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Experiencing Finnish Lapland: Design for Sustainability

through cultural communication in tourism

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Abstract

Tourism, as an important domestic economy booster, has been heavily hit by the COVID-19 pandemic and severely declined. Governments are rethinking tourism for future new opportunities. Previous research has shown that large development scale of tourism is not conducive to sustainability, nevertheless, researchers have also found that managing tourists' behavior can reduce the adverse effects, while other studies are proposing the effectiveness of environmental education on sustainability. However, little attention has been paid to the combination of environmental education and tourist management for sustainability purpose.

This study aims to explore the potential of sustainability-oriented design through cultural communication in tourism. No matter what method is used to communicate sustainability, this research believes that the impacts of communication should seek to be sustainable and far-reaching, and more importantly to be applied in reality to present its value. To achieve the goal, this study takes Finnish Lapland as a practical entry point, follows service design thinking and takes ethnography as the research strategy, conducting qualitative research through semi-structured interviews, field studies, and workshops. The data from 57 stakeholders have been collected to quest opportunities and needs, based on which, a design outcome was produced as feedback for iterate. The findings show that sensory design can prolong the impact of sustainability, and the application of environmental education as a cultural content can meet the needs of stakeholders while contributing to sustainability. Furthermore, online sales may provide alternative options to alleviate COVID-19 impact on tourism industry and to build economic resilience and consumer confidence. The results show considerable potential in cultural communication for sustainability in tourism, which offers directions for future research in the area.

Keyword: Sustainable design, cultural communication, environmental education, sensory design, service design, tourism

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Last but not least, I want to thank my parents for the endless love, but when I express my gratitude to you, all the words disappear, all I remember is that they painted the first picture in my life, which set me on the road of design.

I hope this thesis will be the start of academic thinking, I hope this is not just hope. Although I am infinitely small in this world, I will still face everything with the greatest enthusiasm and kindness, to return the love and help you gave me.

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Chapter 1. Introduction

Every human being in this world is responsible for building a sustainable future for the earth. However, when it comes to collective responsibility, the role or effort of a specific individual is weakened, which makes sustainable development a vague and ambiguous concept.

There are so many global issues that need our concern, such as global warming, biodiversity loss, infectious diseases, etc. However, it is widely acknowledged that one cannot talk to summer insects about the ice. Understandably, it is extremely hard for those who are experiencing drought to imagine how melting glaciers can be a massive problem. It is the same that why few of us can perceive the true value of sustainable development in our everyday lives.

Fortunately, tourism might be effective in building and heightening people's awareness of sustainable development. Traveling can provide opportunities for people from different places to understand each other's situation, and tourists often try to experience another kind of life when traveling (Fan & Xie, 2017). Through such opportunities, one may awaken one's sense of responsibility, and the local government and citizens can spread their culture and develop local economic sustainability.

According to the Regional Council of Lapland (2011, p.12) , Lapland aims to become the top tourism destination in respect of sustainable development of natural environment and tourism experience in Europe by 2020. Besides, their strategic target is to double the current tourist numbers by 2020 (Regional Council of Lapland, 2011, p.13). However, tourism infrastructure and increasing visitors are damaging the natural environment, which is an acute problem in the Arctic region (Grimwood, 2015). Moreover, a sustainable environment is the foundation of local tourism, especially for Lapland, whose economy is highly dependent on nature-based tourism. (Tyrväinen et al., 2008). It can be discovered from above that improving tourists' awareness of

environmental protection is of great value in employing the concept of sustainable development of the local natural environment and economy.

Cultural communication and environmental education are indispensable parts of tourism service design (Qian, 2019). Qian (2019) believes that using service prototype information effectively and collecting relevant industry data are, to a certain extent, key to sustainable tourism service design. In the sustainable development of tourism, promoting cultural communication can help to attract more tourists and arouse social awareness of important issues, such as education, improvement of social convenience, public health, and environmental protection.

