Enhancement of tourism service delivery performance through value co-creation: A system dynamic approach

Case Study:
Cultural heritage sector in Sicily

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KTH Royal Institute of Technology
Department of Production Engineering

By:
Mona Soufivand
monaso@kth.se

Thesis Supervisor:
Prof. Carmine Bianchi
Università degli Studi di Palermo
Carmine.bianchi@uipa.it

Thesis Supervisor:
Dr. Ove Bayard
Department of Production Engineering
Royal Institute of Technology (KTH) in Stockholm.
Oveb@iip.kth.se
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Abstract
Value co-creation is shown to play a prominent role in performance improvement in various sectors ranging from manufacturing to service. However, its role in creating value and consequently improving the performance of service in tourist sector has not been investigated in the literature.

In order to bridge this gap, this thesis builds models aiming at developing a tourism engagement based value co-creation mechanism. It targets to improve cultural heritage sector performance in terms of service delivery system. Considering a specific case study, Sicily in Southern Italy, the developed models intend to address the tourist’s service delivery experience design. Moreover, we aim to realize the potential problems and clearly understand the relations of causal factors within the cultural heritage sector through engaging tourists and private sector. This engagement is basically governed through getting feedback and ideas from tourists.

The modelling tool used is system dynamics (SD). SD has been widely used in various fields where there are complex relationships and interactions among various actors, which are hard to analyse. Proven to be a powerful tool in analysing dynamic systems, we also employ this methodology for our analysis. Although system dynamics has been applied to a wide range of problem domains, using it in co-creating value within service delivery design especially in tourism sector is relatively new and is considered one of the main scientific contributions of this study.

One of the main advantages of SD is that it provides us with the opportunity to analyse the impacts and consequences of different policies and also the sensitivity of the system to these policies and parameters of the problem. In other words, this remarkably helps policy makers and service providers to mainly avoid the failures of policies and standards and strive for applying more efficient policies.

The benefits of using this approach in the tourist sector are twofold. On the one hand it would lead to more satisfied tourists and on the other hand governmental and non-governmental financial resources would be allocated to the different part of the service supply chain more effectively.

Given the current economic situation of Italy and its facing scarce financial resources, we need to be extremely careful to consume those resources in an effective and efficient manner. Having this in mind, our models formulate various policies that give different priorities to investment options in various areas within tourism sector including IT, human resource, infrastructure and HR skills. Using the SD simulation models we can analyse the impacts of these policies and based on the output of the models make recommendation. The main result of this thesis suggests that incorporating a value co-creation through engagement of tourists, ideation, would enable policy maker to stay in line with tourists needs and invest in accordance with their wants which leads to significant improvement in quality of the service offered to tourists. By way of the results of implementing different policies, proves that the first policy which exactly has been set in line with tourist needs is the most influential one.
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1 Introduction

In contrast with manufacturing industry, as service and service experiences are not physical objects, they cannot be possessed and stored and it depends more on people’s experiences and expectations, service industry is characteristics differently. Considering the invisibility of services, it is extremely crucial to continuously watch them out, and note that changing them may alter receivers’ perception of services. In the rest of this section we highlight more the complex nature of service and service experiences and we will elaborate on the role of ‘’value co-creation’’ and ‘’system thinking’’ in improving service experience in service supply chain sector.

Customers’ expectation is changeable and can be influenced by several factors such as Personal needs, Situational factors, Word of mouth, Past experiences etc. (Zeithaml, Berry, & Parasuraman, 1993). Thus service providers need to stay in line with the rapidly changing conditions and customers’ expectations in order to deliver decent services. In doing so, they must build capacity to operate effectively in complex, interdependent networks of organizations, customers, and systems across the public and private sector which foster the co-producing of their service supply chain value. (Larsfält, 2010)

Therefore, according to Hsieh and Yuan (2010), service providers can bring about many opportunities by designing inventive and innovative services that serve to create good customer service experiences. In designing such services, after customers’ satisfaction, time and cost saving placed as the higher importance objectives. (Subbiah & Ibrahim, 2011)
1.1 Toward an Innovative service delivery by co-creating the value

Co-creation is the process by which products, services, and experiences are developed jointly by companies, their stakeholders and final customers, opening up a whole new world of value. Public and private organizations must stop thinking of individuals as just receiver of products, services and experiences (Ramaswamy, 2009) but think as a source to create value.

Concurrent with this rapid shift from product-centric and firm-centric to personalized consumer experiences, the view of the role of the customer changes from a mere passive recipients of value to a source of business and a co-producer of value (Michel, Vargo, & Lusch, 2008).

The ultimate objective of professional service providers is to create value for the client (Dowson, 2007) and this value can be generated in many different ways. Traditional firms and organizations provide “black box” services¹ that create outcomes with minimal interaction and knowledge-sharing with their clients. By contrast, innovative firms and organizations are building knowledge-based relationships founded on collaboration and mutual knowledge exchange between operative organizations in the service system.

In this type of relationship, the outcomes include enhanced capabilities of service providers and client’s satisfaction and knowledge. To generate more value in an innovative service system, continuous collaboration with clients, stakeholders and other operative organizations seems very vital.

Reception of the greatest value from external talent requires bringing them into the firm’s processes rather than contracting for work piecemeal.

1.1.1 Importance of co-creating value in service delivery system

Based on Shostack’s research, (Shostack, 1984), traditionally the development of designing a new service is usually interpreted by translating a subjective explanation of a need into an operational concept; however, there is no systematic way to quantify the service process in order to ensure that the delivered service is rational, complete and fulfill the original need objectively. For instance in outstanding service companies, it is tried to maintain the original service idea in a very precise way. They codify the process in plenty of policies and procedures, without defining any designed process. Then in order to quantify them and make existing component more efficient, they usually use control methods² which provide managers the way to just visualize those process, while this is just a fragmental view of more comprehensive and large idea of the process.

Hence, one major element lacking is the relationship and interaction established between consumers and experienced services. It is imperative to understand these involvements as it is strongly contribute to boost the citizens’ satisfaction and other actors’ satisfaction while their expectations are fulfilled.

¹ “Black Box” is characteristic of no collaboration with clients. (Dowson, 2007)
² Such as time-motion engineering, PERT/GANTT charting, and quality-control methods derived from the work of W. Edwards Deming.
To solve this problem a less mechanical approach is needed. There must be a judgment process simultaneously with process analysis, which implies that consumers and other actors have to be involved with this analysis and give their feedback and contribute to create value.

Moreover, a systematic and dynamic service delivery design must be taken into account, which would help service providers to explore all the inherent and acquired issues with an impact on creating value.

1.2 System thinking and system dynamics

In accordance with what has been mentioned above, the experience design process is so complex and can be regarded as a dynamic and comprehensive system (Shostack, 1984). On the other hand, due to the fact that linear thinking only depends on dependent variables and could generate bias and imperfect outcomes so in order to understand and analyze the dynamic behavior of service delivery, a system thinking rather than linear thinking is highly conforming.

1.2.1 Benefits of system thinking

System dynamics and system thinking are a relatively new filed which have been introduced by Jay Forrester during mid-1950s (Jay Wright Forrester, 1961)

The capability of system thinking to cope effectively with those problems marked by complexity, multiple actors, a multitude of interactions, ineffective coordination between actors, can be pointed out as its key advantage.

Most of the problems and situations we encounter today have these characteristics and base on the fact that the traditional analysis focus on every individual pieces of the what being studied separately, the results of these conventional solutions are often poor. However, system thinking ,by focusing on how the things being studied interact with the other constitute of the system of which it is a part, creates the encouragement to prospect addressing them effectively.(Aronson, 1998) (Figure 1.2.1.1)

![Figure 1.2.1.1: System dynamics steps from problem symptoms to improvement (Jay W Forrester, 1992)](image)
1.2.2 Benefits of system dynamics

System dynamics is suited for analyzing the complex and huge systems with non-linear and multifarious relationships, which is also partially qualitative and dynamic (Sterman, 2000), so it could be a proper methodology to evaluate particular social systems like service delivery systems.

David C. Lane (1997), precisely summarizes Forrester’s approach as .. “social systems should be modeled as flow rates and accumulations linked by information feedback loops involving delays and non-linear relationships. Computer simulation is then the means of inferring the time evolutionary dynamics endogenously created by such system structures. The purpose is to learn about their modes of behavior and to design policies which improve performance…”

System dynamics is also used to comprehend the different service operation strategies and policies through simulating the system dynamics model of the situation being studied, so it would be a proper tool for service providers to obtain some insights related to the future strategies and decisions and therefore achieve their business goals.

1.3 Tourists and their dynamic behavior

Although people’s wants and desires, and consequently their quests for experiences are diverse, research shows that, (Binkhorst & Dekker, 2009), for many people in the developed areas, time spent on leisure and tourism has become an essential part of their quality of life and contribute more to happiness compared to other activities.

Nowadays, tourists are in quest of particular and enjoyable experiences which are a consequence of the alienation in everyday life. They are pursuing new destinations and new activities to quench their thirst for unique and novel experiences. Accordingly, the tourism industry to guarantee its long term competitiveness and to survive in such an environment is in constant sought for creative ideas and imaginative products/services that can satisfy their customers’ desires for new pleasant experiences. Providing inventive products/services would help tourism service operators to differentiate themselves from the rivals and take competitive advantages over those competitors who continuously offer the same and old services and products without paying attention to the tourists needs and asking for their feedbacks. (Azevedo, 2009)

As said by Shostack (1984), the lack of systematic methods for design and control the service offering on one hand and lack of subjective and quantifiable design on the other hand, which allows providers and decision makers to recognize where the system may go awry, are the main reasons of service failure.

