Sustainable Business Design

Graduation Thesis

Master of Science Management of Technology

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Abstract

There is an urgent and growing need for adopting principles of sustainability in the tourism sector.

The fact that more sustainable tourism business models are required raised the question among managers at Company Alpha whether the concept of Project Beta which is a service innovation for markets characterized by high demand growth, scarcity and uncertainty might be seen as a sustainable tourism solution.

This lead to the research question: to what extend can Project Beta be modified to fit the sustainable tourism market?

For the case under study, we used the business model framework called STOF to assess the business model of Project Beta. Based on interviews and literature research, I identified critical factors for the design and successful adoption of Beta in the tourism market. The main finding is that the STOF model, used primarily for designing the business model for mobile services, can be applicable as a framework for business model innovation in the tourism sector and additionally the reinforcement of the concept of alignment between the business model and the marketplace.

A case study in which the new tourism business model is adopted in the Galapagos-Ecuador is carried out.
Acknowledgements

I would like to express my deep and sincere gratitude to my supervisors: Dr. Erik den Hartigh, Dr. Luuk Simons and Dr. Roland Ortt. Their wide knowledge and logical way of thinking have been of great value for me. I would also like to express my sincere thanks to the managers of Company Alpha for their understanding, encourage and personal guidance throughout this present thesis.
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Chapter 1

Introduction

1.1 Research topic, research questions, research objective

Business model innovation not only involves a wide array of concepts, elements, drivers and factors but also demands the coordination of a large numbers of actors. In order to successfully manage innovation and further achieve an outstanding performance, recognized authors such as Drucker in 1986, Chesbrough and Rosenbloom in 2002 have attempted to create different approaches and frameworks to describe and represent business models.

Over the past decade, companies worldwide have used corporate venturing (CV) as a means of revitalizing their operations, building new capabilities, and achieving strategic renewal, creating value for shareholders (Yang et al., 2008). Company Alpha is the innovative corporate venturing department within a large international service organization. Company Alpha’s business approach relies on the blue ocean strategy (Kim and Mauborgne, 2004) aiming at making the competition irrelevant through the creation of entirely new markets by radical innovation. The type of projects launched by Company Alpha demands a high level of innovation.

Among different projects being developed by Company Alpha, Project Beta is a service innovation that aims to transfer the trust-based interactions of an international service organization into non-financial markets characterized by high demand growth, scarce goods, emotional attachment and uncertainty. The business model behind Beta relies heavily on ICT and demands the coordination of a large number of stakeholders such as governing bodies, nongovernmental organizations, business process designers, information system staff and others in a very dynamic environment.

At first glance these factors: scarcity, high growing demand, uncertainty and emotional attachment seem to converge on the tourism market. There exists environmental uncertainty over those endangered tourist destinations due to some of the most beautiful and awe-inspiring sites around the world are rapidly deteriorating and disappearing. While natural forces have in part been responsible for this, it is also being accelerated by human intervention. For many destinations, the numbers and types of visitors along with the cumulative effects of whose activities exceed the carrying capacity of these sites. The value of experiencing these unique sites- a genuine emotional attachment on the part of the tourist- is significantly compromised when they are enjoyed by too many other people;
this is due to physical damage: fragile ecological systems may be unable to recover from overuse therefore stricter restrictions on the amount of visitors- scarcity- are introduced.

A proper framework is needed to identify, evaluate and develop a viable and feasible innovative service based on the core concept of Project Beta that can be seen as a sustainable solution for endangered tourism destinations.

There exist different frameworks that accurately portray business models of services and products, in this aspect Bouwman (2008) considers that the STOF model and its four core components: Service, Technology, Organization and Finance has shown to be an effective tool for describing what a business model should look like, focusing on the role of governing bodies, responsible and accountable for all major decisions in the network. In fact, Bouwman (2008) also manifests that the STOF model has proven to be successful in terms of designing the business model for mobile services, and it seems to fit as a tool to design tourism business models where governing bodies play a central and decisive role in promoting the development of responsible and sustainable tourism.

The master thesis aims to explore the concept of Project Beta as an initiative for sustainable tourism by using STOF model.

1.2 Research Question

The proposed business model is required to suit the principles of sustainable tourism which requires the balancing of three elements: economy, environment and society. The main research question of this dissertation is:

Central Research Question: To what extent can Project Beta be modified to fit the sustainable tourism market?

A systematic approach for the design and design process of the business model of the innovative service is required. De Vos and Haaker (2008) point out that the STOF model provides a rigorous business design, thereby reducing the chance of overlooking important issues and prevent market failure. The description of the main concepts, components and the usage of the STOF model as the general framework for service innovation is presented in chapter two.

In order to make clear who the business actors are in Beta and to make their relations explicit, a description of Project Beta in terms of service, technology, organization and finance is needed. It raises the sub-research question 1.

Sub-research question 1: What is Project Beta?
For the design process of a specific service concept that certainly creates value for customers, a clear understanding of principles behind sustainability and tourism is considered necessary. De Vos and Haaker (2008) state that understanding the external forces in the environment helps innovation managers to satisfy business requirements and increase market potential; therefore sub-research questions 2 and 3 are raised.

**Sub-research question 2:** What is a sustainable tourism solution?
**Sub-research question 3:** How Beta can be seen as a sustainable tourism solution?

There comes a time in the design process where certain components of the business model of Project Beta must be adjusted to the principles of sustainable tourism. To determine whether the modified business model might be applicable to any type of markets in which scarcity, increasing demand and sentimental bonds converge led to the fifth sub-research question:

**Sub-research question 4:** What is the applicability of the re-defined new business model? At this section, innovation managers will review application areas for the new business model.

### 1.3 Scientific background

Bouwman (2003) point out that modern economies depend on innovation in services for their future growth. Over the past few years, business models and service innovation have been an important topic; however service innovation is a critical but largely unstudied segment of innovation due to it is often the case that innovation is relatively difficult to define.

The increasing interdependency between social responsibility, environmental care and economic viability affects the ways in which our society lives and works. More than ever, service innovation for sustainability is needed demanding new business models in which iterative processes of interactions with prospective stakeholders take place.

Project Beta applied as a sustainable tourism initiative will present the process for the creation of a network of organizations in which equitable participation by relevant stakeholders that share in some large extent the fate of the whole community is at the heart of this process. It is crucial the design process of the new Beta business model in which openness and transparency in how users access to the new service over the Internet are relevant.

According to Bouwman (2008) service innovation is directly related to business models that support these services, i.e. services can only be successful in the long run with a viable business model that creates value for its customers and providers.
In the section 1.1 the Research Questions have been formulated and each of them might call for a different methodology. The main research goal of this dissertation is to determine to what extend Beta can be modified to fit into the sustainable tourism market; therefore a theoretical description of Project Beta, business models, STOF and sustainable tourism will be required.

The nature of this research aims not only to the understanding of a phenomenon but also a problem solution approach. It is about finding the concepts and relationships that allow expressing the business logic of Project Beta that makes it possible to be applicable as a sustainable tourism solution.

Library research and literature analysis methodologies embody the basis for the definition of sustainable tourism, business models and STOF. Among the different existing business models the STOF model will be the framework for designing the business model of Project Beta as a sustainable tourism solution. Bouwman, De Vos and Haaker (2008) point out that STOF can be used as a method for designing the business model of a specific service concept.

De Vos and Haaker (2008) highlight that the STOF method is very useful in the early stages of service innovation therefore it will be used initially to describe the current business model of Project Beta in terms of the four domains (Service, Technology, Organization and Finance). Interviews to innovation managers at Company Alpha will provide accurate and relevant information about Project Beta.

In order to evaluate the viability of the business model of Beta in the sustainable tourism sector, those factors that are critical to the success of the innovative service need to be identified. Those factors of critical importance will assess the domain models of Beta.

Library research, theory-based literature analysis and interviews will bring the design process one step forward by understanding the principles behind sustainable tourism development and subsequently identifying the critical success factors for the adoption of sustainable business models in tourism.

A more detailed assessment of the business model is carried out. The purpose of this evaluation is to bring to the attention of the innovation manager the critical design issues for each domain- Service, Technology, Organization and Finance. These specific requirements will demand careful consideration and will shape the form of Beta to clearly fulfill the criteria in order to be seen as a solution that tackles the negative effects of overtourism.
Bouwman et al (2008) point out that it is important to understand the Critical Design Issues (CDIs) involved in business models and their interdependences and how they are linked to the Critical Success Factors (CSFs).

A third assessment of the proposed business model is carried out. Interviews to those potential actors include organizations within the established tourism industry, particularly tour operators, national and local government representatives, natural resource agencies, non-governmental organizations and local communities will provide a good insight about the robustness and adaptivity of the innovative service.

For Palvia, Mao et al (2003) a case study generally refers to the in depth study of single phenomenon, e.g. one application, one technology over time in a single organization. A case study is carried out in the Galapagos Islands. The archipelago and the surrounding marine reserve have been called a unique “living museum and showcase of evolution” being added to the UNESCO list of World Heritage in danger in 2007. The Galapagos Islands face irreversible damage unless the growth in tourism is curbed. The case study serves as a method to test and evaluate the innovative new service later referred as Sustainable Green Solution (SGS). The methods to be applied and their definitions are:

<table>
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<th>Methodology</th>
<th>Definition</th>
<th>Sub-research question</th>
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| Literature review, secondary information within Company Alpha and conceptual analysis of literature research | Literature review and analyses of existing literature about business model frameworks, derivate financial instruments and sustainable tourism attempting to build new groundwork | 1. What is Project Beta?  
2. What is a sustainable tourism solution? |
| Phone interviews, qualitative data collection and analyses. | Research in which information is obtained by asking respondents questions directly. The questions may be loosely defined, and the responses may be open-ended. | 3. How Project Beta can be seen as a sustainable tourism solution? |
| Case Study Galapagos | Study of a single phenomenon over a logical time frame. This methodology is further specified in Chapter 3 | 4. Review of application areas for the new business model. |

Table 1.1: Methodology
1.5 Scientific relevance

The increasing incorporation of information technologies into economic activities has induced structural changes in what businesses do and how they offer value. New trends and the increasing development of communication technologies allows tourism suppliers and tourists to communicate with each other on a global basis and it can cause changes in business models and triggers service innovation.

Existing literature has introduced the STOF model as a dynamic framework for service innovation and business model in the telecommunication market and has presented Project Beta as a service innovation in the European soccer market, in addition this research presents insights towards a better understanding of the STOF model and Project Beta for developing and managing service innovation in the sustainable tourism sector. This study has scientific relevance as well because includes an analysis of the weighted lottery as a distribution mechanism to allocate scarce goods in the context of sustainable tourism.

1.6 Management relevance

For managers the topic is relevant because it brings together academic research and management practice on innovation in services. For managers, it is important to understand the dynamism in different markets e.g. sustainable tourism and successfully adapt the company’s business model to these changing forces. This research will evaluate the business model of Project Beta and its potential for further development and expansion to new markets.

1.7 Table of contents

Chapter 2:
This chapter contains the theoretical foundations of business models, the STOF model, sustainable tourism and derivate financial instruments which is intended as a background material to provide the basis for the further analysis and design process of the business model of Project Beta.

Chapter 3:
This chapter provides an understanding of how the research was divided and conducted-survey methods, participant selection criteria, collection and analysis of qualitative data-in order to obtain relevant information needed to answer the central research question and sub-research questions.

Chapter 4:
This section describes the critical design issues and success factors highlighting those findings that will shape certain components of the business model of Project Beta to fit the sustainable tourism context.

Chapter 4 includes a qualitative case study in the Galapagos Islands which is carried out in order to explore the implementation of the modified Project Beta in the tourism business model of Galapagos.

Chapter 5:
This chapter includes conclusions deduced from the results and a discussion of findings that relate to the central research question of this study.

**Figure 1.1:** Table of contents
Chapter 2

Theoretical Framework

This study explores to what extent Project Beta can be modified to fit the sustainable tourism market. In this regard, a proper framework for portraying business model innovation is needed along with a clear understanding of the principles and actors behind the development of sustainable tourism solutions. This chapter will describe the theory of the process of business model innovation. It proceeds in four sections. Section 2.1 reviews the theory business models and the STOF model. Sections 2.2 and 2.3 discuss some concepts and different approaches towards the development of sustainable tourism solutions which provide the background for the identification of critical success factors in the adoption of sustainable business models. A clear explanation of the business model of Project Beta begins in section 2.4 with a description of BETA in terms of four domains: Service, Technology, Organization and Finance.

2.1 General Business Models and STOF

Giesen (2009) of IBM Global Business Services points out that innovation in business models is a success differentiator. A proper framework for understanding the process of business model innovation is needed, so Company Alpha will succeed in designing a competitive sustainable business model. Section 2.1 summarizes different definitions and components of business models and presents the STOF model as a suitable framework for business model innovation.

2.1.1 Definition and Components

The concept of the business model was widely used in management practice during the e-business boom in the mid 90s. Consultants and academic authors have attempted to define and to decompose the term business model into its atomic elements or components. Krueger (2006) states that the primary goal of business model is to support the decision-making process from the business process level to support the implementation of strategic company objectives.

Many academics have offered definitions of the term “business model” and developed their own frameworks to conceptualize elements and their relationships. Those frameworks have some similarities and differences mainly in the level of complexity in which definitions, components and their relationships are analyzed.

Amit and Zott (2001) point out that e-business is the business conducted over the Internet and considering that the value proposition of Project Beta is offered via Internet, a clear understanding of the dynamics of e-business models is needed in order to develop a
competitive advantage. Osterwalder and Pigneur (2002) consider that the understanding and use of e-business models is essential in an increasingly dynamic and uncertain business environment for the following reasons:

1. The process of modeling social systems or an ontology- such as an e-business model- helps identifying and understanding the relevant elements in a specific domain and the relationships between them (Ushold et al., 1995; Morecroft, 1994)
2. The use of formalized e-business models helps managers easily to communicate and share their understanding of an e-business among other stakeholders (Fensel, 2001).
3. Mapping and using e-business models as a foundation for discussion facilitates change. Business model designers can easily modify certain elements of an existing e-business model (Petrovic et al., 2001)

There exists growing literature on e-business models by academics and consultants (Osterwalder and Pigneur, 2002). Among different generic e- business models, the locus of attention differs from model to model. Some have an enterprise centric view and others focus on strategy or operational aspects. STOF model addresses service innovation by being structured into four components: service, technology, organization and finance, the four main pillars of a business model. Additionally, the degree of maturity- which refers to its evaluation and use- of STOF model is high. STOF model developed in 2003 (Faber et al., 2003) has been applied to analyze existing business models or to compare them and proved to be successful in terms of designing the business model for mobile services. In this regard, STOF model aims to respond important questions needed to design a viable BETA business model: why would customers buy the service? What is the added value of the service? Which value network is needed? What are the required investments to develop and introduce the service? What are the expected benefits and risks and how are distributed among partners?

