For those nationally listed heritage buildings, there are usually regulations that prevent the alteration of character-defining features. The major design concern is the conflict between new building requirements and the preservation of cultural and historical values.^[5](Fig. 1) Façadomy (Fig. 2), in which only the façade of a building is preserved and new buildings are erected behind or around it, is an extreme method used by some developers to avoid these conflicts.^[6]

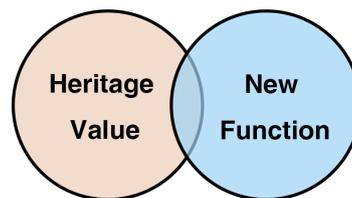


Fig. 1 Significant heritage buildings' skin redesign conflict



Fig. 2 Example of Façadomy Caledonian Road, London

[1] Wong, W.S., *Building Enclosure in Hong Kong: Environmental Considerations*. Vol. 1. 1998: Hong Kong University Press, P.1.

[2] Schittich, C., W. Lang, and R. Krippner, *Building Skins*. 2006: Birkhäuser. P.9-10.

[3] Sack, M., *Verlockungen der Architektur: kritische Beobachtungen und Bemerkungen über Häuser und Städte, Plätze und Gärten*. 2003: Quart Verlag, P56.

[4] Brand, S., *How buildings learn: What happens after they're built*, 1995: Penguin, P.19.

[5] Orbaşlı, A., 2017. Conservation theory in the twenty-first century: slow evolution or a paradigm shift. *Journal of Architectural Conservation*, 23(3), P.165.

[6] Kyriazi, E.J.A.I., Façadism, building renovation and the boundaries of authenticity. 2019. 2(2): P. 185-187.

Skin of 20th Century Malls

But for shopping malls, as products of consumerism, skin redesign is also about establishing a new identity through a change of appearance.(Fig. 3) On the one hand, most malls do not hold the same heritage significance as those protected by law. Renovation can then be carried out with more freedom. On the other hand, their consumerist nature urges them to pursue new, modern, fashion-forward designs to keep their customers interested.^[7]

As Venturi stated in the book *Learning from Las Vegas*, the big signs(façades) in commercial landscapes have more symbolic value than the architecture itself.^[8] Especially in today's information age, people tend to judge a building mostly based on pictures they see on their mobile devices before visiting it. Therefore, an attractive and unique appearance would generate high post rates on the Internet, arouse people's interest to go inside, and eventually lead to the success of a mall.

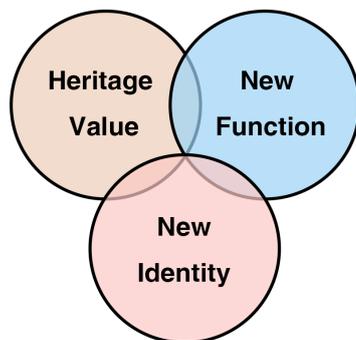


Fig. 3 Mall skin redesign conflict

2. Problem statement

In recent years, the skin has become increasingly important in the areas of research and development. It is due to the evolution of building envelope technology, as well as public awareness of environmentally sustainable living. In many projects today, external skin becomes a multi-layered system (whose surfaces rarely give us any insight into the interior life of the building).^[9]

Academically, many construction-oriented books study the building envelope independently. For example, the book *Façades: principles of construction* explains different façade types like second-skin façade, box-window façade, corridor façade, shaft-box façade, etc.^[10] While *Façade Construction Manual* offers extensive information about façade materials, thermal comfort, and ventilation.^[11] The renovation of modern glazed façades is analyzed in *Reglazing Modernism*.^[12] But theories related to heritage value assessment and interventions still consider the skin as an integral part of the building. The lack of attention to skin redesign in heritage architecture can result in the loss of many values in renovation process.

In practice, there is neither a design method for 20th-century mall façades nor a detailed analysis of the finished projects. We do notice that there are general differences in strategies

[7] Stearns, P.N., 1997. Stages of consumerism: recent work on the issues of periodization. *The Journal of Modern History*, 69(1), P.105.

[8] Brown, S. and I. Venturi, *Learning from Las Vegas*. 1972: Art, Architecture and Engineering Library, P.19.