In terms of tourism industry, in spite of the fact that it is comprised by huge number of stakeholders from different sizes, it is neither considered as an experience network in which human being, tourists, play the key role, nor is investigated as a tool for innovative and sustainable tourism development as is already done in other business areas. (Binkhorst & Dekker, 2009)
Considering **Tourism** as a network and **Tourists** as human beings operating from various experience environments, the concept of the value co-creation is very interesting to apply by implementing ICTs facilities (Binkhorst & Dekker, 2009). It is obvious that ‘‘new tourists’’ are more willing to be in charge and respond to their own travel needs and this is the foremost reason for them to consult and book through the internet.

Though these experiences tend to be expensive, people attach great value to them because they are memorable therefore, tourism industry as one of the biggest generator of experience, would be worthy of doing research on.

### 1.3.1 Importance of cultural tourism

As the specific characteristics of the tourism experience is derived from the changes in habitual time and space structure of everyday life and its tension with other realities so, Tourism-related offerings, which should be paid attention by leisure organizations and service providers, are complex products which are belongs to the different sector of tourism industry. For instance, accommodation, transportation, attraction and activities are the examples of different components of tourism sector in which visitors may face with them in new destination.(Wikiversity, 2012)(Figure 1.3.1.1)

![Figure 1.3.1.1: Main components of the travel and tourism industry](Wikiversity, 2012)
Accordingly, The results of the survey conducted by ATLAS (2007) for some touristic countries in terms of the motivation of tourists for travelling show that after taking a holiday, visiting the cultural heritage attractions is placed the first (Figure 1.3.1.2).

Moreover, showing an increase in comparison with previous surveys, almost 35% declared that visiting the cultural attractions was their most important motivation for taking the holiday (Figure 1.3.1.3).

Accordingly, Cultural heritage sector which is composed of the whole attractions of attraction and activities components has been selected as a research case of this study.

**1.3.2 How to co-create the value in cultural heritage sector?**
Taking the three dimensions of co-creation concepts into account, which has been introduced by Minkiewicz & Evans (2009), the aim of this study is to engage tourists in creating value within service supply chain. (Figure 1.3.2.1)
Visitors’ engagement is a function of how well cultural heritage sector can facilitate visitors’ involvement in getting their feedbacks and their personal experiences and produce meaningful and memorable experiences.

Sawhney, Verona, Prandelli (2005) Investigate internet as a powerful platform for enabling tourist collaboration which allows heritage organizations richness of interaction without physical proximity. Thus, using technologies such as ICTs for crowdsourcing\(^3\), enable service providers to collaborate with internal and remote intellectual capitals that would contribute towards a better work of both sides together across organizational boundaries to develop new ideas, allocate resources more effectively and create more values.

1.4 Research objective and questions

The main objective of this study is to understand how to improve the delivery of touristic services, i.e. tourism performance, according to a tourist-based perspective. This can be achieved by involving tourists in service value co-creation actions and particularly, among them, tourists as one of the main actors along this supply chain.

To do so, this study will underline practical insights by developing a framework of tourism service provision in Sicily and by relating the emerging framework to tourist ‘role’ in value co-creation processes.

As such, this study will concentrate on the following critical issues:

1. What is the current performance level of service delivery system in cultural heritage sector in Sicily?
2. How can service providers in this sector interact with each other, tourists and other stakeholders, in order to deliver the touristic services?
3. Which and how strategic resources are allocated to manage cultural heritage?

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\(^3\) “Crowdsourcing” which can be defined as the act of outsourcing a function or task, traditionally performed by a contractor or employee, to an undefined network of people using a type of open call. Today, the term is used for various notions like open innovation, user generated content, social engagement, knowledge aggregation, or prediction. Crowdsourcing can be viewed as one particular instance of co-creation, which more generally refers to the joint creation of value involving various stakeholders.”(Rosemann, 2011)
4. How effectively have these strategic resources been allocated and invested in different parts of the service supply chain?
5. What are the main limits to growth of the system at institutional, political and managerial level?
6. What systematic approaches would help service providers to generate more value through designing memorable service experiences?
7. How can service providers effectively co-create value by building an engagement platform with respect to fulfilling tourists’ expectations considering all resources limitations?
8. Which strategies and policies can be suggested to both policy makers and service providers in order to pave the path for increasing tourists in Sicily by using value co-creation processes?

1.5 Summery
This thesis builds models to analyse and develop tourists’ engagement to improve cultural heritage sector performance in terms of service delivery system. These models are based on value co-creation. Moreover, it intends to design the tourist’s service delivery experience and consequently, to realize the potential problems. It also attempts to clearly understand the relations of causal factors within the cultural heritage sector while engaging tourists and private sector in generating feedback and ideas. To do so, it employs the concept of System dynamics approach.

Sensitivity analysis through dynamic modelling helps policy makers and service providers to mainly avoid the failures of policy and standards of this sector and strive for applying more efficient policies. Consequently, on the one hand it would lead to more satisfied tourists and on the other hand governmental and non-governmental financial resources would be allocated to the different part of the service supply chain more effectively.

Although System dynamics has been applied to a wide range of problem domains, using it in co-creating value within service delivery design especially in tourism sector is relatively new and is considered one of the main scientific contributions of this study.

It would boost the development of suitable heritage places and prevent the waste of resources and discontinue negative impact of inappropriate development.

The rest of this thesis is structured as follows: Chapter 2 sets the stage by providing a comprehensive description of the problem studied. It describes Sicily’s touristic resources for tourism industry. Chapter 3 proceeds by providing a literature review. This review considers various streams of research. First, we review the notion of value creation as it has been applied in service sectors. Later, studies applying co-creation concept in tourism industry are highlighted. Since, system dynamics is the main methodology used in this thesis we briefly review the studies that used this approach to investigate tourism related subjects. Finally, chapter two is wrapped up with reviewing research related to tourism in Sicily. Chapter 4 provides a detailed description of the methodology and modeling approach we apply in this research. We characterize Causal Loop Diagrams which are the building blocks of our
simulation modeling. Next, the current and prospective situations are modeled and various investment policies are analyzed. Finally, chapter 5 concludes this thesis by providing a summary and conclusion and some recommendations for policy makers are extracted.
2 Problem Description

The Importance of tourism as a strategic economic issue, which is representative of the main source of income for residents for each country, has been widely acknowledged. Therefore, nowadays, attentions of policy makers to different branches of tourism industry, specifically cultural tourism, is increasing (Cuccia & Rizzo, 2012).

Therefore this chapter intends to conduct an explanatory case study for the cultural heritage sector of tourist supply of the particular touristic area in south of Italy, Sicily.

In doing so, it starts with the short description about the history, geographical characteristics, Image, cultural heritage and natural endowment of this Island.

Finally the most recent ranking of tourism sector in Sicily is described which is representative of the weaknesses, strengths and growing potential of this region.

2.1 History

‘The magnificence of Sicily starts with the Greek domination. The area was highly regarded as part of Magna Graecia, and Cicero describes Syracuse as the greatest and most beautiful city of all Ancient Greece.

Greek Syracuse controlled most of the eastern area of Sicily while a few Carthaginian colonies were located in the far west of the island. When the two cultures began to clash, the Greek Punic Wars, the longest wars of antiquity, erupted. Greece began to make peace with the Roman Republic in 262 BC and the Romans sought to annex Sicily as its empire's first province. In 535 AD, as the Roman Empire fell, Emperor Justinian I made Sicily a Byzantine province and, for the second time in Sicilian history, the Greek language became a familiar sound across the island.
In 965 AD, the Byzantine Sicily was conquered by Arabs who initiated a land reforms increasing productivity and encouraging the growth of smallholdings. The Arabs further improved the local irrigation systems. A description of Palermo was given by Ibn Hawqal, an Arab merchant who visited Sicily in 950 AD. A walled suburb called the Al-Kasr (the palace) is the centre of Palermo still today, with the great Friday mosque on the site of the Roman cathedral.

The defeat of Arabs in Palermo led to Sicily coming completely under the Norman control in 1091 AD.

Under the Normans, Roger II of Sicily was ultimately able to raise the status of the island to a kingdom in 1130 AD, along with the other holdings of the Duchy of Apulia and Calabria and the Maltese Islands. During this period the Kingdom of Sicily was prosperous and politically powerful, becoming one of the wealthiest states in all of Europe.

Later, after the Napoleonic Wars, Sicily and Naples formally merged as the Two Sicilies under the Bourbons who ruled the kingdom from Naples until the revolutionary movements occurred in 1820 and 1848. The 1848 revolution was successful and resulted in a period of independence for Sicily. It is right in this period that the Mafia, a loose confederation of organized crime networks, grew in influence and the Fascist regime began suppressing them in the 1920s with some success. Sicily is today an autonomous region of Italy.’’ (Provenzano, 2009)

### 2.2 Geographical Position and Characteristics

‘’Located in the South of the country, just off the toe of the Italian peninsula, Sicily, with its total area of 25.711 square kilometres and a land area of 25.409 square kilometres, is the most extended region in Italy and the widest island in the Mediterranean.

Thanks to its position at the heart of this renowned sea, it has always represented a bridge between the European continent and Africa, from which it is separated by the Strait of Sicily, a 140 km stretch of sea.

The regional land is 61% hill, 25% mountain and 14 % plain. The north is mainly mountainous, the central-south area is mainly hilly, the south-east is typical of the highlands (the Ibleo plateau, for instance), whereas the north-east section of the island is characterized by the mountain chain of the highest active volcano in Europe, Mount Etna, which rises 3.350 meters over the sea. Plains are mainly located near the 1.483,9 kilometres of coastline.

With these morphological characteristics the Region features a stunning variety of constantly alternating landscapes, providing a distinctive uniqueness to each part of the island.