In addition, according to Wallace and Russell (2004), every development project must take residents' suggestions on board, and be planned and managed to benefit the locals and the environment. It is crucial for local governments who target to develop a tourism economy, especially in environmentally sensitive areas, to achieve sustainable economic, cultural, and ecological development. If the emphasis on education for sustainable development is able to enhance people's understanding, then this kind of education as an important culture, will avoid the contradiction between economic ability to survive and needs for ecological (Wallace, 2004). Therefore, interviews were conducted with the inhabitants of Finnish Lapland in this study, a workshop was launched to explore the needs of relevant stakeholders as well as the analysis of the concept of cultural communication in line with the values of Lapland by reviewing documentations.

This study, instead of focusing on providing final design solutions, but tries to generate ideas and conduct research through design. It aims to include the concept of sustainable development education in the content of cultural communication, which will be integrated into tourism services through the method of service design. It is expected that more tourists will be attracted by the online sensory traveling experience, and the possibility of tourists arriving at the traveling destination in person will be increased.

Furthermore, this study tries to contribute to the sustainable development of the local economy, ecology, and culture in Lapland, Finland.

1.1 Purpose and Significance

This thesis is from the programme of Arctic Art and Design, while the environment is sensitive in the Arctic (Grimwood, 2015), which also enables me to pay more attention on sustainability and environmental protection. Sustainability is an abstract term, but fortunately art and design have proven to have the potential to enhance the expression of sustainability (Liu, 2019). However, art is more concerned with the content of sustainable for communicating, while design focuses more on how to enhance people's understanding for sustainability. But what I would like to argue is that the aim is to make the communication sustainable rather than simply communication, only when "communication on sustainability" itself is sustainable, can it be possible to achieve the long-term and effective implication.

However, how to identify whether this implication is effective is also a significant factor that needs to be considered in relation to communication sustainability. My viewpoint is that communication should be integrated with reality through testing the effectiveness of implications with pragmatism as a guide. This is the other viewpoint I would like to argue: Understanding sustainability is just the first move and making the impact last longer is the second step, whereas the significant point is to reflect this impact into reality. And the purpose of this thesis is to verify this conjecture through study.

Therefore, this study takes tourism in Lapland as a practical entry point, to verifies the effectiveness of implications through cultural communication on sustainable. Firstly, in the research, the needs of both sides of cultural communication were obtained through the thinking approaches of service design, as well as connected it to the literature review. Subsequently, environmental sustainability was selected as the communication content, and online media was selected for cultural communication which can deal with

emergencies such as the epidemic. Eventually, obtain users' feedback through actual design outcome to receive the result. Due to experience and time limits, this thesis only conducted a small range of research and tests, but the purpose is to put forward opinions and issues rather than providing the final solution.

1.2 Research Objective and Question

How to integrate sustainability into Finnish Lapland's tourism services, to help Finnish Lapland's tourism to deal with emergencies such as the outbreak of COVID-19, and to transform the needs of stakeholders into measures to promote sustainable development by designing, has become my inspiration. By literature review, I identified the objectives and following research questions, as well as its subordinate research questions:

Aim: Designing for sustainability through cultural communication in tourism.

Research question: *How can design promote cultural communication in tourism to promote sustainable development?*

1. In an unprecedented situation like the COVID-19 pandemic, what design opportunities are suitable for cultural communication in tourism in Finnish Lapland?

2. Regarding the Finnish Lapland region, especially Rovaniemi, what are the needs and challenges of cultural communication in tourism?

3. How can design play a role in cultural communication in tourism?

i. What role can service design play in cultural communication?

ii. How does sensory design enhance the user's experience of cultural communication?

Objective 1: To explore methods for cultural communication that are suitable to tourism in Finnish Lapland and can better respond to the COVID-19 pandemic.

Objective 2: To investigate the needs of relevant stakeholders (especially local residents and foreign tourists) in cultural communication.