[9] Bergeman, B.C., *A cellular approach: understanding architecture via biochemical pathways*. 2005, P.51.

[10] Knaack, U., et al., *Façades: principles of construction*. 2014: Birkhäuser.

[11] Herzog, T., R. Krippner, and W. Lang, *Façade construction manual*. 2012: Walter de Gruyter.

[12] Ayón A, Pottgiesser U & Richards N, *Reglazing Modernism*, Vol. 1. 2019, Birkhauser Verlag GmbH, Basel.

between different cases. Westfield Mall, for instance, has completely transformed its appearance after several renovations, becoming one of the country's most fashionable malls. (Fig. 4, Fig. 5) Others, such as Lijnbaan, showed more respect for the past by avoiding major alterations.(Fig. 6, Fig. 7)



Fig. 4 The Westfield Mall in 1984



Fig. 5 The Westfield Mall in 2022



Fig. 6 Lijnbaan in 1960



Fig. 7 Lijnbaan in 2022

But when we zoom in on different parts of the skin design, we can see that a variety of interventions have been conducted, some of which even do not align with the building's overall strategy.(Fig. 9) Even in the Westfield Mall, it is still possible to see some parts of the skin remain a connection to the past.(Fig. 8) Lijnbaan also had opposite exterior design methods by different architects. For example, Mei Architects restored the wooden canopy, emphasizing the original design intent.(Fig. 10) Whereas, WDJArchitecten added new features by constructing a large concrete frame outside the old structure to unify the façade of different shops.(Fig. 11)



Foto Haags Gemeentearchief



Signe Ganz

Fig. 8 The skylight in the Westfield mall remains the same

As a result, there is a need to develop a systematic way to categorize and analyze these different skin interventions that have occurred on different projects, as well as on the same project but on different façades.

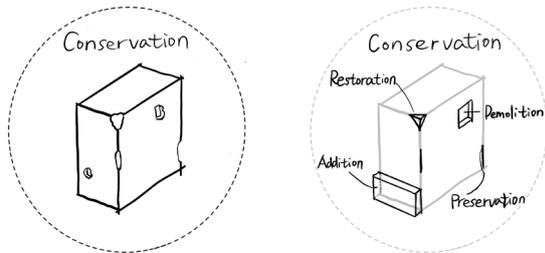


Fig. 9 Diagram showing different skin interventions happening under the same principle



Fig. 10 The reconstructed wooden canopy in Lijnbaan



Fig. 11 The concrete frame added to Lijnbaan

3. Research question

How can the preservation of heritage values, fulfillment of functionality and establishment of identity be balanced in the skin redesign of 20th-century shopping malls in the Netherlands?

Sub questions

What aspects are included in the value assessment of the skin?

What is the relation between skin elements and the identity of a mall?

What are the main intervention strategies used to upgrade shopping mall enclosures?

In the contemporary redesign of malls, what functions should the skin serve? And What are their relationships with different stakeholder interests?

4. Theoretical Framework & Contribution

Theoretical Framework.

The research will be conducted in the field of heritage architecture, focusing on the skin layer, one of the six timescale shearing layers described by Steward Brand in *How buildings learn*.^[13](Fig. 12) Although skin can never be the only influential factor in any conservation project, the purpose of this research is to detail some existing theories from its perspective.

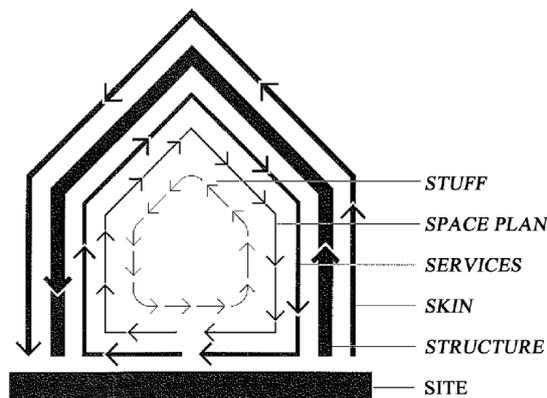


Fig. 12 The six timescale shearing layers

First, the heritage value assessment system developed by Kuipers in the book *Designing from heritage* will be used as a basis.^[14](Fig. 13) I will subdivide the skin into categories like windows, entrances, roofs, materials, colors, patterns, and signs for further analysis. Furthermore, the system will be more skin-specific by using some of the values classified by Roders in 2007, such as economics, ecology, and aesthetics.(Fig. 14) A preliminary version of the new system is shown in Fig. 15.