Existing literature on business models e.g. Osterwalder and Pigneur (2004), Timmers (199999) Saloner and Spence (2002), presents different definitions and components. These concepts and elements vary between authors; however most of these definitions can be summarized in four key aspects:

1. The business model encapsulates the way in which a company uses its value chain and interacts with members of the value system to generate revenues.
2. The business model allows a common understanding, sharing and clear communication of the business idea among involved stakeholders.
3. The business model permits a company to analyze the similarities and differences with competitors triggering innovation and encouraging efficiency.
4. A business model can be seen as the link between strategy and business processes.

Different business model frameworks have been developed varying in scope and purpose. The existence of so many different business models points out the lack of a common
framework; however all these frameworks e.g. referred as Business Model Ontology (BMO), Resource-Event-Agent (REA) business model, STOF (Service, Technology, Organization and Finance) business model commonly outline what value a company offers to which customer segment.

Different academic approaches attempt to identify the business model components and how they relate to each other.

Among relevant academics such as Afuah and Tucci (2002), Chesbrough and Rosenbloom (2002) whose papers describe or model business model components, Rayport and Jaworski (2004) presented four main components of e-business models: Value proposition, Offering, Resource system and Revenue models and Radovilsky (2005) proposed a set of comprehensible set of components: Value proposition, Value-added e-commerce offerings, Supporting resources, Revenue and cost models, and Value creation.

Despite descriptions of the business model components vary greatly regarding their depth and rigor, ranging from simple enumerations to detailed descriptions, some components are repeated or cited frequently by relevant authors, in this regard Alt and Zimmerman (2001) suggest four elements that are commonly founded in definitions of business models: Mission which includes overall vision, strategy and value proposition, Structure which comprises actors and their role, market segments, customers and products, Process which captures the operational process needed and Revenues.

Osterwalder (2002) in his Business Model Design Temple grouped his Canvas building blocks into four main pillars which are Offer, Infrastructure, Customer and Finance. The Offer is frequently referred as value proposition is the benefit that the end-user gets from the product or service offered. The component named Customers points out the process needed to reach customers that have common needs and will respond similarly to a market action.

The Finance component helps investors understand what are the revenue model and the cost model.

The Infrastructure component constitutes that part of the business model that points out how to design a competitive strategy by taken into account the firm’s capabilities making a business mutually beneficial for a business and its customers.

Business model frameworks should be flexible enough to be able to support rapid innovation to pursue a more profitable path for instance by incorporating new technology or opportunely strengthening the added-value of the service or product.

Among the emerging technologies, advances in information communication technologies (ICT) shape business models components and their interactions creating not only new kinds of business models but also reinventing tried-and-true models. For Krueger (2006) the Internet gives business models a new flexibility; an example of the market dynamism triggered by the Internet is in the auction market which has a long history, having been
widely used to set prices. The web as an enabler of innovation has popularized the auction model and broadened its applicability to a wide array of goods and services.

Klueber (2001) pointed out that a pre-requisite to attain competitive advantage is to define an adequate business model that enables decision makers to decide upon new opportunities, therefore there is a need to choose a proper framework for business models in order to provide innovation managers at Company Alpha not only with a means to facilitate a clear definition of Project Beta but also a method that provide guidelines in the design process of business models.

Osterwalder (2004) made a thorough review of the existing literature on business models, he identified a number of authors that added a time trajectory to business models and introduced the concept of change going from a current state or business model to a desired state or new business model. Business model frameworks that incorporate the concept of change are the focus of this section, because business models are under constant pressure to change as a result of the pressure existing in the firm’s environment.

Table 1 is based on the work made by Osterwalder (2004) and Currie (2004) and summarizes six major dynamic approaches for designing and innovating business models.

<table>
<thead>
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<th>Authors</th>
<th>Characteristics</th>
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<tr>
<td>Linder and Cantrell (2000)</td>
<td>They introduce so-called change models distinguishing four basic types according to their degree to which they change the core logic of a business model, namely realization models, renewal models, extension models and journey models.</td>
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<td>Gordijn and Akkermans (2001)</td>
<td>Authors claim that business model is not about processes but about value exchanged between actors and outlines a methodology based on value model deconstruction and reconstruction. They split the process into two questions, namely, which value adding activities exist, and which actors are willing to perform these activities.</td>
</tr>
<tr>
<td>Petrovic, Kittl. (2001)</td>
<td>Authors introduce double-loop learning to explicit mental models through a systemic business model concept in order to provide a holistic, broad, long term and dynamic view to help redesign business models.</td>
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Papakiriakopoulos and Poulomenakou (2001) Authors propose a transformation method for constructing e-business models based on their analytical framework. The method includes 4 steps, ranging from the identification of players, over highlighting the value flows and identifying key competitive drivers to constructing a feedback chain.

Faber et al (2003) Propose a framework which contains four domains Service, Technology, Organization and Finance for studying the dynamics of business models, gaining a more understanding of how a company is shaped by its environment.

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<tr>
<td>Design tool</td>
<td>Extent to which the framework provides graphic tools for representing and designing business models</td>
</tr>
<tr>
<td>Changing</td>
<td>Extent to which the framework provides guidelines for developing a business model and for changing from the firm’s existing business model to the new one in order to remain profitable.</td>
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<tr>
<td>Evaluation</td>
<td>Extent to which the framework provides guidelines for evaluating the feasibility of different business models.</td>
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**Table 2.1: Business model authors (based on Osterwalder (2004))**


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<tr>
<td>Evaluation</td>
<td>Extent to which the framework provides guidelines for evaluating the feasibility of different business models.</td>
</tr>
</tbody>
</table>

**Table 2.2: Six themes of business model frameworks**
For Currier (2004) to what extent the framework provides guidelines on how to design a business model within a dynamic environment is measured on the axes named Design and Changing of the diagram. An interpretation of the diagrams shown in Figure 1 denotes that the business model frameworks of Gordijn and Akkermans (2001), Linder and Cantrell (2000) and Weill and Vitale (2001) don’t significantly integrated the two themes: Design and Changing.
Osterwalder (2004) points out that Petrovic and Kittl perceive that business model is not a description of a complex social system itself with all its actors, relations and processes, but it describes the logic of a business system for creating value.

Papakiriakopoulos and Poulymenakou (2001) identify four elements in their model namely, coordination, customer value, competition and core competences and come up with a step-by-step methodology for transforming a business model. Pateli (2003) considers that primary limitations of this framework concern the analysis which is focused on industry-level as opposed to firm level.

Amadi (2007) of Kenya Kountry Business Incubator (KeKoBI) claims that business incubation is both a complex process and an expensive proposition, and designing and innovating business models need to be given due attention by innovation managers, therefore a framework that facilitates business model innovation at the firm level is needed in order to achieve a sustainable competitive advantage in the new business environment.

Innovation managers of Company Alpha considers that a business model framework must incorporate in balance the six themes listed in Table 2 and defined by Pateli (2002), not only focusing on a detail definition of the components but also offering guidelines for the process of business model innovation.

Given that there is a huge diversity of opinions about which business model framework fits better to describe Project Beta and to deal with the design process, the approach to select the framework is to examine in depth the six business model frameworks cited in table 2.1 in terms of six themes: 1) definition, 2) taxonomy, 3) components, 4) evaluation measures 5) representation tool and 6) design methodology. The choice of the six themes is based on Pateli (2002), the theme “definition” indicates if the framework provides a comprehensible definition of what a business model is. The theme “taxonomy” shows if a classification of business model is presented. The term “components” highlights if the framework proposes a set of business model components. The theme “evaluation measures” indicates if the framework presents indicators or guidelines to measure the success or feasibility of the business model. “Representation tool” specifies if the framework presents visual modeling tools. The term “design methodology” shows if the framework includes guidelines for the design process of a business model.
In order to compare the six business model frameworks, six documents in which the authors introduced and described their frameworks were selected and assessed.

<table>
<thead>
<tr>
<th>Author</th>
<th>Document</th>
</tr>
</thead>
</table>

**Table 2.3:** The six business model frameworks and their documents

Partially based on Pateli (2002) table 2.5 shows the depth of the six themes covered for each business model framework. Themes are assessed subjectively by answering the following questions posted on table 2.4:
<table>
<thead>
<tr>
<th>Theme</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Definition</td>
<td>Does the framework provide a short comprehensible definition of what a business model is?</td>
</tr>
<tr>
<td>2. Taxonomy</td>
<td>Does the framework propose a classification of business models?</td>
</tr>
<tr>
<td>3. Components</td>
<td>Does the framework propose a set of business model components?</td>
</tr>
<tr>
<td>4. Evaluation measures</td>
<td>Does the framework present indicators or metrics to measure the success of a business model?</td>
</tr>
<tr>
<td>5. Representation tool</td>
<td>Does the framework present a set of tools or graphical representations to design business models</td>
</tr>
<tr>
<td>6. Design methodology</td>
<td>Does the framework provide guidelines for the business model design process?</td>
</tr>
</tbody>
</table>

**Table 2.4:** Questions for answering the different six themes

The answers are assigned among three categories: 1) Very minor 2) Covered to some extent, 3) Significantly covered and 4) Very significantly covered. The first category shows that the framework mentions the theme in a very small extent. The second category shows that the framework mentions the theme but does neither describe it further nor model it. The third category indicates that the framework goes one step further and describes the theme in more or less detail and the fourth category shows that the framework presents a very detailed definition for the theme.
Table 2.5: Comparing business model frameworks partially based on Pateli’s (2002) six different themes of business models. Based on a subjective assessment by the present author, each theme is ranked within a scale ranging from 4: Theme is defined in very detail to 1: Theme is covered in very small extent.

Table 2.5: Comparing business model frameworks partially based on Pateli’s (2002) six different themes of business models. Based on a subjective assessment by the present author, each theme is ranked within a scale ranging from 4: Theme is defined in very detail to 1: Theme is covered in very small extent.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linder and Cantrell (2000)</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Weill and Vitale (2001)</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Gordijn and Akkermans (2001)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Petrovic, Kittl. (2001)</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Papakiriakopoulous and Poulomenakou (2001)</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Faber et al (2003)</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

Figure 2.2 graphically represent table 2.5 in which every bar compares the business model frameworks for each theme.
Among the six business model frameworks listed in Table 2.5, the STOF model which emphasizes four domains: Service, Technology, Organization and Finance, scores highly in terms of the six themes, therefore STOF is more design-oriented compared to the other business model frameworks listed in Table 2.5 and is seen as a tool for innovation.

Bouwman, Faber, Haaker, Kijl and De Reuver (2008) state that the STOF model focuses on customer value, for them the starting point for any business model is the customer value of a product or service, and on the organizational, technical and financial arrangements needed to provide a service that offers value to customers and allows the providers of the services to capture value as well.

The STOF model prepare individual and teams to understand how external forces in the environment such as technology, market and regulations shape the business model components of service, technology, organization and finance. Critical Design Issues (CDI) and Critical Success Factors (CSF) are taken into account at the very beginning of the design process of the business model.
Generally speaking, De Vos and Haaker (2008) point out that the STOF method consists of four steps. In the first step – the Quick Scan – an initial sketch of the business model is made. This basically means a description of the service and the intended value proposition, a value network, a technical architecture and a financial model. In the second step – evaluation with Critical Success Factors CSFs – the viability of the Quick Scan result is assessed. The initial business model is refined in step three, by specifying the Critical Design Issues CDIs. A robustness check is carried out in step four. De Vos and Haaker (2008) conclude that after the four steps have been completed, a feasible and viable business model has been designed with respect to the context and conditions that are expected.

Based on the description of the STOF method, figure 2.4 shows the four steps and describes the approach to design a new service concept originated from the business model of Project Beta in the sustainable tourism context:

**Step 1** refers to the Quick Scan, in this case the initial sketch of the new business model corresponds to BETA – issuing the rights and the existence of a secondary market to trade the rights- is examined in the sustainable tourism context and initial design choices
are formulated. The business model of Project Beta is further explained in the Section 2.

**Step 2** refers to the evaluation of the outcome of the Quick Scan on the basis of the Critical Success Factors (CSFs). De Vos and Haaker (2008) point out that the evaluation helps to determine which parts of the business model have to be modified.

**Step 3** refers to the specification of Critical Design Issues (CDIs) for each domain of STOF model which helps to refine in detail the new business model.

**Step 4** refers to the internal and external evaluation of the new business model in which relationships between the domains and the sensitivity with regard to changes in the value network are examined.

![Figure 2.4: Design steps in the STOF method](image-url)
The STOF model and method will be used to describe the business model behind Project Beta in terms of the four domains: Service, Technology, Organization and Finance and to frame and understand the process of analyzing the existing business model of Beta to subsequently design a new concept that fits in the sustainable tourism context.

2.2 Project Beta

Section 2.2 is designed to answer the sub-research question 1: What is Project Beta, based on interviews with innovation managers at Company Alpha, the section contains a description of the service, a value network, a technical architecture and a financial model of Project Beta. Due to a confidentiality agreement for disclosure of the description of Project Beta in Appendix A please refer to the email address: H.AlvarezAlvarez@student.nl

2.2.1 Options (Finance)

Section 2.2.1 is set forth in Appendix A

2.2.2 Describing Project Beta through the STOF model

Section 2.2.2 is set forth in Appendix A

The next step to follow is to frame the service concept and value proposition of Beta within sustainable tourism.

2.3 Sustainable Tourism

Section 2.3 is designed to answer the sub-research question 2: What is a sustainable tourism solution, by addressing the concept, components and background information required to achieve sustainability in the tourism sector. The goal of this section is to explain facts about sustainable tourism so innovation managers at Company Alpha come to understand the principles of sustainable tourism and become able to implement these principles in the design process of the new business model.

2.3.1 Concept of sustainable tourism

The World Tourism Organization (2009) defines sustainable tourism as “tourism which leads to management of all resources in such a way that economic, social and aesthetic needs can be filled while maintaining cultural integrity, essentials ecological processes, biological diversity and life support systems”. Sustainable tourism seeks to achieve the
best balance between economic benefits and social and environmental costs (McKercher, 2003).