Objective 3 : To explore how cultural communication of Finnish Lapland can be improved through service design and sensory design to enhance user experiences.

The first research issue focuses on looking for the current design opportunities of Finnish Lapland. The second research issue focuses on Finnish Lapland's demands and challenges about cultural communication. The third research issue discusses how to achieve cultural communication through designing, and explores how to use sensory design and service design to enhance tourism experience. The theoretical background of this study is multidisciplinary.

This study's innovation lies in using service design thinking methods to transform the environment education into cultural services to promote sustainability and explore new cultural communication methods in Finnish Lapland. This study explored the cultural communication content which suitable for Finnish Lapland and also the needs of relevant stakeholders. Besides, this study try to enhance cultural communication through sensory design.

1.3 Research Process and Approach

This study is qualitative research based on interpretivism as the paradigm. The double diamond model can be used to describe my work process (Figure_1). Before the start of the first diamond, the literature review was used to find the research gap and put forward research questions. As the research question requires me to form an in-depth understanding of the relevant stakeholders, I chose ethnography as the research strategy, resulting in the following three stages of research (Figure_2). First of all, in the first diamond, phase 1 and phase 2 was completed through field study, semi-structured interview, and workshop to obtained data for answer research questions, which helped me to get a hypothesis at the intersection of the two diamonds. Therefore, design

ethnography was used to start the research phase 3 and to answer research question 3. In phase 3, I tested my hypothesis by outputting the design outcome and finally conducted content analysis and thematic analysis on all the conclusions obtained from the research. Integrate and generate new knowledge for iteration as the final outcome.

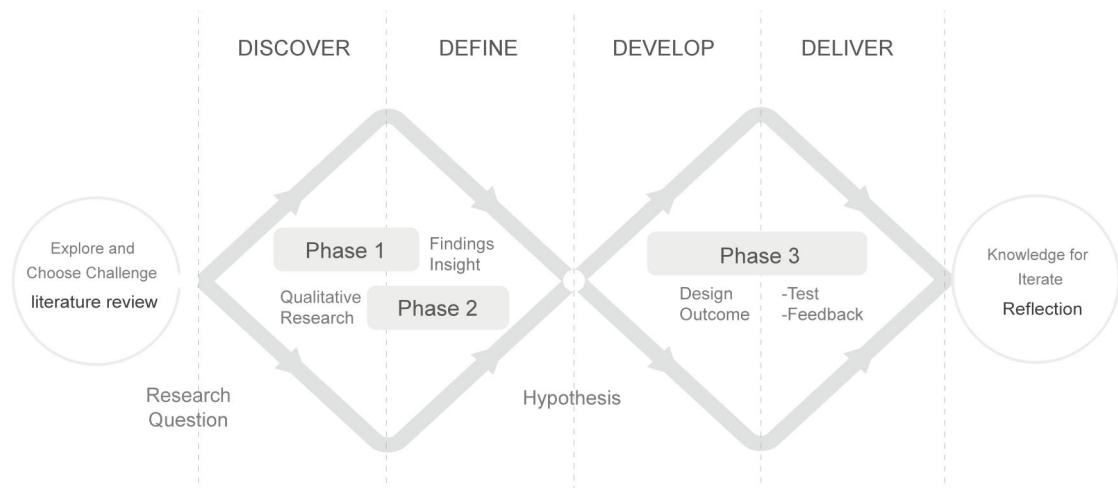


Figure 1. The working process of this study

Research Phase	Sample	Strategy	Method	Data collection	Aim
Phase 1	ARCTISEN Project: 15 participants	Ethnography	Semi-structured Interview Field study	Video and audio recording Observation, Photo Text and diary	To answer research question 1 and 2
	Online Interview: 12 participants		Semi-structured Interview	Audio recording Text	
Phase 2	ThinkARTant Project: 12 participants	Ethnography	Workshop (with art-based method) Tools: Photo colleges, Maps	Audio and video recording Visual text Observation Photo	To answer research question 2 and 3
Phase 3	Design Output Ideation: 3 participants Feedback: 15 participants	Design Ethnography	Workshop (for ideation) Tools: Role-playing	Audio recording Visual text and notes	To answer research question 3
			Semi-structured Interview	Audio recording Text and notes	