Sicily is also known as the “island of the sun” for its particularly mild climate. In fact, its winters are generally mild, with temperatures rarely dropping below 7-8°C, while the summers are long, hot and dry.

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4 Source: EUROSTAT
Sicily is inhabited by 5,016,861 people, 1,242,300 just in Palermo (the capital), with a density of 197.7 people per square kilometre.

Agriculture is the chief economic activity but has long been hampered by absentee ownership, primitive methods of cultivation, and inadequate irrigation.

The main agricultural products are wheat, barley, corn, olives, citrus fruit, oranges, lemons, almonds, wine grapes, and cotton; cattle, mules, donkeys, and sheep are raised.

In the last decades the wine industry has had a strong improvement and Sicilian wines, first of all Nero d'Avola, have become famous in many important countries, such U.K., U.S.A., Canada, Germany, Russia and many others.

There are also important tuna and sardine fisheries. Sicily's manufactures include processed food, chemicals (in the area of Catania), refined petroleum, fertilizers, textiles, ships, leather goods and forest products. There are petroleum fields in the southeast, and natural gas and sulphur are also produced but they are mainly managed by foreign companies.

The tertiary sector in Sicily lacks strong intervention projects with road and railway system being the main issues to face as soon as possible.” (Provenzano, 2009)

2.3 Cultural Resources

‘Sicily still today shows traces of the many cultures that ruled over the centuries: the Greeks, Romans, Arabs, Normans, French and Spanish each made their mark, leaving important testimony of their presence through artistic and architectural works of the highest level.

As a matter of fact, Sicily is among the Italian regions with the biggest endowment of archaeological resources. With its 70 museums/antiquaria5 and 65 parks/archaeological sites 6, Sicily ranks just after the region of Lazio that counts 162 resources in total (74 museums/antiquaria and 88 parks/archaeological sites). Bizarre though it may sound, tourists can enjoy some of the most beautiful Greek temples and amphitheatres right there in Sicily instead of looking for them in Greece.

UNESCO has recognized 5 historical-cultural sites of Sicily as part of the World Natural and Cultural Heritage Registry: the archeological area of Agrigento, the Roman Villa of Casale (Piazza Armerina), the baroque cities of Val di Noto and Palazzolo Acreide, the Aeolian Islands, Syracuse (Siracusa) and the cliff top Necropolis of Pantalica.

In addition, the great quantity of castles, “Dimore d’Epoca (Period Homes), villas, aristocratic residences, monumental noble buildings, churches, ancient convents, cloisters, monasteries, theatres and art galleries makes of Sicily a peerless melting pot of history and art able to satisfy the taste of the most sophisticated cultural palate.

5 Antiquaria is the plural form of the Latin word antiquarium.

6 A complete and updated list of antiquaria, archaeological sites and museums in Sicily can be downloaded from the web page of the Assessorato Beni Culturali, Ambientali e P.I. – Dipartimento Beni Culturali, Ambientali ed E. P. www.regione.sicilia.it/beniculturali (in Italian).
But culture in Sicily also consists of a series of rituals, events and shows that take place in every part of the Island throughout the entire year. The Christmas and Easter celebrations (in Agira, Custonaci and Trapani the former, in Alto Belice Corleonese still celebrated in ancient Greek the latter), the Carnival (in Sciacca or Acireale), the patronal feasts (Saint Rosalia in Palermo, the Vara in Messina, Saint Agatha in Catania), the flower feast in Noto (Siracusa), the Staircase Illumination in Caltagirone (Catania), the Almond Blossom Festival in the Valley of the Temples in Agrigento and the medieval race of the Normans in Piazza Armerina (Enna) are just a few examples.

The summer season of classical productions of Aeschylus, Sophocles and Euripides performed in the characteristic settings of Greek theatres (Siracusa and Segesta, to name the most famous), and the cinema and contemporary art festivals held on a yearly basis in the magnificent backdrop of the ancient Taormina Theatre complete the cultural supply of Sicily that allows the tourist also to experience a trip in the history in the range of several kilometers.”(Provenzano, 2009)

2.4 Natural Endowment

‘‘If Sicily’s cultural endowment has no fear of comparison with the other Italian regions and main tourism competitors, the supply of a nature-based holidays in Sicily has to face the foreign and national competition instead.

At a national level, the regions of Sardinia and Calabria deal on the holiday market with the same, or even higher, quality of beaches whereas Trentino, Val d’Aosta, Lombardia, Tuscany and Calabria have a heritage of mountains and “green” resources definitely higher than the Sicilian one.

Sicily nowadays offers a wide array of natural parks, nature reserves, river parks and other protected natural areas for a total of 271.004,51 ha of protected land and 78.569,00 ha of protected sea.

The forest area has not shown substantial variations increasing from 221.044 ha in 1998 to 223.993 ha in 20057.

Etna volcano, as angry and unreliable it may look with its constant bubbling and roaring activity, is always something to marvel at for its natural wonder.

An example of a unique and uncontaminated landscape is the archipelago of the Aeolian Islands (from Aeolus, the God of the winds of Greek mythology) composed of seven islands that form a pattern resembling the letter “y” along the north-eastern coast of Sicily. These islands have been called the “seven pearls of the Mediterranean”, due to their extraordinary charm, their volcanic origin (Stromboli is an active volcano), the white mountains of pumice (Lipari) the hot, sulfurous mud baths (Vulcano), the characteristics capers and Malvasia wine (Salina), the utmost relaxation, unspoiled nature and splendid landscapes (mainly Alicudi and Filicudi) and last, but not least, the night life (Panarea).

---

7 Source: ISTAT
The pristine and splendid Sicilian sea with its 99.27% of bathing area (the Italian average being 92.00%), the very good locations for diving and the exploration of the remains of ancient crafts, the richly colourful underwater vegetation and a flourishing fauna protected by UNESCO complete the naturalistic panorama of Sicily.”(Provenzano, 2009)

2.5 The reputation of Sicily

“...There are those who are frightened by Sicily’s reputation for crime, and those who think it is fascinating or, indeed, glamorous. Neither view bears much relation to the reality of modern Sicily.

The three Francis Ford Coppola Godfather movies (the last in 1990), the popular television series entitled La Piovra (the Octopus) broadcast in Italy and abroad between 1984 and 2001, the more than 1,000 deaths in Sicily in the early 1980s’ internecine war between rival Mafia families, the assassinations of anti-Mafia judges Giovanni Falcone and Paolo Borsellino in 1992, the electoral victory of Salvatore Cuffaro (on trial for complicity with the Mafia) over Rita Borsellino (the sister of Paolo Borsellino) for the presidency of the Sicilian region in 2006, and decades of headlines and court cases, attest to the presence in Sicily of organized crime. Shrouded by secrecy, protected by blood-oaths, murders and bribery, the Mafia (or Cosa Nostra) has long exerted its hold over Sicily, particularly over Palermo and the western half of the island.

The last couple of decades, however, have seen an unprecedented openness, as Italy attempts to come to terms with its legacies of criminality and bloodshed. In a series of mass trials (including those of former Italian Prime Minister Giulio Andreotti), the act of facing up to these legacies began. After extensive police operations, most of the heads of Mafia families in Sicily have been arrested, and several others are being hunted down. People in Sicily have begun to denounce the blackmail, extortion and threats they have been subjected to, abandoning the practice of omertà (silence) that for years allowed the Mafia to enrich and entrench itself.

Yet, no one could ever say that the Mafia is going to disappear. Defeating the Mafia is a slow process, with major obstacles to overcome. Surely, the growing effectiveness and timeliness of the latest law enforcement actions have put a severe strain on the Mafia’s ability to regroup and reorganize, resulting in a decreased level of danger posed by Cosa Nostra, and a decrease in the perception of that danger at local, national, and international levels.”(Provenzano, 2009)

2.6 Tourism in Sicily

As it is mentioned by D.Provanzano (Provenzano, 2009), Sicily follows the below ranking (Figure 1.3.2.1) in which the survey was carried out for fifteenth report on Italian tourism.

---

8 DOXA, Mercury and Touring Club Italiana, Mercury (2006), XV Rapporto sul turismo italiano (fifteenth report on Italian tourism),
intended for identifying the most important parameters of tourism attractiveness in Italy. (See Table 2.6.1)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Parameters descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd</td>
<td>Sea and the beauty of coasts</td>
</tr>
<tr>
<td>3rd</td>
<td>Cuisine and wines</td>
</tr>
<tr>
<td>1st</td>
<td>Welcoming nature, culture and charm of its inhabitants</td>
</tr>
<tr>
<td>3rd</td>
<td>Local lifestyle</td>
</tr>
<tr>
<td>4th</td>
<td>Affordability of a vacation</td>
</tr>
</tbody>
</table>

Accordingly, these positions imply on an inherent potential of Sicily to boast a high qualified tourism market. However, in terms of tourism presence it is placed at the tenth Italian region (among twenty in Italy) and the second in the Southern Italy (Provenzano, 2009).

Moreover, in spite of the richness and variety of its cultural heritage sector, coasts of this Island are still the most important parameters of its attractiveness and the region is mainly perceived as ‘sun, sand and sea’.

### 2.6.1 Tourism Policy in Sicily

The research results of Kudo (2012), imply on the lack of intergovernmental coordination between the region and the local government which consequently leads to the weak coordination among implemented policies and sometimes contradictions between them. Lack of coordination in regional level seems to be the major cause of this incoordination. In terms of tourism sector, this poor coordination refers to tourism promotions policy and cultural policy including cultural heritage management and environmental policies. As such, many cultural heritages and natural reserves are in risk and vis-à-vis some tourism promotions are stuck. In order to promote these policies the coordination among the region and municipalities also must be taken into consideration.