[13] Brand, S., *How buildings learn: What happens after they're built*. 1995: Penguin, P.13.

[14] Kuipers, M. and W.J.D.T.D. De Jonge, *Designing from heritage*, 2017: P.87.

BRAND +	RIEGL +	AGE value	HISTORICAL value	INTENTIONAL COMMEMORATIVE value	NON INTENDED COMMEMORATIVE value	USE value	NEW-NESS value	(relative) ART value	RARITY value (+)	OTHER relevant values (+)
SURROUNDINGS / SETTING (+)										
SITE										
SKIN (exterior)										
STRUCTURE										
SPACE PLAN										
SURFACES (interior) (+)										
SERVICES										
STUFF										
SPIRIT of PLACE (+)										

Fig. 13 the heritage value assessment system developed by Kuipers



Fig. 14 The 8 inherent values in heritage classified by Pereira Roders, 2007

BRAND +	RIEGL +	AGE value	HISTORICAL value	INTENTIONAL COMMEMORATIVE value	NON INTENDED COMMEMORATIVE value	ECOLOGICAL Value	ECONOMIC Value	AESTHETICAL Value	POLITICAL Value	OTHER relevant values (+)
WINDOWS										
ENTRANCE										
ROOFS										
MATERIALS										
COLORS										
PATTERNS										
SIGNS										

Fig. 15 a preliminary version of the new system.

INTERVENTION CATEGORIES

I. Restoration

1. Frame repair and single-pane glass
2. Frame repair and single-pane laminated glass

II. Rehabilitation

1. Frame repair and insulating glass units (IGU)
2. Frame repair and single-pane glass plus secondary glazing
3. Frame repair with structural reinforcement and single-pane glass

III. Replacement

1. Non-thermally broken steel frames and single-pane glass
2. Non-thermally broken steel frames and insulated glass units (IGU)
3. Thermally broken steel frames and insulated glass units (IGU)
4. Thermally broken aluminum frames and insulated glass units (IGU)

Fig. 16 The Reglazing Modernism intervention classification

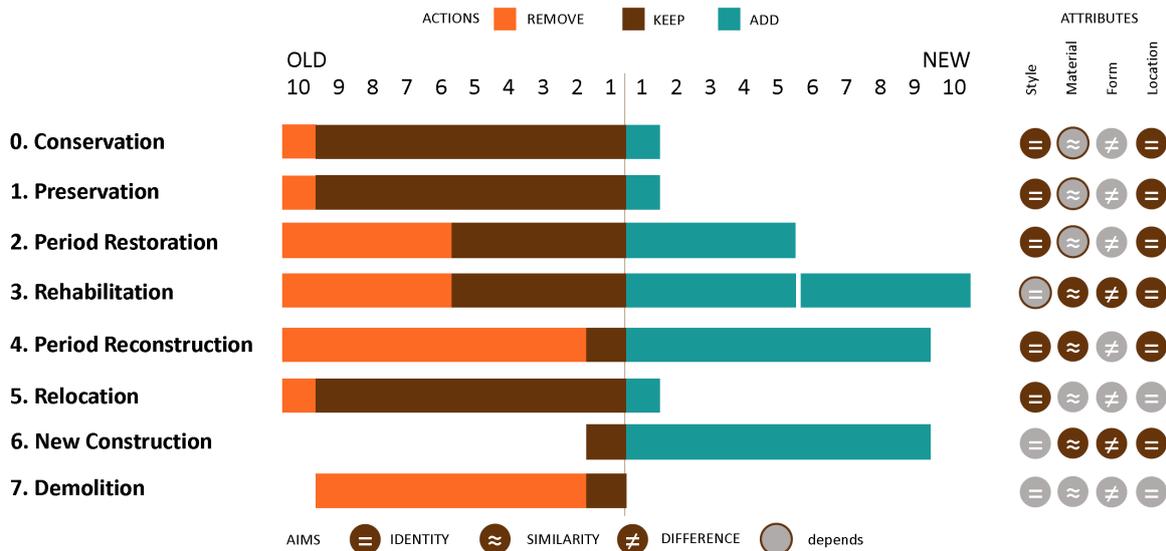


Fig. 17 Roders' classification of seven interventions, diagram made by Lin M, 2022