McKercher (2003) concludes that sustainable tourism has four pillars:

- Economic sustainability which aims at maximizing economic benefits in such a way that is profitable in both the immediate and long term,
- Ecological sustainability, it refers to the development that is compatible with the maintenance of essential ecological processes, biological diversity and biological resources aiming at the reduction of negative impacts to environmental heritage.
- Cultural sustainability which increases people’s control over their lives and is compatible with the culture and values of those affected and strengthens the community identity.
- Community sustainability- that is designed to benefit local communities and generate/retain income in those communities.

Despite some governments are creating new policies to foster sustainability, sustainable tourism is hard to achieve. The four pillars of sustainable tourism face critical challenges from different actors and segments in the tourism sector and as a consequence yet many communities fail in their attempts to implement sustainable tourism initiatives

Economic sustainability copes with:

- Improving the economic well-being of residents through economic growth and job creation is a higher national priority than conservation.
- Tourism and especially large scale mass tourism is pursued because of the foreign direct investment and foreign exchange it generates.

Ecological and cultural sustainability copes with:

- A lack of strong national sustainable development framework under which tourism can fit
- A weak institutional framework with inadequate control mechanism
- A lack of commitment by tourism operators to safeguard the local environment and host cultures

Community sustainability copes with:

- Communities pursue tourism without understanding fully its implications
Consequently, a sustainable tourism solution must strive to deal with the critical challenges and achieve a degree of balance among the four principles.

At international conferences on sustainability and tourism management, officials and experts worldwide called for sustainable tourism development at world heritage sites amid of global booming of the industry in recent years. For McKercher (2003) governments must take the lead in partnership with other levels of government, host communities and the tourism industry in establishing national tourism objectives, developing a shared vision and establishing a policy framework to achieve those objectives.

Stephen Gregg Chairman of the Sustainable Tourism Cooperative Research Centre (STCRC) highlights that shared vision, national tourism objectives and a strategic framework that look beyond short-term considerations including all relevant stakeholders should be adopted before any sustainable tourism initiative is presented and to accomplish this, three aspects are fundamental:

1. Government, regional and local authorities should recognize sustainable tourism as a top priority.
2. Business actors should aim to balance their tourism economic activities with people, culture and environment
3. All stakeholders should have a shared pursuit of long-term growth and prosperity.

Different stakeholders involved in tourism have their particular ideas, issues and interests. If all groups are to benefit, the perspectives of these groups need to be considered in making decisions for the future and achieving positive outcomes for all (Department of the Environment and Heritage, 2004).

Oviedo (2009) of the Galapagos National Park Service an organization that aims to improve the quality of life for the people of the islands through environmentally-oriented tourism, points out that there is a problem of multiple actors, in fact sustainable tourism involves a range of stakeholders in the local and regional tourism industry and it generates a communication gap between communities and private sector and a lack of coordination of efforts.

The starting point to foster sustainable tourism is the definition of a vision- an inspirational description of what an organization would like to achieve or accomplish in the mid-term or long-term future- and objectives- which are the targets towards which management is directed.
Strategy is the process of determining appropriate courses of action for achieving organizational objectives - sustainability. All projects and actions should have to be validated against this strategy and projects that go against this strategy should be eliminated. A sustainable tourism strategy defines the priority issues, the stakeholder community, the potential objectives and a set of methodologies to reach these objectives.

During the Peak District Tourism Forum (2000) held in the United Kingdom, a conclusion was that to build a sustainable tourism strategy, the participation of all relevant stakeholders is needed and there will be a continuing need, for the strategy’s ongoing development and implementation, for wider consultation with, and involvement of, the local community and public, private and voluntary sector organizations.

This section has identified the four pillars of sustainable tourism and challenges in the adoption of sustainability in different tourism business models and is considered in chapter 4 section 4.1 towards the identification of critical success factors to assure that the new business model creates value for the customers and for the business network.

2.3.2 General sustainable tourism solutions

New initiatives must aim to provide solutions to those complex challenges that tourism industry faces and effectively to contribute towards the development of a more sustainable and socially responsible tourism business model. Martin and Woodside (2008) point out that sustainable solutions differ across stakeholders in the tourism sector; those initiatives that are most desirable for tourism operators will not, in general, be the same as those that are most desirable for local residents; therefore the search for a tourism solution must combine environmental sustainability while considering those multiple actors’ interests. The solution must lie somewhere between the optima for each distinct group.

The International Bank for Reconstruction and Development (1997) pointed out some relevant factors to ensure sustainability. The appropriate mix of market and government activities is determinant to achieve sustainability, markets and governments are complementary. In this regard, well-designed regulatory systems provide the solid...
framework for sustainable development protecting people and the environment. When markets such as tourism involve many stakeholders, an umbrella organization can reduce coordination problems and gaps in information by bringing together different actors and their interests.

In order to identify criteria for designing sustainable tourism solutions, a phone interview session among representatives of the local government, tour operators and environmental agencies in the Galapagos Islands took place at Company Alpha, during which they were asked to identify criteria that general sustainable initiatives aiming to cope with over tourism must fulfil.

<table>
<thead>
<tr>
<th>Interviewee:</th>
<th>Insights:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local government</td>
<td>Solutions should involve actively the collaboration of different actors in the tourism industry and maximize economic benefits to the local community while taking into account social and cultural heritage.</td>
</tr>
<tr>
<td>Tour operators</td>
<td>Solutions should encourage businesses to become more sustainable in the long term. The costs of implementing the solution(s) should not outweigh any possible financial gains</td>
</tr>
<tr>
<td>Environmental agencies</td>
<td>The solution should focus mainly on reducing the negative impacts to the environment caused by mass tourism.</td>
</tr>
</tbody>
</table>

Table 2.6: Criteria for general sustainable tourism solutions

A qualitative analysis showed that the responses are around four main themes: effective sustainability planning; maximizing social and economic benefits for the local community; enhancing cultural and natural heritage; and reducing negative impacts to the environment. The following criteria were identified by tourism actors:

- Solution(s) must protect the natural and cultural landscape while **minimising the adverse effects of tourism**

- Solution(s) must be ethical which means that any sustainable tourism initiative must fulfil the four principles- **economic, ecological, cultural, community**- of sustainability.
• Solution(s) must make cultural and natural heritage tourism **accessible for everyone** in a sustainable manner.

• Solution(s) must involve actively the **collaboration** of different actors in the tourism industry.

• Solution(s) must be perceived as **fair** with an equal balance amongst multiple actors’ interests.

• Solution(s) must be part of a governance mechanism. A **regulatory framework** and **flexible incentives** are forms of government mechanisms that can solve environmental problems.

• Solution(s) must take into account effective **market-based economic instruments (MBI)**. The term is used for mechanism that create new markets, but also for actions such as taxes, subsidies or regulations that affect existing markets. MBIs use price or other economic variables to achieve environmental goals.

• Solution(s) must incorporate **information and communication technologies** which play an increasingly important role in the tourism industry.

For tourism actors, these criteria should be the minimum standard that any tourism business solution should aspire to reach in order to protect and sustain natural/cultural sites threatened by over-tourism; therefore innovation managers must take them into consideration in the design process. The criteria described above will be cited in chapter 4, section 4.1 towards the identification of critical success factors to ensure the successful design and adoption of the new business model as a sustainable tourism solution.

**2.4 Different approaches towards the development of sustainable tourism solutions.**

Section 2.4 addresses management tactics and techniques to achieve sustainability in more detail. Managers have at their disposal a wide array of strategies to achieve established sustainable tourism vision and objectives.

Three strategies can be considered when destinations reach a critical stage of capacity constraint: increasing the carrying capacity, dispersing the pressure and limiting access. Linsmeier (2008) stated that the concept of scarcity is subsumed in the notion that an entity can limit access or the right to an economic resource from others and considering that one of the main characteristics of Project Beta is scarcity, the focus of this section is primarily about limiting access as a tourism strategy.
2.4.1 Negative environmental impacts of tourism

Negative impacts from tourism occur when the level of visitor use is greater than the environment’s ability to cope with this use within the acceptable limits of change. The limit to tourism development is called the tourism carrying capacity—that is the maximum number of visitors a destination can host.

Coccossis and Mexa (2004) consider that tourism carrying capacity has a multitude of dimensions. The number of visitors may be limited because the physical structure of a destination is compromised (known as physical-ecological carrying capacity), because the local society loses its character (called social-anthropological carrying capacity) or because loss of human labour in other sectors due to tourism attraction (known as political-economic carrying capacity).

Eagles et.al (2002) point out that problem situations in sensitive tourist destinations that directly or indirectly affect carrying capacity revolve around five types:

- Illegal actions, for instance collecting fish, birds or other wildlife.
- Unavoidable actions, for example human body waste.
- Careless actions, for instance littering, noise or other nuisance activities.
- Unskilled actions, for example touching coral when diving, or selecting inappropriate camping spot.
- Uninformed actions, for example boating too close to marine mammals, collecting dead wood for firewood.

McNeely and Thorsell (1989) pointed out that in order to reduce negative impacts; management must determine the level of visitor use that an area can accommodate, “maintaining high levels of visitor satisfaction and few negative impacts on the environment”

2.4.2 Tourism management tactics and techniques

Management tactics and techniques are implemented to control, influence and mitigate visitor impacts on those areas with high levels of use.

Eagles et.al (2002) based upon Manning (1979) and Cole et.al. (1987) defined two approaches to safeguard destinations in jeopardy; the first approach aims to reduce use of the entire endangered or protected area:

- By limiting the number of visitors in the entire protected area
- By limiting the length of stay
- By encouraging the use of other areas
- By requiring certain skills and/ or equipment
• By charting a flat visitor fee
• By making the access more difficult in all wilderness

A second approach adopted is to reduce use of those specific problem areas:

• By informing about problem areas and alternative areas
• By discouraging or prohibiting use of problem area
• By limiting number of visitors in problem areas
• By encouraging/ requiring a stay limit in problem areas
• By making access harder/ easier to areas
• By eliminating facilities/ attractions in problem areas; improving facilities/ attractions in alternative areas
• By encouraging off- trail travel
• By establishing different skill/ equipment requirements
• By charging differential visitor fees

One fairly common and direct technique to cope with high levels of visitor use is that of use limitation. Limitations can be used to control the number of visitors entering a particular area in any given time period, their access point and types of activities they may undertake. Eagles et al. (2002) identified that some key measures for limiting either seasonally or temporally visitor use are:

• Limiting the number of visitors either in the entire protected area or in problem areas,
• Limiting the maximum number of people in one group of tourists or recreationists travelling together (known as group size limit),
• Allocating to specific individuals or groups before entry into a protected or endangered area (known as pre-assignment)
• Prohibiting all or some types of, tourist use of particular areas (known as area closures).

Aforementioned measures when implemented have their benefits and costs, which are summarized in the following table:
<table>
<thead>
<tr>
<th>Measure</th>
<th>Benefits</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limiting the number of visitors</td>
<td>• It maintains use at a predetermined level</td>
<td>• It tends to generate controversy, particularly in how they are implemented, so the process used to determine the use limit is critical.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It has financial costs</td>
</tr>
<tr>
<td>Group size limit</td>
<td>• It reduces negative impacts</td>
<td>• It has financial costs</td>
</tr>
<tr>
<td></td>
<td>• Over time, users become familiar with the limits and adapt their expectations of the site accordingly</td>
<td>• Tourism operators may not welcome the imposition of limits</td>
</tr>
<tr>
<td>Pre-assignment</td>
<td>• The technique spreads the number of visitors over time but yet assures them access.</td>
<td>• There can be a substantial management cost for the pre-registration procedure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• It requires all potential visitors to know the rules and procedures for pre-registration.</td>
</tr>
<tr>
<td>Area closures</td>
<td>• All direct human influences and negative impacts at the site are removed</td>
<td>• This approach restricts visitor freedom. It requires explanation and enforcement</td>
</tr>
</tbody>
</table>

Table 2.6: Techniques for limiting visitor use based upon Eagles et.al (2002)

Except for area closures, limiting the number of visitors, group size limit and pre-assignment require distribution mechanisms to allocate tourists and visitors. Managers must take into consideration particular conditions of the endangered area when determining which limiting measures to adopt.

Section 2.4 is taken into consideration in chapter 4 section 4.1 for the critical success factors analysis. A key success factor for Project Beta which was described in detail in the section 2.2 is the notion of scarcity and this implies limiting tourist access through the use of a proper management technique to create scarcity.
Chapter 3

Research Methodology

To fulfill the primary goal of this master thesis, a comprehensible research approach was developed. The following chapter will provide an understanding of how the research was divided and conducted in order to obtain relevant information needed to answer the main research question and sub-questions. This section will present the characteristics of the research developed, explain the qualitative data collection method used to obtain information from innovation managers and tourism actors, detail how interviewees were selected and approached and describe how the data obtained was analyzed.

3.1 Research Strategy

The research aims to assess the business model of Project Beta within the context of sustainable tourism. Boar (2001) points out the need for consistency between the business model and the marketplace, because external events, forces, trends can create an asymmetry between an existing business model and the marketplace. This study will reinforce the concept of alignment between business models and marketplace and will provide insights into the consistency of the business model of Project Beta under the principles of sustainable tourism.

Bouwman et al. (2008) point out that the STOF method has been used successfully for designing viable business model for mobile services including Critical Design Issues CDIs and Critical Success Factors CSFs for the business models of mobile services however it has not been applied to design business models in other sectors such as tourism. This study will provide insights into the generic applicability of the Critical Design Issues CDIs offered by the STOF model to approach business model innovation in other sectors than the telecommunication sector.

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The research will utilize both descriptive and explorative research methods in the conduct of the study. Descriptive research is a method used to obtain information relating to the current status of a phenomenon and for this specific case it involves gathering data that describes Project Beta. Explorative research is a method often used when the problem is unclear or the subject is new to researchers (Selness, 1997) and although the concept of Project Beta is being applied in a specific European tournament sector, no research has been developed concerning the applicability of this business model in the tourism sector.

There are not theories on how to approach the design process of business models in the sustainable tourism sector. The present study uses the STOF method as an approach for
the design process. De Vos and Haaker (2008) believe that the STOF method is sufficiently robust for the design process of a new business model.