Figure 2. The methodological classification of this study

1.4 Structure of This Study

Chapter 2: Literature Review

This chapter outlines the cultural communication of tourism, service design, sensory

experience, Finnish Lapland, environmental education and research gaps. The purpose of this chapter is to find the content suitable for Lapland's cultural communication, confirm its practical significance and the possibility of promoting sustainable development, then apply it to culture communication through service design and sensory design.

Chapter 3: Methodology

This chapter details the aim, objectives and research questions of this study. It explains the selection of methodology, including paradigm, research strategy, data collection method and analytical method.

Chapter 4: Findings

This chapter summarize findings based on data collection and literature review, combined with the summary and reflection of the interview, online research , field study, and workshop. This chapter also proposes suggestions for optimizing online services and how to deepen the impact of environmental education on tourists.

Chapter 5: Solution

This chapter will introduce the design solution and output process of this study. First, I summarized the preliminary design orientation from the research results, then conducted the ideation session and role-play ideation with relevant stakeholders, after which I refined the design criteria to generate specific design criteria. Finally, the final output and test results were presented.

Chapter 6: Discussion

This chapter discuss the validity and limitations of this study, including answers to research questions, and discussions on deficiencies in the whole research process.

Chapter 7: Conclusion

This chapter introduces the summary of this research, including the analysis of research process and solutions, and give suggested directions for next research.

Chapter 2. Literature Review

The main research themes in this chapter are sustainability, cultural communication in tourism, environmental education, service design, sensory experience, Finnish Lapland, and a gap in the research. The purpose of this chapter is to find the content suitable for Lapland's cultural communication, confirm its practical significance and the possibility of promoting sustainable development, then apply it to culture communication through service design and sensory design. Firstly, this chapter demonstrates the close interaction between tourism and cultural communication; then it shows the significant influence of service design and sensory design on cultural communication; secondly, expounded the feasibility of environmental education as the content of cultural communication; thirdly, it explores how to improve the experience in tourism for sustainable development. Lastly, this part analyzes the gaps in the research. This study furtherly intends to explore the possibility of using design to make the impact of "sustainability" sustainable, and take Finnish Lapland tourism as a practical study to explore the actual value of this impact.

2.1 Definition of Sustainable Development

The *Butland Report*, published by the World Commission on Environment and Development in 1987, contains the most generally accepted concept of sustainable development, which states that sustainable development is described as meeting the needs of contemporary people. Sustainable development is described as progress that does not jeopardize future generations' ability to fulfill their needs. Sustainable development is also a mechanism that cannot be separated from the environment (Elliott, 1999). It must achieve sustainable prosperity while still protecting natural resources and the ecosystem that humans depend on for life, such as the atmosphere, freshwater, seas, soil, and forests, to satisfy the life and development for future generations (Chichilnisky, 1997). Furthermore, environmental conservation and sustainable growth are connected

and distinct. In one side, environmental sustainability is a necessary component of long-term growth. Growth is at the heart of sustainable development, which requires economic and social stability based on tight demographic management, improved population efficiency, environmental protection, and resource sustainability (Chichilnisky, 1997).

Definition of sustainable development focusing on natural aspects

Ecologists coined the word "sustainability" to describe ecological sustainability. Its aim is to demonstrate the delicate balance that exists between natural resources and their production and consumption methods. The International Union of Ecology (INTECOL) and the International Union of Biological Sciences (IUBS) deepened the concept of sustainable development at a seminar on sustainable development in 1991. And sustainable development is defined as the protection and improvement of the production and renewal potential of the environmental system, which means that sustainable development does not mean to develop the environment, but to renew the environment.