Since most of the municipalities are very small in its population, they have some limitations of budget, number of staff, number of expert staff, and institutional support. In spite of the huge amount of European Funds which has been allocated to the region, however, the evaluation analysis of their impacts on its territories is not positive.

- Many of infrastructures which has been created by these funds are not fully utilized
- Many of training courses are often, without giving knowledge and information, used only to give youngsters temporary ‘occupations’

### 2.7 Conclusions

This discouraging data, nevertheless, could be interpreted as the possibility for service providers in order to develop and improve tourism business in this area. Thus, contribution of tourists by getting feedbacks, in order to co-create value in the tourism value network, would be a key factor to boost the considered development. In this context, a Consumer-Oriented
service experiences design to involve tourist as a receiver of touristic services is indispensable.

Having all said above, in order to change the wrong perception about this island and consequently develop the tourism sector in this region, putting more effort in cultural heritage sector seems to be very vital which gives the incentive to the study to choose this sector as a case which is supposed to be investigated.
3 Literature review

3.1 Service experience and value co-creation

As Ramaswary and Gummeson state, new domains in service science scope are opening up concepts like ‘relationship management’, ‘cooperation’, ‘collaboration’, ‘innovation’. This alerts new opportunities associated with co-creation of value (Ramaswamy, 2004 & Gummeson, 2004). Therefore, given the chance to look further on service delivery scope and its achievement, it certainly implies transformations of conventional view of service delivery.

As Pine and Gilmore (1999) explain: “When a person buys a service, he purchases a set of intangible activities carried out on his behalf. But when he buys an experience, he pays to spend time enjoying a series of memorable events that a company stages – as in a theatrical play – to engage him in a personal way. Evidence for this trend in innovative hospitality and tourism products/services is the surge in the building of themed hotels, themed restaurants and themed cruises that immerse their guests into new imaginative experiences based on some central themes such as geographical location, culture, time period, activities, etc.’’

Stuart and Tax (2004) noted that ‘’service providers should find out a critical approach to design a new service which can enable customers to achieve delight and loyalty. The most importance is that service providers should deliver excellent services for customers with pleasant and memorable experiences by designing good customer experiences. Consequently, customer experiences can be divided into several service segments, so experience design can be composed of a series of service design.’’

To do so, Boswijk, Thijssen, and Peelen( 2007) describe a need for the creation of meaningful and specific value for individual consumers through personal interaction with the company.
In the experience space, the individual consumer is central and the involvement of the individual influences that experience. The personal meaning derived from the co-creation experience is what determines the value to the individual’. (Ramaswamy & Prahalad, 2003)

"Value co-creation is a form of collaborative creativity that is initiated by firms to enable innovation with, rather than simply for their customers” (Roster & Samson, 2009)

In Ramsawamy’s opinion, ‘‘Value Co-creation is a “win more – win more” approach to value creation (in contrast to “win-win” collaboration) that opens up new sustainable growth, business advantage and innovation opportunities’’ (Ramaswamy, 2004).

Regarding Innovation in service design, Norman believes that ‘‘Innovation, within the context of value constellations and customer communities, is less likely to occur linearly through value chains but rather it emerges dynamically from newly created value constellations’’ (Norman, 2001). Concurrent with considering dynamically concept in value creation, the whole designing process has to be considered as a system. As Fowler stated that ‘‘systems thinking are a framework for managing the strategies, operations, and implementation of comprehensive and diverse systems’’ (Fowler, 2003).

Spohrer also mentioned that ‘‘Service systems are dynamic value co-creation configurations of resources (of the four logical types mentioned previously, i.e., people, organizations, shared information, and technology) ‘’(Spohrer, Anderson, Pass, Ager, & Gruhl, 2007).

Owing to the fact that human behaviors is influenced by time and context factors, Forrester proposed System dynamics, as an analytical tool to propose a macro viewpoint to analyze the nature of problems and raise the capability of solving problems. (Jay Wright Forrester, 1994)

In doing so, Sedehi offered a basic approach to the problem of evaluating a tourist enterprise in the first international conference of system dynamics society. (Loutfi & Moscardini, 2000) also analyzed the economic impact of tourism revenue on the 21 Egyptian economy using classical tourism multipliers. ‘‘They concluded about the opportunity to carry out tourism analyses mixing traditional econometric methods with System dynamics models.’’ (Provenzano, 2009)

In terms of Tourism Industry, Binkhorst and Dekker (2009) stated that ‘‘Inspired by the ethnographic perspective, both from a fundamental research point of view and supported by an increasing need for, and interest in, innovations based on ethnographic or ‘people research’ among businesses, it is argued here that the concept of co-creation deserves to be taken seriously.’’ But as and Dekker described, Tourists are rarely included as partners in the process of designing the tourism experience beforehand, reporting about it during the experience of it, or evaluating it afterwards. Only few examples of co-creation with tourists can be found (Binkhorst & Dekker, 2009).

Nonetheless, Tourism expectation as a strategic option for leisure organizations in order to generate the unique, memorable experience and intangible differentiation has been
considered. As it can be seen in some previous research such as Lo et al. (2005), which proposed a customer-based supply chain management framework based on customer expectation by the Delphi and interview methods.(Lo, Sculli, A. H. W. Yeung, & A. C. L. Yeung, 2005). Besides, Kurtz and Clow (1993) analyzed that the restaurant services influenced customer expectation by the survey method.(Clow & Kurtz, 1993)

In addition to aforementioned research, although tourism can be counted as one of the growing and developing sources of experiences, however, According to Morgan and Pamela (2007) ’’there has been relatively little in-depth research into the experience of tourists, and the research that has been undertaken has been focused primarily on consumer behavior and consumer marketing’’. For instance, it is observable that Ramaswamy and Prahalad (2003) already pay attention to the co-creation experience environments in a variety of realms, while, tourism as one of the greatest experience generators is not mentioned.

’’The lack of effective tourism planning that includes market appeal, economics factors and conservation policy/assessment is evident in the way many cultural heritage place are managed around the world. Such heritage places often require commodification to enhance the visitor experience and actualise the tourism potential.’’(Cros, 2001)

3.2 Studies about co-creation in tourism

The thesis work of Mattila (2011) in ST. Lapland is the only empirical work that address the value co-creation concept in tourism sector. The object of study is to develop new tourism products and redevelop the existed tourism product package to create memorable products and improve the tourism flow. To reach the goal, observing and interviewing are the tools that had been used to get the ideas and comments and thus to co-create the value with actors such as tourists’ operators.

In addition, Minkiewicz & Evans (2009), considering holistic nature of co-creation, by developing three dimensions of co-creation, personalization, engagement, co-production, conceptualize the co-creation experiences in heritage sector. By doing so they moved beyond value co-creation and focus on experiences co-creation. Engaging visitors would help to co-produce the service experiences rather than value co-creation. National gallery of London, increasing the level of engagement of the online users, enable them to co-create their own experiences. offers its online visitors the ability to review each painting in incredible detail using its Zoomable Pictures facility and enables printing of pictures from its permanent collection on demand (Bartak, 2007).

For example, the National Gallery of London, which has been a leader in the application of on-line technology, had not only digitized its entire collection by 2000 but offers its on-line visitors the ability to view each painting in incredible detail using its Zoomable Pictures facility and enables printing of pictures from its permanent collection on demand (Bartak, 2007). The visitors ability to experience the service in any place at any time may be said to increase their level of engagement in the co-creation of their own experience.
### 3.3 Studies about system dynamics approach in tourism industry

A basic approach to the problem of evaluating a tourist enterprise was presented in the 1th system dynamics society conference by Sedehi (1983). Using classical tourism multipliers and system dynamics models, Loutfi & Moscardini, (2000) analyzed the economic impact of tourism revenue on the Egyptian economy.

A system dynamics structure for snowmobile tourism in the Keweenaw Peninsula was proposed during the 19th international system dynamics society by Jambekar & Brokaw (2001). Their studies ended up with a preliminary conceptual framework to build a simulation model in order to support the system-based inquiry for this specific snowmobile destination.

As the first attempt to present a complete system dynamics model to understand the effect of several external policies to obtain more international tourists, the work of Honggang & Jigang (2000) must be take into account. The study focused on Guilin.

Besides, in 2003 Georgantzazas with the aim of evaluating the Cyprus’ hotel chain present a system dynamics simulation model within the island’s tourism customer-supplier value chain.

The paper work of Lewis (2007), also present a system dynamics-based tourism model. The paper mainly focuses on the dynamic interdependencies between hospitality sector, labor sector and the manufacturing sector. The model has been developed to incorporate a generic value-chain structure which allows modeling the tourist-supplier value chain.

### 3.4 Tourism studies in Sicily

Following the vital indicators of the development of sustainable tourism, Santonocito (2009) offered theoretical basis in this regard and describe the initiative which were taking place in Mediterranean area focusing on Sicily.

Moreover, Cuccia & Rizzo (2012) addressed the beneficial effect of cultural tourism in Sicily to reduce the tourism flow seasonality in Sicily and finally explored how different institutional arrangements are able to contribute positively contribute in this direction.

With a dynamic approach, the most important determinants of tourism flow in Sicily has been presented in the work conducted by Provenzano (2009). Formulizing the relations in the economic model, gravity functions, enables him to investigate the tourism demands within a dynamic environment.