Reglazing Modernism classifies skin interventions into Restoration, Rehabilitation, and Replacement.^[15](Fig. 16) I will also expand this category using Pereira Roders' classification of seven interventions in *Re-architecture: lifespan rehabilitation of built heritage*.^[16](- Fig. 17) Therefore, it can cover the many interventions we found on the mall skin. Peter Howard's stakeholder classification^[17] will be used to connect interests with different groups of people. Fig. 20 illustrates how these theories will be applied in the case study.

Building industry contribution

Today, renovation projects are becoming increasingly significant in the building industry, making up 70-80% of the European market.^[18] Although this research focuses primarily on 20th-century Dutch malls, it can easily be applied to many other heritage buildings. And in practice, it can help many post-war façades meet contemporary requirements while having a well-thought-out appearance.

Cultural contribution

Using the skin evaluation system, people will

[15] Ayón A, Pottgiesser U & Richards N, *Reglazing Modernism*, Vol. 1. 2019, Birkhauser Verlag GmbH, Basel, P. 33.

[16] Pereira-Rodgers, A., J. Post, and P. Erkelens. *Re-Architecture: lifespan rehabilitation of built heritage*, 2007.

[17] Howard P, *Heritage: management, interpretation, identity*, Continuum, London, 2003.

[18] Ayón A, Pottgiesser U & Richards N, *Reglazing Modernism*, Vol. 1. 2019, Birkhauser Verlag GmbH, Basel, P. 22.

be able to understand more about a façade's cultural value and original design intent, especially those that haven't been considered significant heritage buildings. Therefore, improvements can be made without sacrificing those key aspects. While the study examined cases in the Netherlands, the methods are applicable to other countries with consideration of local conditions such as climates, cultures, and users.

Social contribution

By examining how heritage buildings should be presented to cities, the government, technical experts, and designers can make choices that will support sustainable urban development. Keeping the essence of the past while moving forward is what makes a city rich in culture and vibrant in life. The research not only respects people's memories of the old building but also searches for ways to form new identities for buildings and cities.

Ecological contribution

The energy crisis and climate change we are experiencing are both real and urgent threats. As a result of low thermal performance in many heritage buildings, skin upgrades can significantly reduce energy waste. This study will combine heritage assessments and energy-saving building design. During the redesign, factors such as envelope insulation, window size, glazing and shading, and ventilation will be considered.

5. Methodology

Research Design

The purpose of this research is to establish an appropriate method for evaluating heritage building enclosures and choosing appropriate interventions in the redesign process. It is based on the Interpretivism paradigm and mainly applies inductive research approaches. A combination of qualitative and quantitative research will be used to assess the skin heritage values, while qualitative research will be used to determine the building's identity. It should be noted that though the author attempted to be objective, the evaluations and classifications included in this research still partly represent the author's subjective opinions.

Case Study

The first step in this research was reading heritage architecture books and visiting 20th-century malls in the Netherlands. With the shared information within the class, we have a wide range of mall cases and theories that can be used for individual research. After careful consideration, my research case will be Hoog Catharijne in Utrecht.

First of all, it was one of the largest malls built in the Dutch historical city center. Because of this, its skin design faces an even greater conflict between fitting into its surroundings and showing off its identity. Additionally, the renovation involved a variety of interventions such as demolition, addition, preservation, and rehabilitation. By studying this building alone, we can have a clear idea about why architects applied different strategies for each façade. Lastly, there have been many controversies since this project was announced. The conflict



Fig. 18 Current selected facades to conduct the research (photos taken in 2022)

between different groups can easily reveal how they got involved in the project and what interests them. Other cases, such as Lijnbaan and Westfield, will only provide some complementary information.