2.1.1 Definition of Sustainable Development Focusing on Economic Aspects

Edvard (2010) describes sustainable development as "on the basis of preserving the efficiency of natural resources and the services they offer, while optimizing the net benefits of economic development". Pearce (2017) believes that "*Sustainable development means that today's use should not reduce future real income. When development can keep the welfare of the present people increasing, it will not reduce the welfare of future generations (p.3).*"

2.1.2 Definition of Sustainable Development on Technology Aspects

Sustainable growth, according to Elliott (2012), entails transitioning to safer and more efficient systems, as similar as possible to "zero carbon" or "sealed" process processes, and reducing electricity and other natural resource use (DuBose et al., 1995, p.11).

2.2 Cultural Communication in Tourism

Tourism is the at a steady pace across the world as people's material living conditions rise. Joun and Kim (2020) show that tourism is a powerful economic engine around the globe. As a new form of cultural exchange and dissemination, cultural tourism runs through the tourism experience. The accumulation of local culture, traditional customs, artistic style and natural environment of distinct regions forms the unique cultural influence on visitors. People began to pay more attention to in-depth social communication and no longer a single cultural experience (Kim, 2020).

The regional cultural characteristics are integrated with tourism and delivered to the public in cultural tourism derivatives, thereby forming a stable regional artistic output. Besides, the process of cultural communication enhances social communication and influences and promotes the potential of local tourism. It offers tourism to transform the advantages of regional cultural resources into economic benefits and link the construction of spiritual civilization with traditional culture (Kugapi et al., 2020). More importantly, cultural communication in tourism sustainability draws visitors and encourages social attitudes, such as creative creation, cultural education, social transformation, social amenity changes, and improved public health, education, attitudes, and environmental protection in the host society (Hashimoto, 2008, p.1088-1090). Finally, the cultural communication model follows the tourism sustainability principle: Balance the environmental, economic and socio-cultural aspects of production in order to ensure long-term sustainability (Hashimoto, 2008, p.1089). Therefore, a sustainable concept is needed to facilitate cultural tourism to stimulate regional growth, optimize

the utilization of natural and social resources, and finally positive fiscal, urban environmental, and social transformations can be achieved. Furthermore, since the outbreak of COVID-19, the social economy and people's lives have undergone certain changes (Kock et al., 2020). However, previous researchers still have gaps in the research on the tourism industry's online cultural communication. The cultural communication itself is only a one-way flow, which requires the cultural communication place's culture to be in an advantageous position in the cultural exchanges of various countries. That is, it should be a "strong culture." Simultaneously, advanced media and communication tools are conducive to cultural communication and penetration of cultural communication destinations to achieve better the purpose of expanding the influence and popularity of tourist destinations (Kock et al., 2020).

In addition, although most parts of the world are still under lockdown, online social platforms have almost become the greatest hope for many tourist attractions and design brands, and they have quickly turned into an emerging testing ground for innovative cultural communication methods (Lee, 2021, p.5-8). Stickdorn (2016) mentioned that tourists' number in tourist attractions would rise when the environment is safe. Therefore, the online service design plan established during the COVID-19 epidemic will continue to exist. This trend will be particularly beneficial to those who continue to provide their customers with the best services during the epidemic.

Alves (2020) predicts that more and more regions will provide tourists with online travel services. From personalized cultural and creative products to travel column blogs, this trend will only accelerate than ever before.