Having all said above, none of the studies integrate these three major concepts, "Tourism" & "System dynamics" & "value co-creation", which have been addressed in this study.
4 Modeling and Analysis

4.1 Methodology

System dynamics is a computer-aided approach for analysing and solving complex problems with a focus on policy analysis and design. Initially called ‘Industrial Dynamics’ (Jay Wright Forrester, 1958)

Modeling the process of customer experience design, by using causal loop diagrams and stock and flow diagrams, based on the simulation results of system dynamics, helps service providers to analyze the impact of feedback and time delays on customer experience design in which increase the efficiency of strategic decisions and also enhance the viability of implementing them in future practices and allows developers to work out details ahead of time.

As explained in previous parts, System Dynamics is the implemented method in this study to answer the research questions which follow the phases of the demonstrated flowcharts in below (Figure 4.1.1).
4.2 System Identification
This study intends to establish the customer service experience design model and consequently to realize the potential problem and clearly understand the relations of causal factors within experiences design in tourism sector. To do so, it employs the concept of System dynamics.

4.2.1 Causal Loop Diagram (CLD)
Causal loop diagrams depict the relationships between entities and the feedback processes of the system. Feedback processes mainly refers to the closed loop of causal effects.

Given the ability of CLDs in addressing dynamic and complex systems, it has been considered as a proper analytic tool for this study and this section is going to present the developed causal loop diagram of the service delivery in cultural heritage sector to better understand the process of tourism service experience and find the causes and problem of this specific service system. The model illustrates the major loops that can affect the performance of service delivery system to pave the path for quantitatively exploring the critical decision factors that significantly influence the performance management. The diagram depicts the general overview of the traditional relations in managing cultural heritage sector (Figure 4.2.1.1). Several loops will be identified and characterized in the rest of this chapter.
CLD is used to represent feedback process around the central topic of interest. On the other hand, owing to the fact that the ultimate goal of service provider is to satisfy the tourist as much as they can so this diagram was developed based on two main variables as the central topic of CHM’s interest, tourists’ satisfaction and number of tourists, which are considered as the main gauges of measuring the performance in cultural heritage sector.

The arrows between two variables denote an existed relationship between connected variables. However, the nature of these relationships is shown by the minus or plus sign as follows:

\[ Y \xrightarrow{+} X \quad \frac{\partial y}{\partial x} > 0 \quad \text{and} \quad Y \xrightarrow{-} X \quad \frac{\partial y}{\partial x} > 0 \]

Those arrows labelled by plus sign show that the first variable causes a change in the same direction in the second variables, while arrows labelled by minus sign used to signify that a change in the first variable causes the change on the second variable in the opposite direction.

In CLDs arrows come together to form a loop which is called feedback loop and can be labelled by R or B. Feedback as a key concept in use of system diagrams has to be taken into consideration to analyse the system.

### 4.2.2 Feedback loops: Balancing and Reinforcing

In terms of feedback loop’s nature and sign two types are defined as follows: “R” or “+” stands for “Reinforcing Loop” meaning that the casual influences between variables...
aggravate the impact of a change within the loop and generates the exponential growth or collapse. Positive feedback loops might consist of even negative relations (arrows with minus sign) (Figure 4.2.2.1).

Figure 4.2.2.1: Examples of Reinforcing Loops

“‘B’ or ‘-‘ stands for ‘Balancing Loop’ meaning that the causal relationship of variables in the loop alleviate the effect of changes through the loop and keep the effect in equilibrium. Negative feedback loops, in contrast, are composed of negative arrows (Figure 4.2.2.2).

Figure 4.2.2.2: Examples of Balancing loops

The current service supply is composed of 17 loops (4 Reinforcing loops & 13 Balancing loops) as follow:

Reinforcing Loops:
Balancing Loops:

Balancing Loops:

Balancing Loops:

Balancing Loops:
Since the number of tourists is affected by tourists’ satisfaction, we start with adopting the model of customer satisfaction developed by Parasurman, Berry, & Zeithaml (1991).

First, a thorough description of all the variables incorporated in the model is provided as follows:

- **Tourist expectation and perception of service quality**

According to Voess and Zeithaml, (Voss, Roth, & Chase, 2008) & (Zeithaml et al., 1993), in terms of designing the service experience delivery, the concept of customer expectation and customer perception play the important roles. It is because the customers’ satisfaction is derived from the difference between their expectation and their perception of the services which are delivered.

In this study tourist expectation refers to their desires within their mental mind and as Zeithaml et al., (1993) mentioned expectation determinants are changeable and can be
influenced by several factors such as personal needs, world of mouth, past experiences and situational factors.

In contrast, their perceptions refer to the experiences in which they get from the actual service in practice.

- **Tourists satisfaction and Gap**

Once the tourists faced with the specific services, they start to judge the quality of the delivered services and compare them with their expectations. This would lead to form a gap which is the representative of the level of their satisfactions (Depicted as a yellow circle in Figure 4.2.1.1)

The bigger is the gap, the lower is the satisfaction they can have and vice versa. As such, Any increase in service quality leads to higher tourists’ perception and consequently the gap would decrease and the level of satisfaction would rise.

- **Enjoyable Infrastructure, Employee Quality, Number of Human resources and IT facilities**

As it is shown in the picture (Figure 4.2.1.1), perceived service quality, as a core element of service system directly has a significant impact on the gap between tourist expectations and their perception. While the service quality get better the gap becomes smaller (Hsieh & Yuan, 2010).

Tourist can easily obtain excellent and memorable service experiences, if the service operations be well implemented to fulfil their actual needs (Donovan & Rossiter, 1982). The atmosphere that can be built by service operations contains some critical elements and just the major ones such as quality and quantity of infrastructures, employees’ quality, number of employees and information and communication technologies have been considered in this study.9

- **IT facilities:**

A key capability that the Government will develop is in business analytics. With the ever growing volume of digital data collected through computerisation over the years, equipping public officers with the right tools and competencies in business analytics will allow them to generate intelligent insights to enhance agencies’ performance and improve service delivery and policy formulation.

However, on the one hand, using ICTs require a large budget for designing, piloting and implementing of the system. The main areas of investment are the procurement of hardware, ware, communication network, user and operators training activities, system operation, and maintenance (Thi, Tam, Navarra, & Tuladhar, 2010).

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9 These four indexes are derived from comments of tourists, through different websites such as Tripadvisor.com, Slowtra.com, etc. after their traveling. As an example: http://www.slowtrav.com/italy/sicily/pm_traveling.htm
- **Enjoyable Infrastructures and Public services:**

In spite of the fact that Sicily is increasingly popular because of its cultural resources and infrastructure, natural endowments and etc. (See chapter 2), there are some sites and cultural locations which are still closed and are not back to the public enjoyment. Although because of the increased tourism demand for these resources, there has been a greater attention paid towards the exploitation of the cultural heritage of Sicily, still lack of care to restore and maintain them can be observed.

- **Number of employee and their skills:**

These variables refer to the quantity and quality of workers in this sector. In terms of quantity, the number of employees working in front-line is a big issue for tourists and they do not care about how many employees there are in back-office. As an example, number of available tour guides has a big effect on their perception of delivered services.

Regarding the quality, how well skilled are the front-line employees would have an impact on tourists satisfaction. For instance, the more knowledgeable tour guides who are fluent in English and other languages positively increase tourists, satisfaction.

- **Investment and Investment Policies**

This variables indicates how financial resources are assigned to the different investment areas. A bigger share of liquidity to be invested in tourist sector can lead to an increase in service quality and perceived quality of services if it is implemented effectively. Therefore, it is crucial for decision makers and managers to understand how and when they must invest in different areas. Thus, by applying different investment policies they would realize how to improve the quality of services.

- **Liquidity**

Certainly, service providers need enough budgets to invest in their service operation settings and their capabilities. In cultural heritage sector, this amount of money is provided by the national government, European organizations such as UNESCO and the tourists’ expenditures in this specific sector such as the fees they pay for entrance tickets.

As it is depicted in the diagram, the aforementioned funds are not fixed but variable and are dependent on some indexes such as number of tourists and the existed gap.

- **Financial transfer from regional administration and government and Financial Transfer related to submitted project to EU**

The amount of these resources depends on different factors. Sometimes the reasons are fixed, for example in order to maintain cultural resources, every year this sector receives some money from national administration or there are some specific resources which are exclusively assigned for facilitating the libraries.
- **Revenue from ticket sales**

All cultural assets like museums, heritage theme parks, etc. relying on gate fees benefit from increased visitation. Hence, more tourist satisfaction leads to a higher number of tourists and consequently larger financial resources from ticket sales. This enables the service providers to enlarge their investment in order to reduce the gap.

- **Effect of Time Delay (l)**

As it has been mentioned before, time delay is one of the two main features of dynamic systems. It represents a time interval between the time when the input is changed and when it influences the output of the system. To be more specific, according to the CLD of this study, once service providers figure out that having more tour guides with good treatment skills would foster their capabilities, they start to set the goal on investing, hiring and training more staff. This definitely would not happen immediately and takes some time.

The same holds when we consider liquidity as a crucial issue for implementing project and finalized policies. Usually, there are some delays in funding process which are caused by political stagnation or by ineffective managing procedures. (Kudo, 2012)

- **The green dashed line**

Undoubtedly service providers with the high level of capabilities are able to effectively and efficiently carry out service operations and cope with tourist expectation. To get such capable, enjoyable infrastructure, skilled and expert employees and consultants, high IT facilities and service quality are required.

At the heart of a Collaborative Government is an effective and innovative workforce operating in an environment that supports inter-agency collaboration empowered by ICT. To achieve this, the Government will build on the foundation established by past e-government efforts to transform the public sector ICT infrastructure, services and capabilities.

*Figure 4.2.2.3,* represents the same interactions with the respect to Co-creation concept, when tourists are asked to contribute to create value, with intention to redesign a service system based on tourists’ feedback and ideas.
Although in an ideal CH system in which the value is co-created, cooperation and collaboration between all involved stakeholders, tourists and service providers is necessary for co-creating the sustainable value. However, in order to avoid complexity, the co-operation between only service providers and tourists has been considered in this system analysis.