Data Collect

The Utrecht Archive, which contains sufficient old photographs, newspapers, and design drawings pertaining to the project, will be a major primary source of historical information. Field trips and photos taken by the author will be another primary source to illustrate the present condition of the mall. Due to the importance of the project, there are many publications, academic articles, and project documentation about it. These will serve as secondary sources to gather information regarding the renovation process. Social media monitoring will be a major method to collect people's opinions on the renovation result. On Internet forums and social media accounts, I will collect 100 photos and 100 comments about Hoog Catharijne based on a simple random sample strategy.

Data Analysis

The research will focus on four representative facades of the Hoog Catharijne. (Fig. 18) Based on the historical pictures I collected in the archive, I will take a series of photos from similar perspectives. This allows us to identify which parts of the skin have been modified and categorize the intervention strategies. Through reading the decision-making process, we can further link the interventions to various stakeholder interests. As a next step, the evaluation system developed in this study would be employed to create 'value mappings' for the facades. Using value mappings at different times, we can clearly see which values had been maintained, which values had been lost, and what new values had been established after interventions.

In addition to the appearance analysis, the research will also look at the detailed drawings of the facade. Similarly, by comparing old and new drawings, we can determine what functions were added through the redesign. Apart from this, comparisons between facades at different parts of the building will show how the project reacts to energy-conscious design

in different contexts (e.g. different orientations could influence the use of materials).

The comments I collected on the Internet will be categorized as positive and negative to provide an overview of people's opinions. Photos shared on social media can provide a good indicator of how people perceive the building. The number of times people post about a certain façade or specific façade elements can, to large extent, reflect the identity of the building. I will calculate these frequencies based on the photos I collect and make a table to show the results.

In the end, we can conclude how the project responds to heritage values, functional needs, and identity establishment. The whole analysis procedure is shown in Fig. 20.

Research by Design

A crucial aspect of this research is that it will be tested later by the author through a design project. This design will not only apply the findings from the research but also reinforce the research itself. As an example to answer the research question, the selected design case, a 20th-century mall in the Netherlands, will be designed from the outside in. Using scenario development, the design will choose appropriate interventions for every façade with the consideration of program, structure, and detail. During the final design stage, the original building façade and the design will be re-evaluated. It ensures that skin value and design intention are not lost in coordinating other building layers. Sketching, mapping, and making essence models will be effective ways of studying the mall. These design methods will enhance our understanding of

research and design cases, as well as showing personal interpretations.

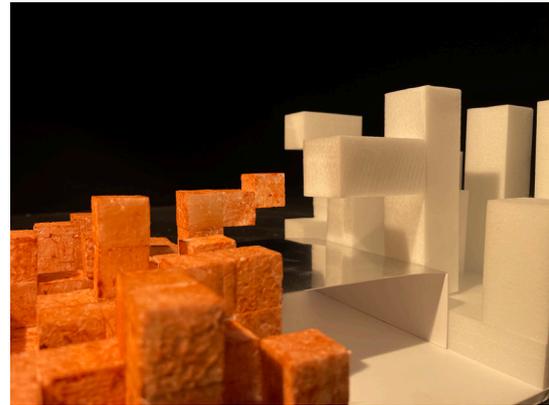


Fig. 19 A model to demonstrate Hoog Catharijne's linkage function

Ethical considerations

Throughout the research process, the researcher will adhere to the ethical considerations developed by the European Research Council^[19]. There will be no false or misleading information, nor will any primary data findings be presented in a biased manner. Analyzing different cases and strategies will maintain the highest level of objectivity and avoid any judgment toward the architects or offices.

A high level of confidentiality will be maintained when handling the data. Information such as project budgets, which may result in conflicts of interest, will not be presented. Online participants are guaranteed no harm in any way for taking part in this study, and their privacy is protected. All information retrieved from social media will be anonymized by removing account IDs, personal photos, and any other information not relevant to the study.

[19] Oliveira F, Ethics Review in SS&H Procedures in Horizon 2020, The European Research Council.