The research starts with the Step 1 which refers to the Quick Scan, an initial sketch of the business model of Project Beta. This step requires a clear understanding of Beta and its components. After that, the research continues with Step 2 and 3 which refer to the Critical Success Factors (CSFs) and Critical Design Issues (CDIs) to evaluate the viability of the business model. CSFs and CDIs will be used to identify key factors that innovation managers should focus on to design a viable sustainable tourism solution; these factors are determined through a qualitative analysis of interviews to innovation managers at Company Alpha and relevant actors in the tourism sector.

The research follows with Step 4 which refers to the internal and external evaluation of the new business model and the evaluation is done through the application of a case study.

Each step of the STOF method requires specific research methodology activities that have been grouped in four stages: Stage 1) Literature review, Stage 2) Qualitative data collection, Stage 3) Qualitative data analysis and Stage 4) Case Study.

Figure 3.1 shows each step of the STOF method and its respective stage/ research methodology activity required. Step 1 Quick Scan involves literature review grouped in Stage 1 in order to clearly understand the existing business model and to portray Project Beta in terms of four domains: Service, Technology, Organization and Domain. Step 2 Critical Success Factors and Step 3 Critical Design Issues require qualitative data collection and analysis placed in Stage 2 and Stage 3 respectively to assess the viability and feasibility of the business model until Beta is seen as a sustainable tourism solution. Step 4 comprehends a case study to assess robustness and adaptivity.
3.2 Characteristics of the research

The research approach is divided into a number of stages and upon completion the overall research goal was satisfied. Each stage is intended to respond a specific sub-research question as it is shown in Figure 3.2 and explained in the next sections.
3.2.1 Stage 1

Literature review and secondary information within Company Alpha

**Key words:** business model frameworks, derivate financial instruments and sustainable tourism

Stage one comprehends literature and secondary information review on business model frameworks, derivative financial instruments and sustainable tourism to better understand both the business idea of Project Beta and the importance of sustainability in tourism management of unique travel destinations endangered by over tourism.

Before initiating the design process and in order to response the sub-research question 1: What is Project Beta? It is necessary to summarize the key features of Project Beta; having a theoretical base of information about the finance instrument called option will provide specific insight into how Beta works in theory and consequently will permit to identify its key components in terms of the four domains: Service, Technology, Organization and Finance.

In order to answer the sub-research question 2: What is a sustainable tourism solution? Literature review has been done aiming to summarize some of the key literature on sustainable tourism definitions, characteristics, frameworks and techniques. A clear understanding of the principles of sustainable tourism development will permit to identify the criteria that BETA must fulfill as a sustainable tourism solution.
3.2.2 Stage 2
Qualitative Data Collection

**Key words: interviews by phone and in person**

The qualitative data for this research was gathered at stage two through interviews. Taped-recorded interviews and some note taking were performed in order to generate qualitative data in the development of sustainable tourism solutions. Interviews analysis will permit the identification of Critical Success Factors (CSFs) and Critical Design Issues (CDIs) for the design of the new business model within sustainable tourism.

**Interviews:**

Telephone and group interviews were the methods for the qualitative research. A total of 8 interviews were carried out. The interviews which were made through telephone calls included open-ended questions- most answers were extensive- and were developed in a very flexible way. Each interview had a duration of 45-50 minutes and was tape-recorded.

The interviews aimed to broadly explore additional design issues and success factors in sustainable tourism business models. In this aspect, the generic design issues for mobile business model (Bouwman et al. (2008)) for each domain: Service, Technology, Organization and Finance served as the starting point of the interview.

One part of the interview focused on new perspectives for tourism business models to minimize the adverse effects of over tourism on the environment including limiting tourist access to the area. The other part of the interview addressed other design issues such as how ICT affects the way information about services and products in the tourism market are exchanged and new sustainable tourism revenue models.

**Interviewees:**

Selecting representative tourism actors and innovation managers was a form of purposeful sampling. To guarantee a sufficient level of expertise in the sample, the individuals selected for this study were professionals with deep knowledge involved in tourism development in the Galapagos Islands and included tour operators represented by the Ecuadorian tour operator CANODROS, local tourism council represented by the Galapagos National Institute Council INGALA and local environmental agencies represented by the Galapagos National Park Service GNPS. Innovation managers of Company Alpha were also interviewed with the purpose of obtaining detailed information of the business model of Project Beta.

To reduce cultural bias in the interview process, actors with international experience in the tourism sector that have a representative attitude were the main subjects of this study.
Knowing about their perspectives, experiences and opinions in relation to tourism and the challenges of implementing sustainability was particularly important for identifying critical design issues and critical success factors in business models for sustainable tourism solutions. In order to obtain information in a systematic way, semi-structured interviews with both open and close-ended questions were required.

The innovation managers involved in Project Beta were also interviewed for the purpose of describing BETA in terms of four domains: Service, Technology, Organization and Finance; grasping the business idea of BETA is the starting point of the design process.

The number of participants for this study was eight (8). Before being reached by telephone, participants were approached through emails and asked to participate in the study; the academic purpose of the interview was explained.

3.2.3 Stage 3
Qualitative Data Analysis

**Key words:** Critical Design Issues, Critical Success Factors

At stage three, the qualitative data analysis was made to identify Critical Design Issues (CDIs) and Critical Success Factors (CSFs) in the adoption of sustainable tourism solutions.

The STOF method consists of four subsequent steps defined in chapter 2 section 2.1.2 where CSFs and CDIs assess the expected viability of the new business model in the tourism context, therefore a clear understanding of them was one of the most important tasks in this stage. It helped to verify the consistency of Project Beta in the sustainable tourism context and assisted in determining which components of the business model should be modified or altered.

Qualitative interviews and their transcripts produced a volume of material which was first structured, condensed, categorized and then interpreted. The material was categorized into two major groups: design issues and success factors. Transcribed interviews were interpreted by the interviewer alone. Interviews with experts- tourism actors and innovation managers- provided insights into the design issues in each business model component and success factors for adopting Beta as sustainable tourism solution.

In order to assure reliability, validity and generalizability and therefore the quality of data, transcribed interviews were sent via email to the interviewee for his or her comment and then formal agreement.
3.2.4 Stage 4
Case study Galapagos

**Key words:** Robustness, adaptivity

After the above stages were accomplished, a case study on how to implement the new defined tourism business model in the Galapagos Islands was carried out. The case study will assess the robustness and adaptivity of the new business model.

During the design phase of case study research, innovation managers at Company Alpha determined that Galapagos Islands will be studied and then subsequently contacted the tourism umbrella organization INGALA.

**Criteria for choosing Galapagos Islands**

Innovation managers at Company Alpha applied the following selection criteria so most of the characteristics of endangered destinations are represented in the study in order to examine whether the new business model is robust and flexible then it can be adaptable.

- Tourism destinations either with outstanding natural or cultural value are considered for this study, and Galapagos Islands situated in the Pacific Ocean some 1000 km. from Ecuador is considered as one of UNESCO World Heritage’s representative tourism destination.

- In the Galapagos archipelago converges three factors which are characteristics required to be present for a market for Project Beta: scarcity, strong emotional bond and uncertainty.

- Galapagos Islands are considered as a scarce good due to its uniqueness; the archipelago is a unique spot of the earth with an environment nearly untouched by man. Galapagos suffers environmental uncertainty particularly caused by the danger of mass tourism.

Case study is an in depth study of a particular situation and it will be used for testing the robustness of the business model and whether it actually can work in the Galapagos tourism sector. The case study gathers responses and comments from tourism actors in the Galapagos Islands. In order to assure the quality of the robustness measurement, an inter observer reliability approach was used among interviewees to determine the consistency of their responses.

The case study was conducted and consisted of interviews with representatives from various tour operators, environmental agencies and local government in the Galapagos Islands and innovation managers.

Bouwman et al. (2008) point out that robustness is an external evaluation of the business model and has to do with the ability to cope with changes in the business environment.
and it may be assessed by asking what-if questions. The what-if questions will assess the sensitivity of the business model with regard to external influences.

What-if questions were elaborated based on De Vos and Haaker (2008) who identified as external influences changes in user requirements, regulatory changes, emerging new target groups and changing scale of operation.

Table 3.1 shows the questions adapted from De Vos and Haaker (2008).

<table>
<thead>
<tr>
<th>What-if questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 What will happen to the organizational and technology domain designs should be there a huge demand for the service?</td>
</tr>
<tr>
<td>2 Is there a tourism actor that it makes hard to set up a cap on tourism?</td>
</tr>
<tr>
<td>3 Is the design of the technological architecture modular? If this is the case, modifications to the technological infrastructure can be carried out on a modular basis?</td>
</tr>
<tr>
<td>4 What will happen to the Service design when it becomes clear that the service appeals to other target group?</td>
</tr>
<tr>
<td>5 What will happen to the Finance domain when influx of tourists decreases at a higher rate than expected?</td>
</tr>
</tbody>
</table>

**Table 3.1**: List of what-if questions to obtain insights into the robustness of the new business model adapted from De Vos and Haaker (2008)

The analysis of these answers provided the insights to respond the questions posted on Table 3.1 and therefore into the robustness of the new business model. Bouwman et al. (2008) point out that for many innovative services, the future holds numerous uncertainties, which makes evaluating the robustness of a business model a difficult task. In this research, the robustness of the new business model was tested by conducting a case study using the Galapagos Islands as an example. An interview that consisted of open-ended questions was designed; answers to these five questions provided insights into the uncertainties of applying Sustainable Green Solution into the Galapagos tourism business model. The uncertainties that might have a potentially major impact on the viability and feasibility of the new business model were identified and then in order to reduce these uncertainties innovation managers formulated strategies (See Appendix D).

The reliability of the responses was addressed by asking a second tourism actor from the same sector to comment on the same topics that the first actor was asked to comment and then comparing the observational records of the two actors. In principle a high level of agreement between tourism actors is viewed as an indicator of reliability.
Chapter 4

Findings

This study seeks to determine in what extent Project Beta can be modified to fit the sustainable tourism market, describing its business model in terms of the four domains: Service, Technology, Organization and Finance. Chapter number 4 has three aims:

- To present and discuss the results of the qualitative analysis in order to identify the Critical Success Factors CSFs and Critical Design Issues CDIs.
- To begin the design process by pointing out the drivers for the adoption of sustainability in tourism business models and comparing the four domains of Project Beta – Service, Technology, Organization and Finance- with Critical Design Issues.
- To generate a list of guidelines to develop a potential business model of BETA based on the findings.

Bouwman et al. (2008) point out that designers need to identify Critical Success Factors with regard to creating customer and network value and to understand the Critical Design Issues in business models due to its eminent importance to the viability and sustainability of the business model under study.

4.1 Critical Success Factors CSFs for Customer and Value Network

One of the initial steps of the STOF method is the evaluation of the new concept based on Critical Success Factors CSFs. Bouwman et al (2008) consider that in order to establish CSFs is necessary to identify those factors that create value for the customers and for the organizations in the business network, therefore answering the question adapted from Bouwman et al. (2008) what the service concept and the added value of Beta are within the context of sustainable tourism will provide insights into the Critical Success Factors for the new business model.

Before answering the previous question, it is necessary to summarize that Project Beta demands specific characteristics in the market: scarcity of goods, high growing demand, uncertainty, emotional attachment and the absence of close/ direct substitutes and among different markets, at first glance for innovation managers, sustainable tourism seems to match the criteria.

In section 2.2, innovation managers point out that the added value of Beta is triggered when a growing demand, uncertainty, emotional bonds and scarcity converge at the same time; therefore based on the aforementioned and considering sustainable tourism as a
context these same factors should converge in tourism destinations to match the criteria for Project Beta.

Innovation managers and tourism actors were asked to define the added value and service concept of Project Beta within the sustainable tourism sector; a summary of their comments is shown in table 4.1.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Service concept</th>
<th>Added value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewee 1 (company Alpha)</td>
<td>Limiting tourist access and then offering a market where tourists purchase permits from other tourists</td>
<td>Beta is a sustainable tourism solution that copes with non-sustainable tourism business models</td>
</tr>
<tr>
<td>Interviewee 2 (tour operators)</td>
<td>Limiting tourist access</td>
<td>A better distribution of tourist flows</td>
</tr>
<tr>
<td>Interviewee 3 (local government)</td>
<td>Setting a cap on tourism</td>
<td>Solution for conserving the outstanding site.</td>
</tr>
<tr>
<td>Interviewee 4 (environmental agency)</td>
<td>Limiting tourist access</td>
<td>Long-term solution</td>
</tr>
</tbody>
</table>

### Table 4.1: Critical Success Factors, outcome of interviews

For innovation managers the added value of Project Beta is to be seen as a sustainable tourism solution and therefore to cope with non-sustainable tourism business model; the United Nations World Tourism Organization (2007) points out that an unsustainable tourism model involves thousand of tourists eager to visit unique destinations attracted either by their outstanding historical significance or exceptional natural beauty overloading the carrying capacity of the destinations and threatening their long-term health.

Additionally managers identified two core components of the service concept of Project Beta in the context of sustainable tourism:

- Limiting tourist access which creates the notion of scarcity, and
- Secondary market trading in which previously issued permits are bought and sold.

Section 2.4 points out that Project Beta is concerned with a class of goods that are both scarce and valued for their authenticity and unmediated access and therefore Project Beta
as a sustainable initiative must be concerned with tourism destinations such as spectacular natural sites or prehistoric cave paintings because are scarce and highly appreciated and for Barney and Green (2007) of the University of Chicago access to them must be restricted if they are to survive.

To implement a limitation on tourism the intervention of a distributive authority is necessary. For Barney and Green (2007) a distributive authority which is a person or institution with the right to distribute access to a good is essential. They consider three models of distributive authorities:

- Private distributive authority which is based on ownership
- Public distributive authority based on political legitimacy, the fact that political institutions are democratic or just gives them the authority to issue laws.
- Custodianship, according to Barney a custodian has both expert knowledge about and a commitment to preserving an intrinsically scarce good.

Limiting access to a destination of either cultural or physical significance is in contradiction with the criterion cited in section 2.3.2 which points out that sustainable tourism solution(s) must make cultural and natural heritage tourism accessible for everyone in a sustainable manner. Innovation managers commented on this criterion revealing that the distribution of permits to access tourism destinations with limited carrying capacity is a key factor within the design process and it must be considered as a Critical Success Factor for the new business model.