4.3 System Modelling

Although System dynamics has been applied to a wide range of problem domains, using it in co-creating value within service design especially in tourism industry is relatively new. Therefore, applying this approach enables Policy makers to select an appropriate strategy in order to cope with the aforementioned risks and opportunities that grow out of such a complex and dynamic environment.

This section is dedicated to the simulations of both the current situation and suggested new design of this sector for future. All the simulations have been conducted in Powersim software.

4.3.1 Simulation Design

After validating the models, they are run for 8 years (2012-2020) and the time step has been set for 1 month.

Simulation processes in this study includes 3 different steps as explained below.
• Firstly, the model is run for current situation as a base and benchmark scenario (See 4.3.2).
• Secondly, six other simulations were conducted each one representing a policy to be implemented in the future. As it can be found in section 4.3.3, a major change has been made in the structure of the model to incorporate suggested e-engaging part of the system. This basically revolves around the notion of value co-creation. These six simulations are corresponded to the six different possible investment policies, which are assumed that decision makers in this sector may take into account (See 4.3.3).
• Thirdly, through sensitivity analysis the effects of applying different investment policies on the simulations results are going to be expressed and compared with the current investment policy. This is done in order to better understand which policy has the highest influence on the simulation results and could cause improvements (See 4.4).
When it comes to verification of the numerical values assigned to some parameters, we should note the most accurate data come from the high-quality information service databases provided by the local, national and international statistical offices. Some data are the result of personal elaborations of official data and some others have been personally collected. Nevertheless, it has to be kept in mind that System Dynamics models generally describe not only physical relationships for which hard data are available, but they often include data on “soft” relationships that are unlikely to be present in any database, even in a developed country. (Provenzano, 2009)

For instance in this study, all “Effect” variables as in the few others have been estimated using common sense.

During all simulation procedures, following parameters have been taken into consideration as the most important indicators of the systems behaviour.

- Quality
- Tourists Satisfaction
- Gap
- Number of tourists in Sicily
- Liquidity.

4.3.2 Modelling of the Current situation

Regarding the complete structure of the current situation of the system, in terms of stock and flow, the model is constructed as it is depicted below (Figure 4.3.2.1)\(^{10}\)

\(^{10}\) Magnified version can be found in Appendix 1
2011 is considered as the reference point of time when we develop the model of current situation.

After subtracting the total wage of employees from the liquidity, the sector conventionally would plan to invest the rest of the liquidity in different areas.

According to the annual report of expenses\(^{11}\) of this sector in 2011, some assumption for traditional investment policies are listed as below (green circles). (Table 4.3.1)

<table>
<thead>
<tr>
<th>Investment areas</th>
<th>Investment policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invest in new IT equipment</td>
<td>20% * Investment</td>
</tr>
<tr>
<td>Invest in hiring new employees</td>
<td>35% * Investment</td>
</tr>
<tr>
<td>Invest in human resources’ skills training</td>
<td>25% * Investment</td>
</tr>
<tr>
<td>Invest in Infrastructures and public services</td>
<td>20% * Investment</td>
</tr>
</tbody>
</table>

Each area with the certain delay has the different effect on quality of the system. The delay sign in the model is depicted by \(\bigtriangledown\). The time delay after investing in each area has been specified as follows:

<table>
<thead>
<tr>
<th>Investment areas</th>
<th>Time delay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invest in new IT equipment</td>
<td>1 year</td>
</tr>
<tr>
<td>Invest in hiring new employees</td>
<td>1 year</td>
</tr>
<tr>
<td>Invest in human resources’ skills training</td>
<td>6 months</td>
</tr>
<tr>
<td>Invest in Infrastructures and public services</td>
<td>5 years</td>
</tr>
</tbody>
</table>

Here is a larger snapshot of various investment areas of the system (Figure 4.3.2.2).

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\(^{11}\) All the expenses can be downloaded from:
IT area:

After allocating 20% of available liquidity to IT sector, service providers try to acquire different types of the new IT equipment for different purposes. The acquisition rate of the new equipment is defined as the amount of *IT investment* divided by *AVG cost for providing new IT equipment*. Stock of *IT equipment* is the representative of the accumulated and existed IT facilities in this sector. The rate of obsolescence of the IT equipment is calculated in the *obsolete equipment* as the number of actual *IT equipment* divided by *obsolescence time of IT equipment*.

Presence of this equipment in the system has an effect on the system productivity and consequently the quality of the services. This effect, *effect of IT equipment on quality*, is defined as a function with an ascending trend, meaning that higher levels of IT facilities in the system would foster quality improvement.

Skill training of human resources area:

Spending 25% of the investment on training of the employees used to be done as a way to improve the quality. To reach the high quality in this area through having skilled employees, an *Expected investment in HR skills* has been considered. This constant contains the maximum amount of investment for ideally training the human resources. This would lead to form a gap, *Gap in HR Skill*, which is the ratio between actual *HR skill investment* and...
Expected investment in HR skill. The calculated ratio then is the input for HR Skill which is the non-linear and rising graph function and the output variation is consistent with the Gap in HR Skill and it has been defined between 0 and 1. As training is a time consuming processes, an average six-month time delay is considered by denoting a constant number called Time to change HR skill. Calculating the difference of actual HR skills and HR Skill over Time to change HR skill, introduces the altering rate of skills of human resources. The dashed connected arrow in this area represent the initializing the value of the HR Skills stock with the HR Skill. It should be noted that the higher levels of HR skill would increase the accumulated HR Skills and vice versa.

Moreover, Effect of HR Skill on quality determines the influence of human resources skills on the quality of services in this sector.

HR Investments area:

The biggest share of the investment is taken into consideration for hiring new human resources. As soon as the money is allocated to this section, the service providers start to hire new people. Apart of their monthly salary, the hiring system incurs some expenses for hiring each person which is defined as AVG cost of hiring HR per year. Using this constant, the rate of hiring, new hires, can be outlined as the ratio of the Investment in HR over AVG cost of hiring HR per year. This process is also time consuming that spans from the time an announcement is made until a contract is signed. An average one-year time delay has been taken into account representing an average time span of this process. Thus, together with the aforementioned ratio, the delay by using a “Delayinf” function applied in New hires. The actual number of HR in this system is initialized by the current number of employees in this sector which is an assumption. Retiring is the only motivation of HR outflow. Decreasing in the available stock of HR by firing, quitting and other reasons was considered negligible nand therefore ignored. Time to retire determines the working time interval and is set as thirty years. As such, HR divided by Time to retire indicates the retirement rate.

Although number of human resources in this sector has a direct effect on quality, this effect is not very strong and the function implemented in this variable, effect of HR on quality, does not have a sharp slop and increases slightly.

Infrastructure area:

Given the 20% of available financial resources to the infrastructure sector, pushes the local operators to acquire new infrastructure that influences the attractiveness of the region. Acquiring rate of new infrastructures is a function of Cultural infrastructure investment and AVG cost of INFR per year. The function using a “Delaymtr” function would consider five years of delay to construct new enjoyable infrastructure and public services.
As it has been depicted in the picture (Figure 4.3.2.3), the quality of the system is calculated in Quality as the effect of each sector multiplied by the maximum quality of services (Orange variable). In this study maximum Expected quality of services is 100% or 1. Therefore, the real quality of the system which is supposed to be perceived by tourists may vary between 0 and 1.

The stock of Perceived Quality of Services is initialized by Quality. The dashed-arrow represents this relationship and the Change in perception of service qualities is calculated using Quality and Perceived quality of services. The difference between these two variables over the Time to change quality leads to a variation range between 0 and 1.

The difference between perceived quality of the system and maximum quality form the GAP (yellow variable).

The bigger the gap means the lower level of tourist satisfaction and vice versa. As such, any increase in service quality leads to higher tourists’ perception and consequently the gap would decrease and the level of satisfaction would rise. This reverse relation is made through the function with the negative slope in Effect of GAP on tourists’ satisfaction.

In order to calculate the Tourists satisfaction, the same strategy as Perceived quality of services was considered. As such, the value range of this stock also remains between 0 and 1. Moreover, the changing rate of the stock, Change in satisfaction, is only the function of Effect of GAP on tourists’ satisfaction.
Figure 4.3.2.4 shows that the inflow rate of tourists to Sicily is positively correlated with tourists’ satisfaction. This rate is the function of Potential tourists in Italy and Effect of tourists’ satisfaction on tourists’ inflow. As such, the higher level of tourists’ satisfaction would lead to more tourists’ inflow and vice versa. In this study, the outflow rate of tourists in Sicily considers the whole population of visitors of this sector. In other words, it is assumed that all visitors would leave the Sicily in the same year and would not come back there within the same year.

In terms of stock of Potential tourists in Italy, this variable is influenced by the rate of Change in potential tourists in Italy, which is defined, by AVG monthly potential tourists in Italy over time.

In this system, since there is no direct link between service providers and tourists, tourists’ inflow is an indicator of the system quality of service provider. The less tourist inflow rate to Sicily implies a larger GAP. The larger the gap realized by service providers, the more effort is required to get fund from EU and national government in order to fill the gap. To do so, it has been assumed that each year they can submit maximum 30 call applications for new projects and get paid for each accepted ones (Figure 4.3.2.5).
Concerning financial resources, as it has been mentioned before (see section 4.2.1), this sector is supported by some different financial resources. All the resources have been categorized in three different groups. The income generated from ticket sales, financial transfer from national government and funds from EU for each accepted project which are derived from the income of the sector.\(^{12}\)

Figure 4.3.2.6 illustrates the funds’ inflow to the sector. Here both national and international resources integrate in one stock and flow. The *change in national fund* is the function of Fixed AVG funding per call accepted multiple by actual value of accepted calls plus summation of AVG National FUND and Transfer from national government for maintenance over 1 year. *Income from ticket sale* is taken into account as a multiple function between *Number of tourists in Sicily* and *AVG entrance fee per tourist per year*.