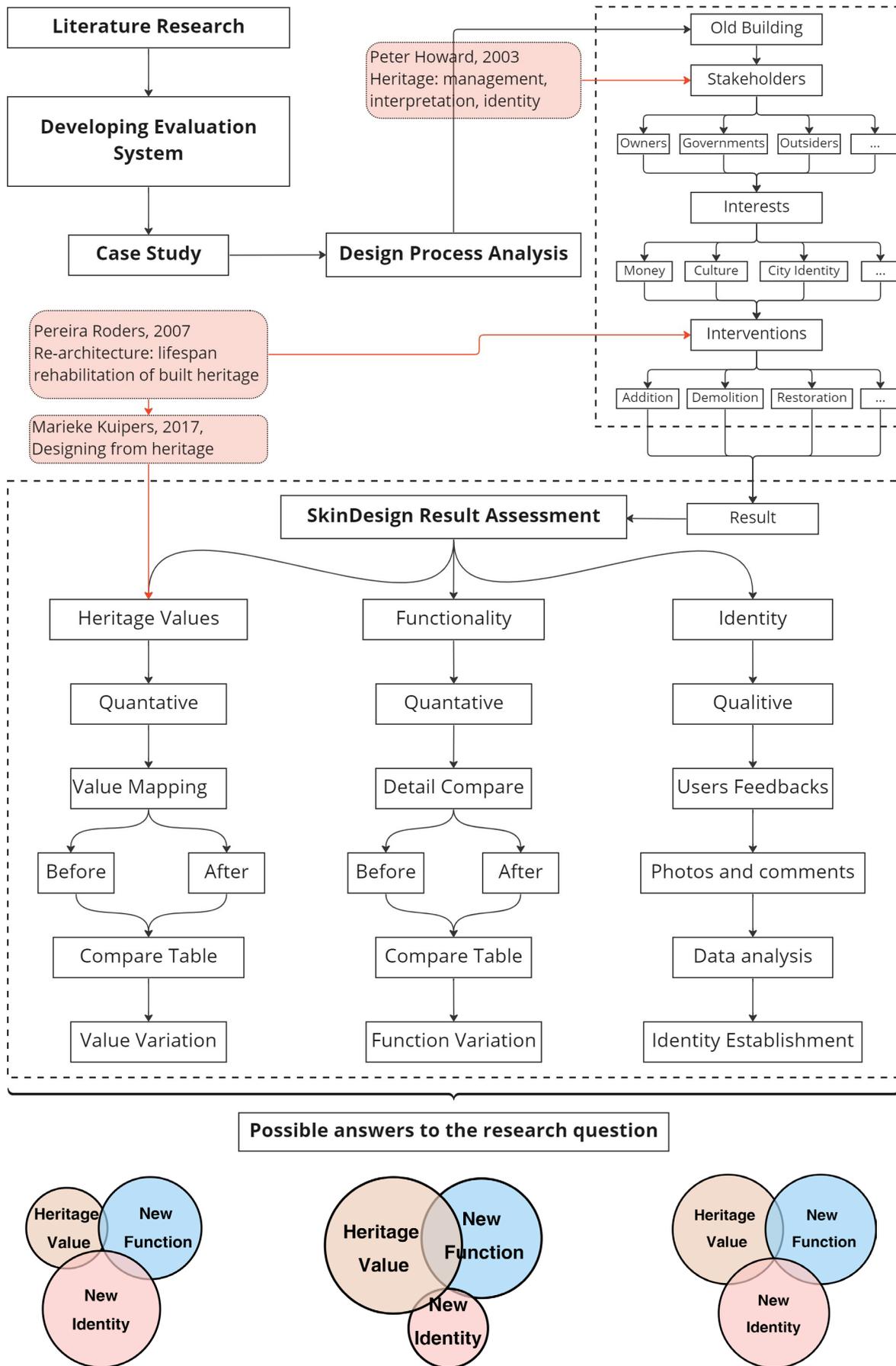


Fig. 20 A diagram of the methodology and theories used in the study

6. Research Plan for the Graduation Year

Research Plan		Important Stages	Steps to follow	Specific methods
	Group Research	Individual Research	Design Project	
	Research Topic 20th Century Shopping Malls in the Netherlands.	Research Question How can the preservation of cultural continuity, fulfillment of functionality and establishment of identity be balanced in the skin redesign of 20th century shopping malls in the Netherlands?	Transformation of a 20th century mall Start the design project from the skin layer and coordinate other building aspects with the skin.	
Q1 2022.9.5 - 2022.11.13	Reading existing heritage theories	Focusing mainly on the skin layer	Gathering ideas of the essence of the mall	
	Sharing the information by making summary videos.	Study the skin upgrade in a series of case studies	Using model to show the essence of a 20th century mall	
Q2 2022.11.14 - 2023.2.5	Doing research for the selected cases	Choosing Hoog Cathrijne as the main research case	Making the essence model of the chosen case study	
	Shopping malls visit	Sub Question How to design a method specific for the value assessment of building skins?	Choosing a design case and applying the research findings	
	Making group presentation and booklet to collect the information. (General information, Historical context, Accessibility, Urban plan, Theme, Ownership, Identity, Users, Documentation of interventions, Grain size of the shops in the mall)	Analyze and summarize existing theories and develop a new system	Assessing the heritage value of the case	
	Discussing the value assessment for the shopping malls	Sub Question What functions should the skin serve in the redesign of malls? (different stakeholder interests)	Assessing the value of the whole building using existing system	
Q3 2023.2.6 - 2023.4.23	Analyzing the essence of a 20th century shopping mall	Using the perspective of the skin to analyze the decision-making process of Hoog Cathrijne project. (add more cases, if not enough)	Specifically for the skin using the system developed in the research	
	Further research on the design cases with people who shared the same interests.	A comparison of the façade detail drawings at different times and different parts of the building	Making an essence model of the skin for the design case	
	Working on scenario development	Research in the literature, old newspapers, videos and archives	Create different scenarios for the design case	