Table 4.2 summarizes the findings based on interviews to innovation managers. The qualitative analysis permitted the identification of the Critical Success Factor.
Table 4.2: Findings based on interviews that determined the Critical Success Factor

By identifying the distribution of permits as a Critical Success Factor, innovation managers will examine distribution mechanisms with a focus on a fair and effective permit distribution among visitors. Access limitation techniques limit the number of tourists that can be handled within the carrying capacity levels. Sometimes access limitation is achieved simply when by first-come-first-served policy however it is not always an exact measure of genuine appreciation of a good.

For Barney and Green (2007) of University of Chicago existing mechanisms used to distribute access to intrinsically scarce goods –scarce and valued for experiences- by distributive authorities are as follows:

- **Price mechanism.** Nellis and Parker (2006) estimates that price mechanism can result in an allocation of resources that might not be entirely satisfactory from a social welfare perspective. If income is unevenly distributed among the population, just rich people can afford to pay higher prices for visiting those unique and limited access destinations.

- **Lottery,** many authors have argued that lotteries are used to allocate resources fairly. Participation fees are almost always charged and goods allocate by lotteries are usually non- transferable. Lottery participation fees and restrictions on transferability reduce rent- seeking from speculators.
- **Waiting list** in which access allocation may be determined by waiting time

- **Auctions**, well designed allocation auctions are transparent, fair and award the resource to the buyer(s) that values it the most, meaning they generate the maximum available revenue in a competitive buying market. Allocation auctions can be configured to allow bidders the opportunity to express their bids with a range of conditions.

- **Allocation based on merit**, this scheme is established to allow visitors to access to those unique destinations based on merit according to certain criteria.

  Barney and Green (2007) also claim that two general characteristics must meet such distribution mechanisms for intrinsically scarce goods:

  - They restrict access to the goods so that they are not degraded or diluted by over-consumption and,
  
  - They display a bias towards those who appreciate the unmediated, authentic experience of the goods and against those who desire access for other reasons.

Regarding the existence of a secondary market where permits will be sold by and transferred from one traveller or speculator to another, the qualitative analysis of interviews of innovation managers and tourism actors showed that a secondary market is incompatible with sustainable solution requirements because allowing trade will provide scalpers with an incentive to obtain permits and sell them at a higher price violating the criterion that not only people with higher income- they can afford to buy the permits- should have the access to unique tourism destinations.

In this section, a key aspect has been identified as a Critical Success Factor: the selection of a fair and effective distribution mechanism for permits to access tourism destinations which excludes a secondary market. As part of the design process in section 4.4 the CSF will evaluate Project Beta in the context of sustainable tourism.
4.2 Drivers for the adoption of sustainable business models in the tourism market

As part of the design process in the STOF method, it is necessary to identify those drivers that accelerate the adoption of sustainable business models in the tourism sector. The identification of these drivers will facilitate innovation managers a set of specific characteristics for tourism destinations.

Adapted from Vaugeois (2009) from Vancouver Island University whose study focuses on understanding the forces that have influenced the adoption of sustainability practices including motivators and constraints, three open-ended questions were formulated to representatives of Company Alpha, tour operators, local government and environmental agencies.

The comments of the participants on the adoption of sustainable tourism practices are shown in tables 4.3, 4.4 and 4.5.

<table>
<thead>
<tr>
<th>Adoption of sustainable tourism practices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Question 1:</strong> What actor(s) in the tourism sector should be involved to adopt successfully sustainable tourism initiatives?</td>
</tr>
<tr>
<td><strong>Interviewee</strong></td>
</tr>
<tr>
<td>Interviewee 1 (company Alpha)</td>
</tr>
<tr>
<td>Interviewee 2 (tour operators)</td>
</tr>
<tr>
<td>Interviewee 3 (local government)</td>
</tr>
<tr>
<td>Interviewee 4 (environmental agency)</td>
</tr>
</tbody>
</table>

**Table 4.3:** Adoption of sustainable tourism practices, Question 1
Adoption of sustainable tourism practices

**Question 2:** What sustainable practices should be incorporated into the tourism business model to cope with over-tourism?

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewee 1 (company Alpha)</td>
<td>Limiting visitor access and environmental education programs for local people and visitors</td>
</tr>
<tr>
<td>Interviewee 2 (tour operators)</td>
<td>Equal distribution of visitor flows in space and time</td>
</tr>
<tr>
<td>Interviewee 3 (local government)</td>
<td>Limiting visitor access and establishing environmental education programs for visitors</td>
</tr>
<tr>
<td>Interviewee 4 (environmental agency)</td>
<td>Limiting visitor access to sensitive areas Use of low impact or no trace practices</td>
</tr>
</tbody>
</table>

Table 4.4: Adoption of sustainable tourism practices, Question 2

Adoption of sustainable tourism practices

**Question 3:** What are the conditions that an endangered tourist destination should possess prior to the implementation of regulatory strategies?

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviewee 1 (company Alpha)</td>
<td>Cultural/natural uniqueness of the tourism destination, Environmental and economic assessment of the destination</td>
</tr>
<tr>
<td>Interviewee 2 (tour operators)</td>
<td>Before the implementation of regulatory strategies, an accurate forecast of tourism demand should be done determining visitor or tourist’s characteristics and the degree of competition or alternative tourism destinations.</td>
</tr>
<tr>
<td>Interviewee 3 (local government)</td>
<td>Well defined regulatory framework</td>
</tr>
<tr>
<td>Interviewee 4 (environmental agency)</td>
<td>Environmental assessment of the tourism destination.</td>
</tr>
</tbody>
</table>

Table 4.5: Adoption of sustainable tourism practices, Question 3

These comments were grouped into three categories: those related to the tourism destination itself, governance and visitors. The qualitative analysis revealed that tourism actors think that in order to adopt a business model that restrict visitors at a destination level, sites must possess a cultural or natural uniqueness without any close substitutes, national or local authority involvement in sustainable initiatives and awareness within the visitors on their impact on the environment. I identified that insights provided in the interviews are around four main themes, listed below and explained in a more detail:
• The uniqueness of the tourism destination,
• Elasticity of demand of tourism sites,
• Level of involvement, and
• Type of tourists

The uniqueness of the tourism destination

Unique sites around the world such as the Palaeolithic paintings and drawings found on cave walls at sites in France and Spain, the Grand Canyon, Notre Dame, the Mona Lisa and others have profound effects they have on those who see them. Despite being the heritage of humanity as a whole, those destinations are, and must be, restricted to a very few. Barney and Green (2002) of University of Chicago consider that the value of experiencing these things is significantly compromised when they are enjoyed by too many other people. Sometimes, this is due to physical damage: fragile ecological systems may be unable to recover from overuse. In other cases, scarcity may be due to physical interference: “one cannot experience the majesty of the Grand Canyon, hear the aria, or calmly reflect on the painting when crowded by too many other people”.

Cultural and natural heritage sites are considered to have outstanding universal value making these sites completely unique. Some examples of such unique heritage sites are the Taj Mahal, the Pyramids, the Acropolis, the Forbidden Palace and so many others. The uniqueness of these heritage sites gives them a monopoly or a near-monopoly (Barney and Green, 2002).

Cultural heritage sites include

• **Monuments**: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science;
• **Groups of buildings**: groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science;
• **Sites**: works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view.

Natural heritage sites include

• **Natural features** consisting of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific point of view;
• **Geological and physiographical** formations and precisely delineated areas which constitute the habitat of threatened species of animals and plants of outstanding universal value from the point of view of science or conservation;

• **Natural sites** or precisely delineated natural areas of outstanding universal value from the point of view of science, conservation or natural beauty.

**Elasticity of demand of tourism sites**

Many unique natural and cultural heritage attractions are owned by public or non-governmental organizations (rather than businesses). According to Loomis and Lindberg (2006) the very decision to retain these attractions in public ownership suggest that profit maximizing pricing such as a private firm would pursue may not meet the objectives of public ownership. Public pricing goals often involve recovery of at least some of the management costs, while keeping sites affordable to allow for public exposure to the natural or cultural heritage. Loomis and Lindberg (2006) conclude that a wider range of non-economic factors such as the reduction of negative ecological or congestion impacts affect the pricing decision in public agencies and non-profit organizations than in the private sector.

It is important to know the price responsiveness of demand to calculate the magnitude of a price increase needed to reduce visitation levels to a target amount. For Dwyer and Forsyth (2006) some tourist destinations are unique or almost unique and/or they purposely limit the number of visitors in order to protect the resource. In this regards, Dwyer considers that the Galapagos Islands of Ecuador and mountain gorilla tourism in Africa are examples of this phenomenon due to this allows these destinations to exercise market power in pricing. This leads to an economically inefficient level of visitation, but can be used to increase tourism-related fee revenue. Demand elasticity for tourism to those unique destinations is not very sensitive to price changes or what economics call “price inelastic” due to the absence of direct substitutes.

**Level of involvement**

The level of involvement achieved by national environmental protection agencies can be measured by their degree of management, degree of control and degree of decision-making (adapted from Eagles et.al (2002)). Protected agency managers are not able to solve all the problems which may affect the protected area, particularly when they originate from outside. The degree of control they can exercise is at three levels:

• The agency has **direct control** over its own operations, and can thereby minimise any negative impacts

• The agency can have an **indirect impact** on the activities of others (e.g. it may require or prohibit private sector tourism operators from undertaking certain activities); and
• The agency can **influence others but no form of control**—individuals, agencies, communities, operators, etc. The agency should employ collaborative approaches based on partnerships with others' interests which can help it achieve its aims.

![Figure 4.1: Protected area managers’ spheres of influence on tourism activities](image)

**Figure 4.1:** Protected area managers’ spheres of influence on tourism activities

**Type of tourists**

It is important for developing sustainable tourism initiatives to identify the type of tourists who visit a specific tourism site. Francis (2009) who has carried out consultancy works for the Association of Independent Tour Operators (AITO) in the United Kingdom points out that impacts of tourism are totally different based on the type of tourist, knowing the different types of tourists will enable actors to successfully implement sustainable tourism.

It has been suggested most tourists care little for sustainability issues and are more interested in “price, value for money and fun”, over and above being concerned for environmental sustainability issues (Wheeler, 2005). However other perspective shows that eco-tourists defined as those more interested in ecotourism emphasize not only direct experience in nature as the focus of the activity but also environmental learning as an outcome, and sustainability as a goal. In this aspect, Perkins and Grace (2007) of Griffith University based on a convenience sample of 260 tourists from both an accredited ecotourism venue and a mainstream tourism venue concluded that those tourists who show higher levels of interest in ecotourism are more willing to pay for sustainable services and initiatives if the choice is available.
The four drivers identified in this section will evaluate the applicability of the new business model to the tourism destination. A tourism destination that possesses a cultural or natural uniqueness, an absence of direct substitutes, with an umbrella organization that groups relevant tourism actors, is most likely to adopt successfully the new business model. A more detailed explanation is presented in section 4.6.

4.3 Critical Design Issues CDIs

The Step 3 of the STOF method corresponds to the specification of Critical Design Issues. De Reuver and Bouwman (2008) state that Critical Design Issues (CDI) are topics that need to be addressed in the service, technology, organization and finance domain of business models and can predict whether a business model will be viable. Designing a viable new sustainable tourism business model is a complex process, Critical Design Issues in business models for mobile services (Bouwman et al. (2008)) is the starting point for the identification of critical design issues for Project Beta in the context of sustainable tourism. The results of the study carried out by Bouwman et al. (2008) offers general design issues that should be addressed to improve business model performance. Innovation managers and tourism actors were asked to indicate whether they consider or not that the Critical Design Issues identified by Bouwman et al. (2008) should be considered in the design of Project Beta. A qualitative analysis provided insight into the CDIs for Project Beta in the context of sustainable tourism.

The Service Domain

Bouwman et al (2008) determined the Critical Design Issues (CDI) from the Service Domain based upon case studies involving the business models of mobile services. They are: Targeting, Creating Value Elements, Branding and Customer Retention. Adopted from Bouwman et al. (2008) innovation managers were asked to comment on Critical Design Issues for developing viable and feasible sustainable tourism business models.
Table 4.6: Critical Design Issues Service domain

Table 4.6 shows that managers agreed with three critical design issues from Bouwman et al. (2008): Targeting, Creating Value Elements, and Branding and identified a fourth CDI: Distribution Mechanism.

Distribution mechanism: an important issue in allocating permits to visit those unique sites around the world is the distribution mechanism otherwise unfettered access to them would destroy their value due to physical damage caused by overuse. In section 4.1 five distribution mechanism were identified:

- Price based
- Lottery,
- Wait-list,
- Auction and
- Based on merit.

Targeting: Another issue is defining the target group. Which endangered tourism destinations are most suitable to adopt this new approach? Which is the target group for this sustainable tourism initiative?

Creating Value Elements: Closely connected to choosing a target group is formulating a compelling value proposition for end-users; Bouwman et al indicate that the added value of a service can be based on value elements like fun, efficiency, accuracy, speed, personalization, trust, and etcetera. In this aspect, Beta as a sustainable tourism initiative should aim at providing a strategy to implement sustainable tourism development

Branding: Bouwman et al. (2008) concluded that branding was found to be an important issue in relation to reaching the customers that had been targeted. How can we properly communicate that Project Beta fulfils the requirements as a sustainable tourism initiative?
How can Project Beta be identified as a socially, environmentally and economically responsible initiative?

The description, tradeoffs and design choice for each critical design issue in the Service domain adapted from Bouwman (2008) are summarized in table 4.7

<table>
<thead>
<tr>
<th>Service Design Issues</th>
<th>Tradeoffs</th>
<th>Critical Design Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution mechanism</td>
<td>Price based, lottery, wait-list, auction and based on merit</td>
<td>Complex organization arrangement</td>
</tr>
<tr>
<td>Targeting (1) Tourists</td>
<td>Mass tourism, Alternative tourism, Natural tourism, Cultural heritage tourism.</td>
<td>Complex organization arrangement</td>
</tr>
<tr>
<td>Targeting (2) Destinations</td>
<td>Sporting events, theme parks, places of historic interests</td>
<td>Extra investment, risk of failure</td>
</tr>
<tr>
<td>Creating value elements</td>
<td>New and unique service</td>
<td>Extra investment, risk of failure</td>
</tr>
<tr>
<td>Branding</td>
<td>Company Alpha fosters sustainability</td>
<td>Organization arrangements</td>
</tr>
</tbody>
</table>

Table 4.7: Critical Design Issues, Service domain (adapted from Bouwman et. al. (2008))
The Technology Domain

Adapted from Bouwman et al. (2008) innovation managers were asked to comment about Critical Design Issues in the Technology domain.