Simulation Results:

The behaviour of different variables are shown in the following diagrams.
4.3.3 Modelling of the perspective situation

As it has been mentioned before, in order to avoid complexity, co-creating the value with only tourists, rather than all actors, has been considered in this study. In addition, the e-engaging, by using ICTs, is the suggested method to involve the tourists as a decent way to create the value. (See section 4.5 to find more details in this regard)
Regarding the complete structure of e-engaging system and different possible policies to display the co-creating process, a major change has been made to the current structure of the system. The change mainly made by adding new structure to the investment policy. This new structure would be representative of the e-engaging platform and decision making centre of this sector (Figure 4.3.3.1). In addition, it corresponds to the missing part of the CLD which has been demonstrated through green dashed-arrows in section 4.2.1.
Figure 4.3.3.1: Snapshot-Stock and Flow diagram of the co-creation section
The information and material in new part of the construction are flowing from right to left. The assumptions are as below:

- Just 50% of visitors willing to share their experiences and propose for improvement
- In average each visitor would generate one proposals
- The proposals are categorized in four different groups as the investment areas
- The percentage of proposed ideas are scaled according to the comments gathered from recent tourists in Sicily during last years
- Evaluation process is based solely on costs and quality criteria are ignored.

Using web-based platforms, 50% of tourists visiting Sicily would generate their ideas based on their experiences in this Island. The Inflow rate of new ideas is assumed as one proposal per each tourist per year (Figure 4.3.3.2).

Figure 4.3.3.2: Snapshot-Stock and flow diagram of generating ideas

As it is illustrated in figure 4.3.3.3, following the evaluated process, the accumulated ideas, based on the tourists’ comments and willingness, would be split up to four different sectors of investment. Now, there are four different stocks corresponding to IT proposals, HR Skills proposals, Infrastructure proposals and HR proposals.

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13 Source: http://www.slowtrav.com/italy/sicily/pm_traveling.htm
In this step, decision makers and service providers, would evaluate each proposal in terms of quality and their associated costs of implementation. The outflow rates are representative of this internal evaluation process of the cultural heritage sector. As it can be seen in the picture (Figure 4.3.3.4), there are three different outflow rates for each stock in which they are inflows of three green, red and blue stocks. These stocks are representative of accepted, rejected and revision needed proposals, respectively. Types of the proposals are realized just based on their costs and some functions (if functions) determine the criteria of realization processes.

In terms of Quality features, they are ignored because of two main reasons:

1-Quality aspects are intangible and different from one proposal to the other. Moreover, it is hard to quantify and analyse it through math functions.

2-If the proposal is costly and the liquidity of the system is not sufficient to cover all the costs, the proposal would not be considered regardless of its quality.
Next step is to decide on investing on the accepted ideas. Therefore, before making any investment, the total cost of each accepted idea must be calculated in order to understand how much should be invested in different areas.

Then, the total costs of accepted proposals would be linked to the investment variables. Since the current investment is in accordance with the traditional investment rules and current investment policy is proved to be non-efficient, this thesis would suggest considering investing based on priority strategy. This basically means that we have to allocate a larger share of investment to the areas that tourists would like to get more services and improve those specific sectors. Thus, in order to better understand to what extend investment should be done in various groups to reach the highest quality and tourists’ satisfaction; six different policies have been taken into account in this study. These six policies have been chosen from 24 possible priority policies¹⁴ coming from the four different investment areas. The colourful network of variables is showing the aforementioned policies and variables with the same colour being related to one policy. (Figure 4.3.3.5)

¹⁴ $4! = 4 	imes 3 	imes 2 	imes 1 = 24$
Figure 4.3.3.5: Snapshot-Stock and flow diagram of the 6 new investment policies
4.4 System Analysis

Since system dynamics is a behaviour-oriented simulation discipline and the parameters of its models are subject to uncertainty, thus sensitivity of behaviour pattern measures should be explored in order to evaluate the impacts of parameter uncertainty on the behaviour patterns. Therefore, sensitivity analysis as a vital task for the reliability of simulation results has been taken into account (Taylor & Ford, 2006).

Basically, sensitivity analysis contains measuring the behaviour changes of models due to modifying one or more parameters value. This evaluating procedure has two main scopes:

- It aids the search of those parameters to which the model is particularly sensitive, and therefore helps the modellers to concentrate on their efforts on the estimation of the values of these key elements. This activity is crucial for the validity of the model.
- Sensitivity analysis is an important tool to establish a level of confidence for the results produced by the model.

Concerning these scopes, the sensitivity analysis regularly has been performed every time a new parameter was added in the model or some structures were changed substantially. However, there are six main sensitivity analyses which are reported in this study. The sensitivity analysis was carried out changing the investments’ priorities’ policies to clarify which policies has strong influence on the models’ behaviour and these six policies chosen from 24 possible priorities policies (4! = 24) including investment policies in accordance with tourists wants and vice versa. The implemented policy’s priorities are as following:

- Policy 1: Invest in IT, Invest in Infrastructure, Invest in HR SKILL, Invest in HR
- Policy 2: Invest in IT, Invest in HR, Invest in HR SKILL, Invest in Infrastructure
- Policy 3: Invest in Infrastructure, Invest in IT, Invest in HR SKILL, Invest in HR
- Policy 4: Invest in HR, Invest in HR SKILL, Invest in IT, Invest in Infrastructure
- Policy 5: Invest in HR, Invest in Infrastructure, Invest in HR SKILL, Invest in IT
- Policy 6: Invest in HR SKILL, Invest in Infrastructure, Invest in IT, Invest in HR

In Powersim software, creating “Switch control” makes it possible to create control panels for controlling inputs which enable policy makers to switch quickly between two or more strategies, policies or input alternatives during simulation.

The rest of this chapter aims at identifying and explaining the results of simulating from a qualitative point of view. Results of each new policy are reported together with the results of the current situation of the cultural heritage sector to better understand which policy is the most influential one (current situation is set as a benchmark and in diagrams it is depicted with the green line).

Implementing all considered policies shows that the first policy outperforms all other policies and the fourth one generates the worst result. It is not surprising as the first policy is completely in line with tourists needs and policy 4 is in contrast.
4.4.1 Policy 1: Invest in IT, Invest in Infrastructure, Invest in HR SKILL, Invest in HR

As it was claimed in previous chapters, the low performance of the sector does not related to the lack of liquidity and here, the liquidity diagram is confirming that claim. Although the liquidity is increasing with almost the same behaviour, however, the tourists’ satisfaction is increasing. In the next eight years would reach to almost 0.75, while with the current policy trends it would not go more than 0.3.

This promising result of satisfaction is the consequence of gap reduction from almost 0.6 in current situation to 0.25 by implementing the first policy. Growing the service quality is the major variable directly affecting gap reduction. As it can be seen, at 2015, the trends dramatically changes. This is just due to the aforementioned delay from the time of investment to the time of change in reality. In addition, number of tourists in Sicily as well as tourists inflow would have a dramatic growth due to the word of mouth of previous satisfied tourists.
4.4.2 Policy 2: Invest in IT, Invest in HR, Invest in HR SKILL, Invest in Infrastructure

By implementing policy number two, the trend of liquidity would not alter significantly. As it was mentioned before this growing implies that not only there is no lack of liquidity but also the more this sector would like to invest on new projects, the more financial resources would support the plans. Tourists’ satisfaction would also increase to maximum 0.45 by 2020 rather than 0.25 in traditional policies. Moreover, the rise in quality with some oscillations can be observed. Although achieved results are improving by new policies, they are less satisfactory which are certainly caused by taking infrastructure with the lowest priorities into consideration. The observed oscillations are due to the delays in some part of the systems.
4.4.3 Policy 3: Invest in Infrastructure, Invest in IT, Invest in HR SKILL, Invest in HR

From 2016, the quality of services in this system due to implementing the policy number three would increase dramatically up to 0.7. In comparison with the quality of the traditional policy there are almost no fluctuations in this ascending trend which is mainly due to the presence of IT and infrastructures at the top priority lists. Together with these rapid changes in quality the gap with the same speed but in different direction would change and reach to the 0.4 and would be the driver of higher tourists’ satisfaction up to 0.5.
4.4.4 Policy 4: Invest in HR, Invest in HR SKILL, Invest in IT, Invest in Infrastructure

Once the policy 4 was implemented, the system concludes the increase in service quality up to almost 0.7 and tourists satisfaction of almost 0.4. These are all caused by decreasing the gap from 0.9 to 0.4. Although liquidity and tourists inflow are growing, still the existed gap is not satisfactory and has to be reduced.
4.4.5  Policy 5: Invest in HR, Invest in Infrastructure, Invest in HR SKILL, Invest in IT
Implementing policy number 5, makes it possible to increase the tourists’ satisfaction starting by the end of 2014. The gap is decreasing to less than 0.3 with some major oscillations exactly corresponding to the fluctuations of quality behaviour. As it have been already explained this oscillations are because of the fact that, investing in infrastructures with the highest delay has been considered as a top priority.
4.4.6 Policy 6: Invest in HR SKILL, Invest in Infrastructure, Invest in IT, Invest in HR
Implementing policy 6 would lead to the tourists’ satisfaction of 0.45 by 2020. This result connected to the gap reduction to the almost 0.4 which is relatively better than traditional policy results. Due to delays of the system from investment to the changing pint of perceived quality, the change in quality is not very fast and after eight years it would just reach to 0.7 and would not completely fulfil the tourists’ needs. The trends of liquidity and tourists in Sicily have the same story as previously implemented policies.
4.4.7 Simulation results’ summery
Taking all results into account, since the first policy was set exactly according to the tourists’ sequence of priority so its final results are more promising and this policy would be suggested to the policy makers to follow. Considering all received proposals, it is obvious that tourists would like to face with more improvement in relevant websites and infrastructures and of course more qualified employees such as tour guides with high English and other languages proficiency and etc. The number of employees in this sector does not have major and direct influence on their willingness.