Q4 2023.4.24 - 2023.7.2		Sub Question How to establish a new identity for the malls while at the same time keeping the original values in the skin redesign?	Test of Design	
		Analyze what value has been kept and what has been lost	Start from the appearance design of the building	
		Comparing old photos and documenting the changes in detail in the skin and surroundings of the case study	Design the skin to preserve the cultural value	
	Creating façade value maps for the skin at different times	Checking the Internet for people's opinions about the case study's appearances at different times.	Design the skin to establish a new identity for the old mall	
	Reviewing comments about the case study in videos and forums	Collecting photos from social media and the mall's official website to see how people make photos of the mall's appearance	Design the facade detail to meet sustainability requirements	
	Conclusion A conclusion of the essentials of skin redesign for shopping malls and identifying strategies that will best balance cultural values, functionality, and identity.	Reflection and feedback	Assigning the program for the building	
			Design the floor plans and sections	
			Elaborate the overall design and adjust different parts of the building	
			Reflection and feedback	

7. Reference & Figure List

Ayón A, Pottgiesser U & Richards N, *Reglazing Modernism*, Vol. 1. 2019, Birkhauser Verlag GmbH, Basel, P. 22.

Brand, S., *How buildings learn: What happens after they're built*, 1995: Penguin, P.19.

Bergeman, B.C., A cellular approach: understanding architecture via biochemical pathways. 2005, P.51.

Brown, S. and I. Venturi, *Learning from Las Vegas*. 1972: Art, Architecture and Engineering Library, P.13, P.19.

Herzog, T., R. Krippner, and W. Lang, *Façade construction manual*. 2012: Walter de Gruyter.

Howard P, *Heritage: management, interpretation, identity*, Continuum, London, 2003.

Knaack, U., et al., *Façades: principles of construction*, 2014: Birkhäuser.

Kuipers, M. and W.J.D.T.D. De Jonge, *Designing from heritage*. 2017: P.87.

Kyriazi, E.J.A.I., *Façadism, building renovation and the boundaries of authenticity*. 2019. 2(2): P. 185-187.

Oliveira F, *Ethics Review in SS&H Procedures in Horizon 2020*, The European Research Council.

Orbaşlı, A., 2017. Conservation theory in the twenty-first century: slow evolution or a paradigm shift. *Journal of Architectural Conservation*, 23(3), P.165.

Pereira-Rodgers, A., J. Post, and P. Erkelens. *Re-Architecture: lifespan rehabilitation of built heritage*, 2007.