2.3 Service Design

Service architecture is a new discipline that is having a big impact on how people think about designing product-service networks (Meroni & Sangiorgi, 2011). The features of service design are based on the design starting point of human needs. Unlike the

traditional concept of architecture, which focuses on manufacturers, service design considers a service from the outside in, beginning with consumer viewpoints (Holmlid & Evenson, 2008, p.341). “*Service Design is an explorative approach to developing novel ways of performance cocreation,*” according to Kimbell (2011, p.4). Service architecture, according to Evenson and Dubberly (2010), is “*a conceiving and iteratively designing to create a service structure to design rich experiences for customers.*”

The user of the service design language refers to all the people or organizations involved in starting, executing, and completing the service. The key to a user-first service design system is the service touch point. Designing for different touch points can effectively explore and meet the needs of different users at different levels to create a diverse experience.

Besides, service design serves as practices reshaping mental models and innovating service ecosystems (Vink, Wetter-Edman, & Tronvol, 2019). The object of service design is the user’s “experienced products”, which includes tangible products and intangible services. Users obtain multiple experiences through participation, from physical sense to mental perceiving. Therefore, service design is built based on physical design: human-human, human-machine-human, human-machine-human-environment interaction processes. In essence, service design is not only a service process but also covers the various products, spatial environment and service behaviour of the entire system.

Service designing requires paying attention to users’ sense and feeling in cultural experience, bringing a rich entertainment experience and in-depth regional cultural attraction. Balancing the demands of user experience, relevant stakeholders, economic, social and environmental parties achieves the sustainability of cultural tourism. Hence, the process of service design contributes to the dissemination and acceptance of culture and the sustainable development of society.

2.3.1 The Current State Of Finnish Tourism Service Design

Finnish design is not just an object that people see but also everything people can experience. In the world design of the 21st century, Nordic design is a very important part of it, Finland is the representative of Nordic architecture, especially in tourism service design (Müller, 2020). About 10,000 design professionals in the Helsinki region alone prove that Finland is a real design country. It is undeniable that everything that can be seen designs, and all people understand design.

The concept of sustainability and the value system established based on respect for the natural world has made Finland a pioneer country in the environmental movement. (Rahman, 2014). In Finland, sustainable living has been woven into the latitude and longitude of service design. Sustainability is seen as an essential element in everything from food and energy consumption to design and tourism, and it is related to the well-being of local communities (Rahman ,2014).

Service design is everywhere in Finland, and the most famous example seems to be Helsinki Airport in Finland. The project ultimately saved Helsinki Airport in annual costs of 12 million euros and was reported by more than 80 English publications worldwide. It is worth noting that the project attracted more than 5 million users on Twitter, which made the airport the number of international transit passengers increased by 3%(Zhou, 2020). It also won two awards: the Finnish Design of the Year Award and the Global Service Design Award in New York. The plan largely adopted the concepts of service prototypes. It further refined the service prototype production methods, such as role-playing, and created an immersive user experience for the project's service prototype (Zhou, 2020).

2.4 The Potential of Sensory Design

Sensory experience refers to the interactive feedback and immersive experience generated by the users' senses after receiving external stimuli. The senses are generally understood as five senses in design: vision, hearing, taste, smell, and touch. Five-sense design is a design method that caters to the customers' sense of experience by designing details and improving the environment (Godovykh & Tasci, 2020).

With the increasing choice of design resources and materials, the sensory design concept transitions from a single-sensory experience design to a multi-sensory experience. Initially, the characteristic of single-sensory experience design is to meet the one-sided sensory needs of the experiencer. However, this single sensory is challenging to ensure that users get a continuous sensory experience (Chou, 2019). To further deepen the single sensory stimulation, design needs to explore a more in-depth sensory experience and achieve interactive experience by continuously deepening this single sensory. Then, the purpose of multi-sensory experience design is to break the limitations of single-sensory experience. Stimulating the sensory function of the experiencer in multiple directions aims to enhance the participants' richer sensory experience and longer-lasting physical memory. This experience can directly affect people's behaviour. The third mode is the full-sensory experience design: the five senses work together to stimulate the user's sensory functions in all aspects. The full sensory experience combines the respective advantages of different senses to create a more three-dimensional and impressive sensory atmosphere (Chou, 2019). The brain analyzes and processes the sensed information, forming a comprehensive perception and rising to consciousness level. As a result, it reacts to the human body and nervous system, affects users' mental system, and guides people's living habits and mental state.