<table>
<thead>
<tr>
<th>Critical Design Issues Technology Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2: to what extent do you agree with each of the critical design issues in the Technology domain for Project Beta in the context of sustainable tourism?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CDI’s</th>
<th>Responses innovation managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Security</td>
<td>To a great extent</td>
</tr>
<tr>
<td>• Quality of Service</td>
<td>To a great extent</td>
</tr>
<tr>
<td>• System Integration</td>
<td>To a great extent</td>
</tr>
<tr>
<td>• Accessibility for customers</td>
<td>To a great extent</td>
</tr>
<tr>
<td>• Management of user profiles</td>
<td>To a great extent</td>
</tr>
</tbody>
</table>

Table 4.8: Critical Design Issues Technology domain

Table 4.8 shows that managers agreed that Critical Design Issues for the new business model in the Technology domain are: Security, Quality of Service, System Integration, and Accessibility for Customers and Management of User Profiles;

**Security:** Bouwman et al. (2008) consider that trust of end-users and customers is partly determined in the way access to a service is granted and how security of communication and (stored) information is realized. For instance adopting the same procedure as websites like EBay to provide verifiable information before you can create an account, e.g.: an ISP email address, bank or credit card details, landline home telephone number and also acting more quickly on those who break weighted lottery conditions.

**Quality of Service:** The performance of the online platform relies on the technical architecture choice and it has a profound impact on the service offering and perceived value.

**System Integration:** It is critical how the new service can be integrated into the existing technical infrastructure, by linking together different computing systems and software applications functionality.

**Accessibility for Customers:** The accessibility of the service to the target group which is influenced by the choice of platform and architecture.

**Management of User Profiles:** Personalization of the service

The description and design choice for each critical design issue in the Technology domain adapted from Bouwman (2008) are summarized in table 4.9
### Critical Design Issue | Description | Critical Design Choice
--- | --- | ---
**Security** | How to arrange secure access and communication? | Ease to use vs. abuse and privacy
**Quality of Service** | How to provide for the desired level of quality? | Quality vs. costs
**System Integration** | How to integrate new services with existing systems? | Flexibility vs. costs
**Accessibility for customers** | How to realize technical accessibility to the service for target group? | Open vs. closed systems
**Management of user profiles** | How to manage and maintain user profiles? | User involvement vs. automatic generation

Table 4.9: Critical Design Issues, Technology domain adapted from Bouwman et al. (2008)

The Organization Domain

Innovation managers commented on the Critical Design Issues identified by STOF in the Organization domain; table 4.10 shows that Partner Selection, Network openness, Network Governance and Network Complexity are also considered as Critical Design Issues for the new business model.

<table>
<thead>
<tr>
<th>Critical Design Issues Organization Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q3</strong>: to what extent do you agree with each of the critical design issues in the Organization domain for Project Beta in the context of sustainable tourism?</td>
</tr>
<tr>
<td><strong>CDI’s</strong></td>
</tr>
<tr>
<td>Partner selection</td>
</tr>
<tr>
<td>Network openness</td>
</tr>
<tr>
<td>Network governance</td>
</tr>
<tr>
<td>Network complexity</td>
</tr>
</tbody>
</table>

Table 4.10: Critical Design Issues Organization domain

**Partner Selection**: It is important to identify those business actors that provide critical resources and capabilities, for instance, for introducing a new sustainable tourism
initiative, it is crucial the presence of an umbrella organization in the value network which represents all sectors in the tourism industry and speaks as one voice. **Network Openness:** The degree in which new business actors can join the value network and are allowed providing services to customers; here there are two organizational models: the closed model and the walled garden model **Network Governance:** Bouwman et al (2008) found a dominant actor often the one with access to the customers and end-users or the one that developed the service offering, which managing the value network. In this case, the distributive authority which is the business actor with the right to distribute access to the World Heritage Site will set up the rules with regard to collaboration and will monitor compliance with these rules, for instance calling for a cap on tourism. **Network Complexity:** Bouwman et al (2008) found that business actors tend to reduce network complexity. High number of organizations that need to collaborate with each other results in an enormous network governance load and efficiency losses and therefore by using intermediaries which act as single points of access, network complexity might be reduced.

The description and design choice for each critical design issue in the Organization domain adapted from Bouwman et al. (2008) are summarized in table 4.11

<table>
<thead>
<tr>
<th>Critical Design Issue</th>
<th>Description</th>
<th>Critical Design Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Partner Selection</strong></td>
<td>How partners are selected?</td>
<td>Access to critical resources and capabilities.</td>
</tr>
<tr>
<td><strong>Network openness</strong></td>
<td>Who is allowed to join the value network?</td>
<td>Desired exclusiveness, control, and customer reach of service.</td>
</tr>
<tr>
<td><strong>Network governance</strong></td>
<td>How is the value network orchestrated? Who is the dominant actor?</td>
<td>Customer ownership and control over capabilities and resources.</td>
</tr>
<tr>
<td><strong>Network complexity</strong></td>
<td>How to manage increasing number of relations with actors in a value network?</td>
<td>Controllability of value network and access to resources and capabilities.</td>
</tr>
</tbody>
</table>

**Table 4.11:** Critical Design Issues, Organization Domain adapted from Bouwman et al. (2008)

**The Finance Domain**

Adapted from Bouwman et al (2008), managers were asked to comment about Critical Design Issues in the Finance domain, and table 4.12 shows that interviewees agreed in
Pricing, Division of Investment, Division of Costs and Revenues, and Valuation of Contributions and Benefits.

<table>
<thead>
<tr>
<th>Critical Design Issues Finance Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4: to what extent do you agree with each of the critical design issues in the Finance domain for Project Beta in the context of sustainable tourism?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CDI’s</th>
<th>Responses innovation managers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pricing</td>
<td>To a great extent</td>
</tr>
<tr>
<td>Division of investments</td>
<td>To a great extent</td>
</tr>
<tr>
<td>Division of costs and revenues</td>
<td>To a great extent</td>
</tr>
<tr>
<td>Valuation of contribution and benefits</td>
<td>To a great extent</td>
</tr>
</tbody>
</table>

Table 4.12: Critical Design Issues Finance domain

**Pricing:** Bouwman (2008) concludes that with regard to the adoption and actual use of a service, the perceived customer value must at least equal, and preferably exceed, the price of a service. In this aspect, setting up an application fee to award non-commercial permits to visit those endangered World Heritage sites is a critical design issue. Pricing should take into account those fixed and variable costs. The fixed costs of an online distribution mechanism include personnel and IT costs for the infrastructure that is necessary to host databases, run computer servers and manage the online platform. The most important variable costs are transaction costs. The user can choose among different payment methods: credit card, direct debit, bank transfer. Transaction costs range from 6%- 10% of the gross amount, depending on the payment system used.

**Division of Investments and Risks:** Bouwman et al point out that there are financial risks involved in developing and introducing a new service as well as uncertainty about the resulting return on the investment. Project Beta should be seen as a sustainable business in which long term and widespread benefits are gained among all stakeholders.

**Valuation of Contributions and Benefits:** Bouwman et al (2008) claim that it is important to value the contribution of each partner to the service offering and the (intangible) benefits each partner receives. Project Beta must consider include all relevant tourism business actors.
### Critical Design Issues, Finance Domain adapted from Bouwman et al. (2008)

<table>
<thead>
<tr>
<th>Critical Design Issue</th>
<th>Description</th>
<th>Critical Design Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pricing</td>
<td>How to price the service for end-users and customers?</td>
<td>Realize network profitability&lt;br&gt;Realize market share</td>
</tr>
<tr>
<td>Division of investments</td>
<td>How to divide the investments among business partners?</td>
<td>Match individual partners’ profitability and risk</td>
</tr>
<tr>
<td>Valuation of contributions and benefits</td>
<td>How to measure and quantify partners’ contribution and (intangible) benefits?</td>
<td>Far division of costs and revenues</td>
</tr>
<tr>
<td>Division of costs and revenues</td>
<td>How to divide the cost and revenues among business partners?</td>
<td>Balance between individual partners’ profitability and network profitability.</td>
</tr>
</tbody>
</table>

**Table 4.13:** Critical Design Issues, Finance Domain adapted from Bouwman et al. (2008)

### 4.4 Critical design issues and critical success factors relating to creating customer and network value

The design process included in the section 4.3 the identification of Critical Design Issues (CDIs) for each domain -Service, Technology, Organization and Finance- providing the guidelines in order to define “what” issues have to be addressed.

Figure 4.2 graphically summarizes the Critical Design Issues for Project Beta in the context of sustainable tourism and the Critical Success Factors defined in section 4.1. In section 2.2.2 a list of general criteria for sustainable tourism solutions is presented, for innovation managers the new business model must fulfil these criteria to be seen as a sustainable solution and therefore it has been added as Critical Success Factors.
Interviews of innovation managers led to the identification of two critical factors for the successful adoption of the new business model: the service offered must be perceived as fair with an equal balance amongst multiple actors’ interests facilitating the access to everyone in a sustainable manner.

The criterion that cultural and natural heritage tourism must be accessible for everyone in a sustainable manner is related to the Service and Finance domain because the service offered by the new business model should be perceived as a fair with an equal balance amongst multiple actors’ interests facilitating access to everyone in a sustainable manner;
innovation managers concluded that a proper distribution mechanism (critical design issue for the Service domain) and pricing (critical design issues for the Finance domain) are directly related to these Critical Success Factors.

Different ways of coping with absolutely scarce good and services, such as pricing, rationing, have very different distributional effects; the distribution mechanism adopted to allocate scarce resources of great value should not be settled by a market-price mechanism (Stewart, 1998). In the context of sustainable tourism, owning a permit does deprive someone else of the opportunity to own one too, therefore the CDIs distribution mechanism and pricing should realize the CSF accessibility for everyone in a sustainable manner.

The business model of Beta can be defined as price-based in which permit holders can profit from the trading market, therefore an equal distribution of permits can not be guaranteed.

**Distribution mechanism and pricing**

The ideal mechanism should provide fair and transparent distribution of permits to scarce natural sites. Five distribution mechanisms have been identified as follows:

1. Price based system
2. Lottery
3. Wait-list system
4. Auctions
5. Based on merit

Rationing permits strictly either by price or auction is an alternative that tends to be good at getting permits to the right people, Sandrey, Buccola, and Brown Loomis (1980) point out that price or auctions are rarely used as the primary distribution mechanisms for these types of goods: unique natural and cultural sites across the world, often because of protest about the inequity associated with a pricing system. Those with higher incomes are more likely to obtain the permits, and this is in conflict with the idea that everyone should have equal access to natural resources.

Loomis (1980) points out that a pricing mechanism would provide the greatest efficiency but is less equitable than a lottery. The idea that everyone should have equal access to government-regulated resources plays a key role in the distribution mechanism used in Beta as a sustainable tourism initiative; a qualitative analysis of the interviews showed that a distribution mechanism must come in a form of lottery, wait-list and based-on-merit systems.

A description of the characteristics of the permit allocation system named: weighted lottery is presented.
Weighted Lottery as a distribution mechanism

Stone (2006) from the Political Science Department at Stanford University points out that a fair lottery is the appropriate procedure for allocating goods when multiple individuals have equally good claims to those goods; tourism actors interviewed agreed that the weighted lottery might be suitable for use in the allocation procedure. The use of the weighted lottery for allocating permits is one way to minimize the perception that someone with higher income receives preferential treatment or easier access than others. I define the weighted lottery as a distribution mechanism that combines lottery, wait-list and based-on-merit systems. It is called weighted lottery because the random selection system adjusts (weights) each individual’s odds of winning, allowing those who meet certain criteria (based-on-merit) or have been in the wait-list longer to have a greater chance of winning a permit.

If an applicant either meets certain criteria such as understanding sustainable ecosystems or is in the waiting list will receive a bonus (weight) which determines how many times her or his application will be added to the lottery again, increasing the applicant’s chances of drawing a permit.

Beta in the context of sustainable tourism does not offer a post-lottery market for permits. Once the permits are allocated by the lottery they are not transferable. Allowing a secondary market, after the permits have been allocated by lottery, would increase welfare among holders by allowing those who value unique natural and cultural sites to buy the permits from lottery winners who care less about tourism. By prohibiting a trading market, those people who don’t have a truly interest in visiting unique cultural and natural destinations, have no incentive to apply for a permit.

To summarize what has been done and to explain the status of the design process, Critical Design Issues and Critical Success Factors were firstly identified and a further analysis determined that the Critical Design Issues of distribution mechanism and pricing co-determine the Critical Success Factors of perception of service fairness and accessibility and consequently concluding that Project Beta must incorporate the weighted lottery as a distribution mechanism without a secondary market.

4.5 Approach for implementing the new business model

An approach for implementing the new model is required. The approach draws on an analysis of interviews with innovation managers and tourism actors where the focus was on how to move from the existing tourism business model to the new designed solution. This section aims to answer the sub-research question 3: How Beta can be seen as a sustainable tourism solution by generating a step-by-step approach towards the adoption of Project Beta as a sustainable tourism business model. A Critical Design Issue identified for Project Beta is the distribution mechanism to allocate the permits and therefore in the context of sustainable tourism the new business
model must adopt a distribution mechanism seen as fair and effective by all tourism actors.

The UN World Heritage Committee strongly recommends calling for a cap on tourism in those outstanding natural destinations where the rate of growth of tourism has outstripped the capacities of local institutions to manage the impacts consequently the first step that needs to be taken is calling a cap on tourism as a measure to control the human presence in the highly ecologically sensitive ecosystems.

The next step to be addressed is establishing the maximum number of visitors; for the UN World Tourism Organization the limits to tourism should be based on the impact of tourism on immigration as well as the direct impacts of tourism on the environment through contamination and invasive species.

For instance, the United Nations and scientists at Galapagos National Park strongly recommend capping tourism at around 100,000 people.

The third step is choosing the proper distribution mechanism to allocate the permits. The distribution mechanism should be in accordance with the principle that everyone should have equal access to natural and cultural resources in a sustainable manner and at section 4.4 a weighted lottery (combination of wait-list and based-on-merit) without a secondary market was the distribution mechanism to be adopted.

The UN World Tourism Organization points out that a sustainable tourism solution must be not only environmentally sustainable but also economically sustainable and consequently the fourth step is generating additional income -for instance lottery application fees- to preserve and maintain the natural or cultural site by improving management and conservation practices in the endangered tourism destination.

It is important that during the process of taking these steps all main stakeholders should benefit from the solution. Only a win-win situation will make sure that everyone will support the initiative.