Sack, M., *Verlockungen der Architektur: kritische Beobachtungen und Bemerkungen über Häuser und Städte, Plätze und Gärten*. 2003: Quart Verlag, P56.

Schittich, C., W. Lang, and R. Krippner, *Building Skins*. 2006: Birkhäuser. P.9-10.

Stearns, P.N., 1997. Stages of consumerism: recent work on the issues of periodization. *The Journal of Modern History*, 69(1), P.105.

Wong, W.S., *Building Enclosure in Hong Kong: Environmental Considerations*. Vol. 1. 1998: Hong Kong University Press, P.1.

Cover Page 0

Left: Historical photos of Utrecht, accessed 18 October 2022, Utrecht Archive.

Right: Shopping mall interior, digital image, accessed 4 October 2022, <<https://libreshot.com/inside-shopping-mall/>>.

Fig. 1 Significant heritage buildings' skin redesign conflict 1

Drawing by author, 3 November 2022

Fig. 2 Example of Facadomy Caledonian Road, London 1

Digital image, accessed 15 October 2022, <<https://www.bbc.com/news/in-pictures-50396337>>.

Fig. 3 Mall skin redesign conflict 2

Drawing by author, 3 November 2022

Fig. 4 The Westfield Mall in 1984 3

Digital image, accessed 17 October 2022, <<https://indebuurt.nl/denhaag/toen-in/fotoserie-zo-zag-winkelcentrum-leidsenhage-ervroeger-uit-144973/4/>>.

Fig. 5 The Westfield Mall in 2022 3

Digital image, accessed 15 October 2022, <<https://www.omroep-west.nl/nieuws/4469921/omwonendenmall-of-the-netherlands-zitten-nog-jaren-in-de-verkeersellende>>.

Fig. 6 Lijnbaan in 1960 3

Digital image, accessed 16 October 2022, <<https://wederopbouwrotterdam.nl/en/articles/lijnbaan-shopping-precinct>>.

Fig. 7 Lijnbaan in 2022 3

Digital image, accessed 18 October 2022, <<https://mei-arch.eu/projecten/de-lijnbaan/>>.

Fig. 8 The skylight in the Westfield mall remains the same 3

Top: Photo by Haags Gemeentearchief, 1990.

Bottom: Photo by Signe Ganz, 2022.

Fig. 9 Diagram showing different skin interventions happening under the same principle 4

Drawing by author, 4 November 2022

Fig. 10 The reconstructed wooden canopy in Lijnbaan 4

Digital image, accessed 18 October 2022, <<https://mei-arch.eu/projecten/de-lijnbaan/>>.

Fig. 11 The concrete frame added to Lijnbaan 4

Digital image, accessed 17 October 2022, <<https://www.wdjarchitecten.nl/projecten/winkels-horeca-h-h-de-klerk/>>.

Fig. 12 The six timescale shearing layers 5

Brand, S., *How buildings learn: What happens after they're built*, 1995: Penguin, P.13.

Fig. 13 the heritage value assessment system by Kuipers 5

Kuipers, M. and W.J.D.T.D. De Jonge, *Designing from heritage*. 2017: P.87.

Fig. 15 a preliminary version of the new system. 5

Drawing by author, 3 November 2022

Fig. 14 The 8 inherent values in heritage classified by Pereira Rodgers, 2007 5

Pereira-Rodgers, A., J. Post, and P. Erkelens. *Re-Architecture: lifespan rehabilitation of built heritage*, 2007.

Fig. 16 The Reglazing Modernism intervention classification 6

Ayón A, Pottgiesser U & Richards N, *Reglazing Modernism*, Vol. 1. 2019, Birkhauser Verlag GmbH, Basel, P. 33.

Fig. 17 Rodgers' classification of seven interventions, diagram made by Lin M, 2022 6

Drawing by Lin M, 2022

Fig. 18 Current selected facades to conduct the research (photos taken in 2022) 8

Photos by author, 2022

Fig. 19 A model to demonstrate Hoog Catharijne's linkage function 9

Model photo by author, 2022

Fig. 20 A diagram of the methodology and theories 10

Drawing by author, 2022