The potential of visual art is to explain this complex change and inspire more long-lasting and intense memories of the individual. (Jónsdóttir, 2017). This is exactly what I want to do, to deepen people's impression of the local environment and local

culture through tourism experience. The advantage of doing so is to promote local sustainable development. The focus of this part is to use artistic means to deepen the tourist experience and make it develop towards cultural sensitivity and environmental sustainability.

As Fan and Xie (2017) said, experience as a term covers every aspect of human life. The same is true in tourism. According to Franklin (2018), art has always inspired the development of the tourism industry, which has been “placed” for various reasons, such as where to sell, where to be created, where to be exhibited, where to collect, where to be displayed, etc. The experience that art can bring to tourists in tourism comes from all aspects, then the experience should also affect tourists from all aspects. According to Fan and Xie (2017), the experience through the five senses is direct and far-reaching.

Tourism will inevitably affect the lives of the local people and the local image of the world, as well as the free creation of art (Hume, 2013). While developing tourism, it should not catch at a shadow and lose the substance. How to control the balance of cooperation between tourism and art, where is the scale between these two is always an issue that should always be considered.

From the review of the current literature, it can be seen that art has always inspired the development of the tourism industry is compelling but has significant notable items. (Franklin, 2018). And what can be confirmed is environmental art is suitable for the development of Arctic tourism. Especially Ice and snow were able to be the main factors in a commercial model when it comes to the business environment (Vuorjok, 2003). Their purpose is to inject aesthetic factors into the hotel and innovate the conventional ice sculptures to attract more tourists and spread knowledge in this way. (Dorsman, 2013) According to Dorsman (2013), his design is based on his thoughts and created a snow cave which shows the way of how ancient northern people live and talked in a connotation way to describe the sanctuary, the second contribution is he placed stars on the ceiling related to Lapland culture like big dipper fishnet and rabbit,

which put travelers in a deep feeling of "Lapp" through this starry sky Heaven. Giving people access to environmental art while gaining business value is undoubtedly a good way to tourism art.

According to Huhmarniemi (2019), environmental art is very close to applied art when it comes to the various needs and purposes defined by the client. More kinds of art like performing arts, the sensory design need to explore and the cooperation between art and tourism should not be limited and need to have far-reaching and more tiered influences. It would be a good way to enhance the travel experience through art, pass the good travel experience to convey the local culture, and subconsciously affect tourists' attention to the local ecological environment.

In the tourism industry, especially for environmentally sensitive areas, it is important to realize the sustainable development of the economy, culture and ecology. According to the conclusions drawn by Wallace and Russell (2004) in two existing cases, the authors tried to apply their findings and test their hypotheses in the Salma Lake region of Finland. Through this project, the authors concluded that any development project must listen to the local People's opinions, whether it is project planning or management, which should benefit locals and their environment. And it must be economically sustainable, as well as ecologically and culturally sustainable. The author emphasizes that if cultural sustainability is not respected, the conflict between the desire for Eco-cultural sustainability and the need for economic viability would be inevitable. The role of art in promoting environmental awareness cannot be ignored, and art occupies a huge position in tourism.

According to Fan and Xie (2017), tourism is embodied; visitors will obtain the emotional experience through physical perception, while the emotional experience is a prerequisite for a high-quality tourism experience. Besides, sensory experience brings value to other aspects, such as leading tourists being aware of the local impact of their travel footprint, accepting local culture, etc. Therefore, sensory stimulation-focused

ambience designs can enhance tourists' favorability of related environments and cultures. Combining different sensory experiences to create an immersive experience, allowing tourists to get a more realistic travel experience (Small & Dancy, 2012). In summary, introducing sensory experience will be feasible, and this concept would be applied in cultural tourism by creating a five-sense ambience experience (Chen & Lin, 2020, p.15).