The four steps described in the previous lines are part of a general approach; in the rest of this section a detailed description of how implementing the new tourism business model is provided by using the STOF model and its four domains.

It is important to highlight that the core aspects of the business model of Project Beta in the context of sustainable tourism- the permit lottery without a post-lottery permit market- are the final outcome of the design process, and this led us to observe that Project Beta in a specific European sport tournament described in the section 2.2.2 differs from Project Beta in the tourism context in two aspects: the distribution mechanism adopted and the peer-to-peer trading.
Innovation managers will refer Project Beta in the context of sustainable tourism as **Green Card Solution (GCS)**.

The Green Card Solution GCS comes in a form of a Web-based permit application, a process that consists of six steps:

Step 1: Create a profile. Each person listed on the Sustainable Green Solution (weighted lottery) must have a user account in the system.
Step 2: Login and create a lottery application. Once the person has a profile, he or she can login at anytime and create a lottery application.
Step 3: Submit the completed application and subsequent payment of the application fee.
Step 4: Sustainable Green Card (weighted lottery) occurs
Step 5: Completing permit application. If successful in the lottery, the winner makes a payment that corresponds to the concept of the entrance fee to the natural or cultural site.
Step 6: Issue the permit. Once the winner has paid all fees, the permit will be sent via email.

**Figure 4.3:** How Sustainable Green Solution works
Interviews with innovation managers provided insights into the business model of the Sustainable Green Solution, the STOF model and its four domains- Service, Technology, Organization and Finance- is the framework used for a detailed description.
Service Domain

Adapted from Bouwman et al (2008), context, bundling, effort and tariff, customers, end-users, expected value, value proposition and market segment are the concepts in the Service domain to be covered to define the new business model.

- **Context**

For Bouwman et al. (2008) market forces are one of the drivers of business model dynamics and in section 4.1 was seen that principles of sustainable tourism influenced the design of the business model of Green Card Solution. In the context of sustainable tourism, Green Card Solution seeks to encourage the protection and preservation of cultural and natural heritage that face serious threats from over-tourism by calling for a cap on tourism to prevent irreversible damage and by providing technical assistance and professional training to manage the existent negative impacts.

- **Bundling, effort and tariff**

For innovation managers Green Card Solution aims to implement access control to mitigate negative visitor impacts on cultural and natural heritage sites while generating revenue for conservation and local sustainable development. The weighted-lottery which combines the wait-list and based on merit is used as a distribution mechanism and displays a bias towards those who appreciate the unique and authentic experience of visiting cultural and natural heritage site. Visitors with genuine interest have a greater chance to be selected because when the lottery occurs, people can increase significantly their chances of winning a permit if they satisfy determined criteria(s) which is referred as a merit based- system and those people who did not win the permits will be put on the waitlist and their chances to obtain a permit will increase in the follow-up lotteries.

- **Customers, end-users and their expected value**

Tourism managers in the Galapagos Islands commented that stakeholders in the tourism sector demand for initiatives for introducing sustainability in their tourism activities and consequently Green Card Solution can be seen as an initiative intended to help tourism actors such as: tourist operators, tourists, local government and communities to embrace the pillars of sustainable tourism development.
• **Value proposition**

The value proposition of Sustainable Green Solution identified in the analysis of interviews with innovation managers and tourism actors is listed below:

- Because the new business model gathers relevant principles of sustainable tourism, Sustainable Green Solution aims to make optimal use of environmental resources while ensuring viable and long-term economic operations in the site.

- Managers commented that SGC leads to an optimal level of tourism value activity that can be maintained over long term.

- SGC offers a better distribution of tourism across the tourism season or outside the peak season.

- The distributive authority will exert a stricter control and accurate monitoring of visitor numbers.

- Linking and engaging local community, tourism operators, conservation groups and government.

• **Market segment**

Tourism actors interviewed commented that SGC should reach two main eco-tourism actors: tourists and regional/local tourism management offices of those destinations threatened by over tourism.

In regard to the tourism destinations, in section 4.2 drivers for the adoption of sustainable business models in the tourism market were identified facilitating innovation managers a set of specific characteristics for tourism destinations listed below:

- The uniqueness of the tourism destination: Destinations such as monuments, groups of buildings or natural sites must be considered to have outstanding value e.g. historical, aesthetic or archaeological making these sites completely unique.

- Elasticity of demand: Uniqueness allows these destinations to exercise market power in pricing. Demand elasticity for tourism to those unique destinations is not very sensitive due to the absence of direct substitutes.
Level of involvement: The level of involvement achieved by the umbrella organization of the tourism sector can be measured by their degree of management, degree of control and degree of decision-making.

Type of visitors and tourists: Those tourists who show higher levels of interest in ecotourism are more willing to pay for sustainable services and initiatives if the choice is available.

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**Figure 4.4:** Tourism destination criteria for Green Card Solution

Bouwman et al (2008) conclude that the service design serves as a guide to the technical design.

**Technology Domain**

Sustainable Green Solution is based on an online platform. Interviews with innovation managers permitted the identification of the main functionalities of the web-based platform: 1) specific travel information about the Galapagos, 2) registration for the lottery and 3) purchasing a permit.

The identification of actors in the value network permitted to determine the main users of the web-based platform: first-time visitors, members (people who registered themselves), and the IT staff to administer and maintain the platform.

The e-commerce technical architecture is based on business requirements and technical evolution trends, the platform should be able to face challenges:
• Grow infrastructure to keep up with explosive growth in transaction volume:

• Minimize administrative costs of managing the data center

• Ensure high availability of infrastructure

• Manage rapidly expanding volume of data.

Based on interviews with innovation managers the systematic requirements of the platform are: availability, reliability, massive scalability and security.

**Organization Domain**

For Bouwman et al (2008), organizational issues revolve around the resources and capabilities related to technology, marketing and finance that have to be coordinated to offer the service. Adapted from Bouwman et al. (2008) strategies, goals, actors, resources, capabilities and value activities are the relevant topics in the organizational domain to be covered in the following section.

• **Strategies and Goals**

UNESCO through its World Heritage Tourism Programme emphasizes that all actors should be committed in the development and adoption of sustainable initiatives therefore for the success of Sustainable Green Solution most relevant tourism actors must be involved in the early stages of the business model implementation and share a common strategy and goal: the development of a sustainable tourism business model that guarantees long-term benefits to all stakeholders.

• **Actors**

Innovation managers were asked to carry out a participation analysis- or stakeholder analysis as it is sometimes called- aiming to identify all different actors that are part of the value network. This analysis was used at the preliminary stages of the design process in order to incorporate interests and expectations of persons and groups in the tourism sector. They are listed below:

• Partner with a know-how to build the web-based platform
• Non-profit organizations for the conservation of the natural environment and cultural heritage, e.g. UNESCO’s World Heritage Centre and World Wide Fund for Nature
• Regional or local tourism umbrella organizations for instance Galapagos Tourism Council in Ecuador, the African Tourism Organization (ATO)
Resource and Capabilities:

Innovation managers identified technical, financial and organizational capabilities of relevant actors in the value network.

Technical capability: The technical capability with qualified experienced and trained personnel that the ICT partner possesses.

Financial and Social capabilities: Company Alpha which is strongly committed to taking further initiatives for sustainable development.

Organizational capability: International organizations for conservation and tourism umbrella bodies represent multiple segments of the tourism sector facilitating business contacts between members.

Value Activities:

Interviews with innovation managers and tourism actors permitted the identification of the value activities of those relevant actors in the value network. They are listed below:

ICT partner: value activities are development, maintenance and technical support of the web-based platform.
International organization for conservation: technical assessment and guidance towards a sustainable tourism model. These international organizations might act as a powerful tool to rally international attention.
Regional/ local tourism umbrella organization: bilateral and multilateral arrangements to establish a cap on number of visitors.

Finance Domain

Investment decisions and revenue models are one of the most important aspects to be taken into account in the business model. Adapted from Bouwman et al. (2008) initial investments, revenue sources and risks are covered in the following section.

- Initial investment

Initial investment implies that a starting capital is needed; innovation managers projected initial investment based on those values activities required for the implementation of the new business model. Initial investment covers the following value activities: building stakeholder involvement, development of the web-based platform and technical assessment of the tourism destination

- Revenue sources

Innovation managers consider the application fee for the weighted lottery constitutes the main revenue source for the service.

- Risks

Bouwman et al (2008) point out that the risks that may exist in other domains have financial consequences, therefore innovation managers were asked to identify risks in each domain of the STOF model.
Service domain: Sustainable Green Solution is not seen as a sustainable tourism initiative by end-users, therefore the perceived customer value is much lower than the assumed value.
Technical domain: The Web lottery application interface is too complex for the end-user.
Organization domain: Resistance to limiting the number of visitors between local stakeholders in the tourism sector
Financial arrangement: It describes the way profits, investments, costs, risks and revenues are shared among the actors: Company Alpha, ICT partner, International organizations for conservation and regional/ local tourism umbrella organizations
4.6 Generalization

Section 4.6 is designed to answer to sub-research question 4: what is the applicability of the re-defined new business model? In this aspect, when it comes to deciding whether or not adopt the proposed tourism business model a framework to assist innovation managers in assessing the tourism destination is needed.

<table>
<thead>
<tr>
<th>Framework and its four components</th>
<th>1. The uniqueness of the tourism destination</th>
<th>Represented in the cultural uniqueness and natural uniqueness of the destination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Elasticity of demand of the tourism destination</td>
<td>Inelastic due to the absence of direct substitutes</td>
</tr>
<tr>
<td></td>
<td>3. Level of involvement of national environmental agencies</td>
<td>Degree of management, control and decision making of national and local authorities</td>
</tr>
<tr>
<td></td>
<td>4. Type of tourists</td>
<td>Eco tourists open to initiatives to achieve sustainability goals.</td>
</tr>
</tbody>
</table>

Table 4.14: Framework for validating the tourism destination

A general framework summarized in table 4.5 was defined based on responses from interviewees who commented on the adoption of Sustainable Green Solution as a tourism business model. The qualitative analysis revealed that tourism actors think that in order to adopt a business model that restrict visitors at a destination level, sites must possess a cultural or natural uniqueness without any close substitutes, national or local authority involvement in sustainable initiatives and awareness within the visitors on their impact on the environment.

By viewing the tourism destination from four perspectives listed below, the framework provides insights into the applicability of Sustainable Green Solution.

- The uniqueness of the tourism destination
- Elasticity of demand of the tourism destination
- Level of involvement of national environmental agencies
- Type of tourists

Adapted from Hall (2008) whose research focuses on tourism planning three questions were posted to tourism actors to gain insights about the framework to assess whether the new business model is suitable for a specific tourism destination.

**Q1:** What characteristics should the tourism destination possess to implement the new business model?

Respondents commented that a tourism destination should have no close substitutes and therefore an inelastic demand. An explanation of these two characteristics is shown below:

**The uniqueness of the tourism destination:**

Interview outcomes showed that uniqueness is an important criterion and results from a combination of natural and cultural elements and resources. The uniqueness of the destination is measured in two domains: cultural uniqueness and natural uniqueness. Scales for each domain are: (1) significant and (2) very significant. The approach is to answer the questions posted on the Appendix B.

**Elasticity of demand of the tourism destination**

Barney and Green (2007) point out that the absence of direct substitutes allows the destination to exercise market power in pricing for that reason the tourism site under analysis must be inelastic.

Interviewees were asked to identify what makes the demand for certain tourism destinations inelastic and concluded that there are two aspects linked to it: 1) No direct substitutes, this is linked to the uniqueness of the tourism destination, the uniqueness of natural and cultural sites gives them a monopoly or near- monopoly without direct substitutes, and 2) the urgency of travel which is related to the sense of urgency within the people to visit the unique endangered destination before it disappears due to negative impacts of over-tourism. The Information Centre of the Scottish Parliament (2002) states that information and communication technologies (ICT) and the Internet has changed the distribution of tourism sales and information, the urgency to visit those unique destinations across the world is growing and it might be attributed to the increasing development of communication technologies and the Internet allowing tourism suppliers and tourists to communicate with each other on a global basis.

**Level of involvement of national environmental agencies**

**Q2:** What is the required level of involvement of government/ local authorities in implementing the new business model?
Interviewees were asked to comment on the level of involvement of national and local authorities. Adapted from Eagles et al. (2002), the level of involvement achieved by national environmental protection agencies and local authorities can be measured by their degree of management, degree of control and degree of decision-making. Tourism actors agreed that these three factors—management, control and decision-making—are present in umbrella organizations. Tourism umbrella organizations gather relevant actors at different levels and are represented in the shared decision-making process. Most communities have recognized the importance of tourism and have established convention and visitor bureaus which perform the function of an umbrella organization.

Hennessy (2009) from the University of North Carolina UNC at Chapel Hill carried out her PhD research on institutional governance and human-environment interactions, preliminary research undertaken with a team of UNC geographers and anthropologists suggests that while different governing institutions agree that there is a crisis in certain destinations, the only thing they seem to agree on about solving it is that there are too many players involved. Her work determined that an umbrella organization performs better to coordinate the work of several organizations to address a crisis.

For instance, most relevant tourism actors in the Galapagos Islands are represented by the Galapagos National Institute (INGALA) that attempts to coordinate the work of several organizations through their relationships and interactions with local island residents, tourist operators and local government representatives.

### Type of tourists

| Q3: What type of tourists would support the new business model? |

Tourism actors were asked to comment about type of tourists their relation to the success implementation of the new business model. Respondents concluded that eco-tourists will rapidly adopt the new business model which reinforces what Lindberg (2007) found through many consumer surveys: visitors who wish to enjoy and appreciate nature in all its forms without abusing, manipulating or destroying it, thereby ensuring its preservation for future generations, may be willing to pay more to achieve sustainability goals.

Two tourism destinations will be assessed by using the framework, the first destination is the Historic Sanctuary of Machu Picchu inscribed on the UNESCO World Heritage List in 1983 under both cultural and natural criteria, and the second destination is the Galapagos Islands which have been put on a list of endangered World Heritage Sites by UNESCO because of the growing pressure from tourism.

An analysis of the UNESCO’s report on the historic sanctuary of Machu Picchu from the 25th of February to the 1st March of 2002 permitted the identification of the four components proposed in the framework:
1. The uniqueness of Machu Picchu
Inscribed on the UNESCO World Heritage List in 1983 under both cultural and natural criteria.