Moreover, the results (see Table 4.4.1) imply on the improvement through applying priority sequence policy rather than just allocating some investments shares to different areas. Putting efforts in one area and completely satisfying the tourist needs in one area and after that concentrating on another sector would foster the service qualities and tourists’ satisfactions rather than meeting the needs in all of areas at the same time but imperfectly.

<table>
<thead>
<tr>
<th>Policy</th>
<th>Quality</th>
<th>Gap</th>
<th>Tourists’ satisfaction</th>
<th>Number of tourists in Sicily</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>0.16</td>
<td>0.84</td>
<td>0.06</td>
<td>3488922</td>
</tr>
<tr>
<td>Policy 1</td>
<td>0.83</td>
<td>0.26</td>
<td>0.67</td>
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</tr>
<tr>
<td>Policy 2</td>
<td>0.66</td>
<td>0.44</td>
<td>0.42</td>
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</tr>
<tr>
<td>Policy 3</td>
<td>0.67</td>
<td>0.43</td>
<td>0.45</td>
<td>139708864</td>
</tr>
<tr>
<td>Policy 4</td>
<td>0.80</td>
<td>0.3</td>
<td>0.63</td>
<td>136292835</td>
</tr>
<tr>
<td>Policy 5</td>
<td>0.79</td>
<td>0.29</td>
<td>0.64</td>
<td>136263290</td>
</tr>
<tr>
<td>Policy 6</td>
<td>0.66</td>
<td>0.44</td>
<td>0.43</td>
<td>131382411</td>
</tr>
</tbody>
</table>
5 Recommendations and Conclusions

Role of Value Co-Creation provides a trading cycle through a flexible network that allows all actors co-produce and personalize experiences in order to foster sustainable service success (Subbiah & Ibrahim, 2011). Thus, value co-creation would foster welcoming the quality which depends on infrastructure for interaction to create innovative environment. As such, according to Subbiah and Ibrahim (2011), engagement becomes the core of any service related outcome.

Hence, seeking to engage tourists as active co-creators of value in a system must be considered as the solution for involvement and creativity. Therefore, ‘’Informed, networked, empowered, and active consumers are increasingly co-creating value with the firm and organizations’’ (Ramaswamy, 2004).

The development of technological product and services creates new path of source for competence purpose between the business and world leaders. It implies using ICTs as a purposeful implementation that meant to improve overall organizational activities to create a platform for engagement.

Although innovative technologies have been applied before; there has not been a decent feedback network between service providers and customers and other players such as stakeholders, hence this investments may go awry and make the efforts not efficient.

The same as other final costumers, tourists also enjoy providing feedback when they feel someone is listening. As such, feedback loops between service providers and tourists has been taken into account.

5.1 How to co-create with tourists? Ideation

Ideation as a very powerful and cost-effective way to co-create the value with tourists has been recommended in this study.

Ideation is the capturing of customer feedback and input in a systematic way, identifying the most important ideas, and providing feedback and encouragement to keep the ideas flowing (Litium technologies Inc, 2011).

5.1.1 Advantage of Ideation through social web

- Reducing costs
  Advances in technology together with strong cultural shift toward online social activities help to ideate with tourists and get their feedback wherever they are, in a very fast, easy, less and effective way.

- Enhancing tourists satisfactions
  Establishing a feedback loop between tourists and service providers helps tourist hold a positive opinion of the service providers because they feel someone is listening to them and this feeling get stronger if service providers act on their feedbacks.
Undoubtedly, considering rewards for those who gave the ideas in which are supposed to be implemented improve their sentiment and increase their satisfaction even more.

- **Diminishing risks**
  Ideation process via Internet would help service providers in cultural heritage sector to validate their plans and to acquire cost-effective feedback faster than traditional way which reduce the inherent risks of new service developments and new investment policies.

5.1.2 **How to ideate with tourists through social web**

In this section some steps are going to be suggested in order to utilize tourist’s generated ideas.

1. **Create a comprehensive structure using ICTs to engage the tourists.**
   This means giving the opportunity to the tourists to submit their ideas, discuss them, and vote on those they like the most. The goal is to encourage the visitors, even the first-time visitors, to deliver ideas, find other ideas and vote for them. Thus, a user friendly engagement platform in terms of accessibility and easy to navigate, which allows tourists to readily find out the ideas related to the subject of their interests, is needed.

2. **Define an internal evaluation group to evaluate the ideas**
   Needs for evaluation of the submitted proposals, decide whether they need to be revised, merit further research, meet the defined criteria or have to be rejected, push the system to make an evaluating group. The group must have the right members as key participants in evaluation process. Some key participants must be as following:
   - Someone who provides management support, sets the direction of the project, oversee the budget and re-evaluate the mission and directions regularly to ensure that they remain relevant
   - Someone who handles planning and day to day decision making
   - Someone who provides feedback, enforces the rules and helps users
   - Someone who is genuinely eager about ideation

3. **Set the criteria and define the ideation focus to meet the criteria**
   Qualities of posted ideas together with their costs, are the most important evaluation process criteria for this sector in which have to be defined clearly. Therefore in terms of quality, the expectations of qualities and limits have to be defined clearly.
   Regarding financial resources limitations, to have an efficient and effective ideation focus process, the sector has to be transparent.
   In order to promote transparency, an ‘‘IT Dashboard’’ must be developed. This tool allows tourists to monitor available financial resources and track the expenditures and
activities using visualization tools and mapping to gain precision data which leads them to generate ideas in line with available resources.

4. Define a comprehensive feedback loop for communicating with customers about ideas.
Providing feedbacks would show how serious is the cultural heritage sector in listening which has a significant positive impact on the overall productivity of the ideation process. Examples include:
- Considering rewards for visitor who propose the most proper idea which is supposed to be taken action on, foster visitors’ willingness to participate and let them know about the considered rewards in advance.
- Giving clear feedbacks to the owner of ideas which are not completely meet the whole requirements and asking to revise them also seems to be necessary in order to have an efficient feedback loop.
- Publishing the successes which are consequence of previous implementing of tourists ideas

5.2 Conclusion
The importance of intangible assets as drivers of corporate performances became critical in management studies over the last few years (Brondoni, 2004; Beretta, 2005).

As it was mentioned before, the interaction between customers and service providers is the locus of value creation and can be considered as one of those aforementioned intangible assets. The main aim of this created value, so called “Value Co-creation”, is to foster the process of organizational knowledge, by involving the customers in creating value, which also creates the opportunities whereby mutually beneficial outcomes can be achieved. To achieve this goal on one hand and to fulfill customer’s diverse needs on the other hand, a well-designed service experience is needed. This systematic and dynamic design would help service providers to explore all the inherent and acquired issues impact on creating value.

Since on one hand the interest to learn about other culture and visit amusing and adventure place has grown, tourist experiences, as one of the most important means of increasing experiences economy, should be taken into account. On the other hand, as it is not easy to implement the idea of satisfying customers while involving them in practice, so this thesis aims to employ and analyse all considerable factors which impact on customer satisfaction within service experience design through simulating a system dynamics model of the considered situation.

Accordingly, these sensitivity analysis not only enable service providers and policy makers to comprehend the entire situation of experience design but also help them to effectively predict and evaluate the possible results of design strategies via system dynamics modelling.
This study would allow tourism experience operators and providers to design more customer-oriented service experiences which is simultaneously emphasize on those vital factors as a driver of tourism satisfaction.

Accordingly, this study via system dynamics modelling:

- Would allow tourism experience operators and providers to design more customer-oriented service experiences.
- Enables service providers and policy makers to comprehend the entire situation of experience design
- Help them to effectively predict and evaluate the possible results of design strategies by sensitivity analysis the key factors as a driver of tourism satisfaction.
- By using causal loop diagrams and stock and flow diagrams, based on the simulation results of system dynamics, helps service providers to analyze the impact of feedback and time delays on customer experience design in which increase the efficiency of strategic decisions and also enhance the viability of implementing them in future practices and allows developers to work out details ahead of time.

5.3 Future work

The development of technological product and service creates new path of source for competence purpose between the business and world leaders. This critically creates wealth for service related businesses. As it turned the 21st century into virtual and mobility, service became the targeted weapon for consumer/user worldwide naming in whichever field of operation. Engagement becomes the core of any service related outcome. Value co-creation is important in service based system delivery in order to attend quality that depends on infrastructure for interaction to create innovative environment. It demands a need to recognize consumers’ role as connected, informed and create active engagement.

As a result applying the value co-creation concept would be helpful for all profit and non-profit organizations, including public and private sector, which are supposed to deliver specific products or services. It is mainly because of the fact that both providers intend to satisfy the customer/user/citizen, independently as a main indicator of their own performances.

Regarding this thesis, that would be very interesting if all the actors in cultural heritage sector, which due to simplifying the system were ignored, would be taken account.
6 References


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15 *All the data have been extracted and downloaded during the period of June-October 2012*


Dowson, R. (2007). *SERVICE DELIVERY INNOVATION.* *America.*