2. Elasticity of demand of Machu Picchu
Inelastic, unique testimony of the Inca civilization

3. Level of involvement of national environmental agencies
Low degree of management, control and decision making.

4. Type of tourists
Machu Picchu attracts not only high-income but also low-budget visitors

Table 4.15: Machu Picchu and framework, results indicates a low-applicability of Sustainable Green Solution into the tourism destination.

The UNESCO considers Machu Picchu as a site of outstanding cultural and natural importance to the common heritage of humanity which gives the Inca sanctuary the monopoly without direct substitutes. An evaluation mission of the UNESCO (2002) noticed conflicts among the Peruvian authorities because unclear consensus on institutional roles and despite the Peruvian government has considered to place restrictions local tourism operators oppose any effort to regulate the influx of tourists. This shows a low degree of control and the lack of a clear framework for decision making. Machu Picchu experiences backpacker tourism and other price-sensitive tourists that might not be prepared to pay more even if they feel that ecotourism criteria are met. Based on the above analysis, innovation managers concluded that Machu Picchu does not fulfil the full criteria mentioned in table 4.6 and therefore indicates the low-applicability of Sustainable Green Solution into the tourism destination.

The second tourism destination is the Galapagos Islands which possess an inelastic demand due to its unique ecosystem with high biological endemism. The archipelago presents an umbrella organization the Galapagos National Institute (INGALA) which coordinates the work of several organizations to address the crisis associated with the rise of mass tourism.

Table 4.7 summarizes the framework that assesses the applicability of the new business model into the Galapagos Islands.
### Destination: Galapagos

<table>
<thead>
<tr>
<th>1. The uniqueness of Galapagos</th>
<th>Inscribed in 1978, the Galapagos is the first site to have been placed on the World Heritage List</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Elasticity of demand of Galapagos</td>
<td>Inelastic, unique ecosystem with high biological endemism.</td>
</tr>
<tr>
<td>3. Level of involvement of national environmental agencies</td>
<td>medium level degree of management, high degree of control and decision making</td>
</tr>
<tr>
<td>4. Type of tourists</td>
<td>High-income tourists</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Table 4.16:</strong> Galapagos and framework, tourism destination fulfils the criteria required for Sustainable Green Solution.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The archipelago hosts mostly relatively high-income tourists who are interested in the wonders of the islands welcoming any initiative that fosters sustainability in the tourism sector. The Ecuadorian government has suggested restricting tourist and resident permits as well as flights to the islands which show the high level of involvement of national authorities. The previous analysis led innovation managers to agree that the tourism context of the Galapagos Islands fulfils the criteria required for Sustainable Green Solution.</td>
</tr>
</tbody>
</table>
Chapter 5

Conclusions

This thesis consists of four sub-research questions whose answers will provide a ground to respond the main research question determining to what extent Project Beta can be modified to fit sustainable tourism market.

Sub-research question 1: What is Project Beta?

Project Beta is an innovative service that allocates scarce goods through a price-based mechanism and a secondary market. Its business model is applicable in those markets where three factors converge: 1) scarcity, 2) strong emotional bond because individuals place a great value to access to the good representing a valuable experience, Barney and Green (2002) referred as intrinsically scarce goods to those goods where these two factors meet and 3) uncertainty to the availability of a certain product or service.

Sub-research question 2: What is a sustainable tourism solution?

A sustainable tourism solution is a regulatory framework and part of a governance mechanism aiming to protect the natural and cultural landscape while minimising the adverse effects of tourism.
A sustainable tourism solution must make cultural and natural heritage tourism accessible for everyone in a sustainable manner while fulfilling the four principles- economic, ecological, cultural, community- of sustainability.
A sustainable tourism solution involves actively the collaboration of different actors in the tourism industry and should be perceived as fair with an equal balance amongst multiple actors’ interests.

Sub-research question 3: How Beta can be seen as a sustainable tourism solution?

Project Beta can be seen as a sustainable tourism solution if its business model embraces a fair allocation system with an equal balance amongst multiple actors’ interests facilitating the access to everyone in a sustainable manner.

Sub-research question 4: What is the applicability of the re-defined new business model? At this section, innovation managers will review application areas for the new business model.

If the tourism destination possesses a cultural or natural uniqueness without any close substitutes, national or local authority involvement in sustainable initiatives and awareness within the visitors on their impact on the environment the new business model
can be implemented, for instance some national parks in Africa and Asia can implement the Sustainable Green Card as part of their tourism business model.

**Main-research question:** to what extent Project Beta can be modified to fit sustainable tourism market?

The new business model in the context of sustainable tourism distinguishes itself from Project Beta by implementing a weighted lottery as the allocation mechanism.

The research reinforces the concept that STOF provides theoretical and empirical bases for an overall framework for new service development and design. As far as I am aware, no frameworks are available for identifying Critical Design Issues related to the design of new tourism business models, nevertheless the STOF model presents Critical Design Issues in business models for mobile services that were used in the design of business models in the context of sustainable tourism. I found that most Critical Design Issues were generalizable to the sustainable tourism context and offered guidelines for the design of the new business model in other sector than the telecommunication sector.

STOF might be adopted for any service provider to evaluate opportunities for delivering a new service in a rapidly changing environment. After using STOF in the design process of the new business model, I see the suitability of this framework for the design of services in a rapidly changing environment because STOF permits to gain more understanding of how a service provider is shaped by its environment and focuses on external drivers that trigger changes in the business model design. These drivers in the form of Critical Design Issues and Critical Success Factors incorporate the dynamism of the market into the business model.

The robustness of the new business model was tested by conducting a case study using the Galapagos Islands as an example. Adapted from Bouwman et al. (2008), five what-if questions were formulated and their answers provided insights into the robustness of the new business model.

For Tellis (1997) a case study is a valuable method of research where reliability is achieved in many ways. Yin (1994) presented the protocol as a major component in asserting the reliability of the case study research having the following sections: 1) an overview of the case study project, 2) field procedures and 3) case study questions, specific questions that the investigator must keep in mind during data collection, therefore the reliability of the case study in the Galapagos Islands depends on how well its protocol was designed. In this regard, objectives, issues, topic being investigated and the purpose of the case study were communicated to the participants. The field procedures involved data collection issues and was properly designed because the case study was characterized for having access to tourism umbrella organization INGALA and relevant tourism actors in the Galapagos, having sufficient resources while in the field and scheduling data collection activities.
5.1 Reflections

Priced-based mechanisms achieve economic equilibrium acting as a rationing device to equate demand with supply; however a weighted lottery use to allocate entrance permits in unique tourism destinations is preferable to an auction or any price-based allocation mechanism because it is perceived as fair by tourism suppliers and tourists.

Outstanding natural and cultural sites may be considered to be inherently scarce because the perception of the site's uniqueness depends on its relation to other destinations, for instance for some people visiting the Galapagos Island in Ecuador might have a greater value of uniqueness than visiting the Antarctic.

As more people become aware that rare cultural, historic, and natural places are being irrevocably altered or even gone forever, their interest and likelihood to visit these outstanding sites increase, the weighted lottery attempts to measure the value in having direct access to them.

The design process of this sustainable solution reinforces the concept that service innovation is only possible in an open networked environment in which multiple actors collaborate in delivering innovative services because it involved a multi-disciplinary “business model innovation team” and included tourism actors of the Galapagos Islands and innovation managers at the early stage of the process.

5.2 Limitations

A sustainable tourism initiative is not a product but rather an approach that entails great interdependency between different stakeholders and its analysis carries thus great complexity. Therefore, this research proposed a structural approach and a case study to cope with the complexity that the design of sustainable tourism solutions implies.

However, this is a limitation for the research. Due to the reduced complexity of the analysis, the sampling design and the definition of the population: two innovation managers and ten actors of the tourism sector could mean that the validity of the results is not appropriate enough.

The factor that interviews with tour operators, government representatives and environmental organizations were carried out by telephone and not face-to-face might have caused some bias displayed during the interview process and thus affected the outcome of the interview.

In order to overcome these limitations, Ecuadorian key experts in the Galapagos tourism sector were initially identified based on my personal observation during my six-month permanence in the archipelago and represented a variety of actors in the tourism sector.
The STOF method adopts a service provider perspective with a focus on realizing customer value; Company Alpha can be seen as the service provider, however the design process of Sustainable Green Solution lacks of a user-centered design approach in which the needs, wants and limitations of end-users are given extensive attention.

Many frameworks fail to accurately describe financial aspects of the business model, and although STOF model describes financial arrangements between various actors in the value network, at practical level the implementation of the new business model will require a more detailed and careful analysis of the revenue model and the cost structure.

5.3 Future research

Interviews with tourism actors and innovation managers have shown that the new business model as a sustainable tourism initiative has potential to be further explored. The results of this study can be used for Company Alpha as a prototype in other endangered destinations being the next step the implementation of this business model in the Galapagos Islands.

I consider two areas for further research: the need in determining what other sectors demand the application of the weighted lottery for allocating goods when multiple individuals have equally good claims to those goods. Adopted from World Heritage Selection Criteria, a check-list to determine the uniqueness of the destination is presented in Appendix B, however additionally research is required for implementing a scoring model based on the framework shown in table 4.6 to ensure that the assessment of the tourism destination is reliable.
Appendix A

Due to a confidentiality agreement for disclosure of Appendix A please refer to the email address: H.AlvarezAlvarez@student.nl
Appendix B

Descriptive Model, Sustainable Green Solution

The concepts of the Service domain described in section 4.5 and their relations are mapped in Figure B.1.

Figure B.1: Descriptive Model for the Service Domain
The concepts of the Technology domain described in section 4.5 and their relations are mapped in Figure B.2

Figure B.2: Descriptive Model for the Technology Domain
The concepts of the Organization domain described in section 4.5 and their relations are mapped in Figure B.3

**Figure B.3:** Descriptive Model for the Organization Domain
The concepts of the Finance domain described in section 4.5 and their relations are mapped in Figure B.4.

**Figure B.4:** Descriptive Model for the Finance Domain
Appendix C

Natural and Cultural Uniqueness of the Tourism Destination

Check-list to determine the uniqueness of the destination which is measured in two domains: cultural uniqueness and natural uniqueness. Scales for each domain are: (1) significant and (2) very significant

<table>
<thead>
<tr>
<th>Criteria</th>
<th>SIGNIFICANT</th>
<th>VERY SIGNIFICANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To represent a masterpiece of human creative genius.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. To exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. To bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. To be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. To be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. To be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. To contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. To be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. To be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;

10. To contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

<table>
<thead>
<tr>
<th>Table C.1: Criteria cultural and natural uniqueness (Adopted from World Heritage Selection Criteria)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9. To be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;</td>
<td></td>
</tr>
<tr>
<td>10. To contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.</td>
<td></td>
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</tbody>
</table>
Appendix D

STOF Model and Project Beta

The objective of this questionnaire is to identify the design issues that were critical to develop a viable and feasible business model of Project Beta within sport tournament tickets distribution.

As a starting point, what external forces influenced the business model choices? These external forces might include:

- Regulatory conditions
- Market dynamics (demand and supply factors for once in a life-time events)
- Technology drivers (shaping new tickets distribution channels)

Business model for sport tournament tickets distribution

Technology, market and regulatory developments (and others according to you) set the conditions under which business models for Sport tournaments ticket distribution has to be developed.

Critical design choices in each of the four STOF domains will be analyzed.

Service Domain (the service offering, value proposition and target group)

- What do you consider was the customer’s Previous Experience

- What do you consider the customer’s Expected value (preferences expressed by consumers)
• What is the **Intended Value** that BETA aims to offer?

<table>
<thead>
<tr>
<th>Critical Design Issues Service Domain</th>
<th>Description</th>
<th>As an innovation manager how you dealt with this?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeting</td>
<td>How to define the target group?</td>
<td></td>
</tr>
<tr>
<td>Creating Value</td>
<td>How to create value for end-users?</td>
<td></td>
</tr>
<tr>
<td>Branding</td>
<td>How to promote the service?</td>
<td></td>
</tr>
<tr>
<td>Customer retention</td>
<td>How to stimulate recurrent usage of the service?</td>
<td></td>
</tr>
<tr>
<td>Others?</td>
<td>…</td>
<td>…</td>
</tr>
</tbody>
</table>

**Technology Domain**

<table>
<thead>
<tr>
<th>Critical Design Issues Technology Domain</th>
<th>As an innovation manager how you dealt with this?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security</td>
<td></td>
</tr>
<tr>
<td>Quality of Service (performance)</td>
<td></td>
</tr>
<tr>
<td>System integration</td>
<td></td>
</tr>
<tr>
<td>Accessibility for customers</td>
<td></td>
</tr>
</tbody>
</table>

**Organization Domain**

What are the main actors in the value network of Project Beta?

What is the level of integration among actors? It refers to the level of ownership and control
Critical Design Issues
organization domain

As an innovation manager what criteria to choose among alternatives did you use?

| Partner selection
| Network openness (the degree to which new actors can join the value network)
| Network governance (dominant actor)
| Network complexity

Financial Domain

- What is the size of the market?

- What is the expected market share?

Critical Design Issues
Finance Domain

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pricing How to price the service?</td>
</tr>
<tr>
<td>Division of investment and risks How to divide the investment among business partners?</td>
</tr>
<tr>
<td>Valuation of contributions and benefits How to measure and quantify partners’ contribution?</td>
</tr>
<tr>
<td>Division of costs and revenues How to divide the costs and revenues?</td>
</tr>
</tbody>
</table>

Scenario Analysis

Possible future (developments) trends for Project Beta?

Critical Success Factors

As an innovation manager what are those “Critical Success Factors” for creating Customer Value?

As an innovation manager what are those “Critical Success Factors” for creating network value?
Appendix E

Case Study

Due to a confidentiality agreement for disclosure of Appendix E Case Study please refer to the email address: H.AlvarezAlvarez@student.nl

The case study was carried out to prove the robustness of the new business model. The main remarks derived from the analysis of the case study identified some uncertainties in the new business model.

The uncertainties that might have a potentially major impact on the viability and feasibility of the new business model are: the resistance of the umbrella organization to cap the number of visitors and the decrease in tourism demand. Nevertheless, in order to reduce the uncertainties innovation managers formulated the following strategies: raising awareness of the importance for conservation, encouraging the involvement of environmental organizations that support a cap on tourism, a communication strategy that shows the long-term benefits of sustainable tourism, raising visitor awareness of the importance that tour operators support sustainable tourism and a marketing campaign that promotes the long-term benefits of the Sustainable Green Solution.
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