2.5 Finnish Lapland

Lapland in northern Finland lies within the Arctic Circle and occupies a quarter of Finland's total area. The annual average temperature is below zero degrees Celsius, winter enters every October and spring begins in May of the following year (Grahn, 1991). During the 8 months of winter, the falling snow turned the earth into a fairy tale world of ice, becoming a paradise for skiers.

The natural scenery of the polar regions creates one of the tourism images of Lapland and brings tourists a unique regional experience. The natural landscape of Finnish Lapland provides tourists unique geographical features, regional climate and cultural customs, includes icebergs, natural forests, rivers, and the Arctic Ocean coast. In Lapland, the main factor for nature-based tourism is natural scenery (Tyrväinen et al., 2009). Therefore, the Finnish Lapland tourism industry utilizes its landscape characteristics to attract tourists with skiing and aurora viewing activities. Winter tourism with distinctive exotic customs, healthy and rich outdoor activities and polar landscapes become a popular option for tourists to visit Lapland.

Moreover, the reindeer and local handicrafts symbolize the national culture and history of Lapland. Sámi herders, as an indigenous inhabitant of Finnish Lapland, offers visitors another unique nomadic cultural language and nomadic landscape. Reindeer herding is the original activity and livelihood mode of the Sámi community, creating more attractiveness for Lapland tourism. With the combination of grazing land and tourist

experience, reindeer functions as a cultural tourism symbol representing indigenous hunting elements (Roturier, 2009, p.6). On the other hand, Härkönen and Jokela (2015) demonstrate how northern handicraft practices can be used in modern tourism and explore their importance in fostering cultural survival in the north (p. 1907). Visitors will revisit their environmental world view and the heritage importance of aboriginal culture by participating in a craft production experience using natural resources.

2.5.1 Development Status and Trends of Finnish Tourism

According to the data research of Tourism Observer (2020), Finland's tourism industry has continued to grow with record numbers. The number of non-resident accommodations increased by 1.3% to an impressive 6.8 million in 2019. The world situation under the influence of COVID-19 is full of challenges, the number of non-residents staying overnight in Finland is predicted to increase in 2021, with new records breaking (Vento et al., 2020).

On the 100th anniversary of Finland's independence, tourism contributed to maintaining and increasing the new degree of tourism demand. The Finnish Tourism Agency's long-term efforts are: Systematic marketing and global promotion of target markets. National development. Internationalization and salinization of regional or company products in the tourism sector (Rautio, 2020).

The World Tourism Organization (UNWTO, 2021) projects that Europe's foreign tourism market will expand by 3-4 percent in 2021. Tourism is becoming more dynamic and is defending its status.

Foreign participation in Finland and emerging markets are growing. To convert this curiosity into demand, related organizations must collaborate to market the geographic diversity and quality of the Finnish online tourism industry. As seen from a global business viewpoint, variety draws people and fosters competition (Kulusjärvi, 2016).

Finland has four main tourist areas, which are unique even on a global scale: Helsinki, Lapland, Finnish Lake District, coast, and archipelago, each of which has great potential to attract more and more tourists. Especially, Rovaniemi of Lapland has laid the Finnish tourism industry's foundation to provide tourism services and establish attractive tourism service design (Tran, 2020).

Rovaniemi is located within the Arctic Circle and Lapland's capital, and it is also known as Finland's second capital. The city's total area is 7.910 square kilometers, of which the water area is 410 square kilometers. Rovaniemi is also a town in northern Finland. This city is located at the Ounas River's mouth and the right bank of the Kemi River. It was built in 1929 and used to be a center for timber transportation and leather trade (Zhou, 2018). Rovaniemi is also one of the winter tourism centers in Europe because the Scandinavian Winter Games are held here every year. Also, Rovaniemi is known as the hometown of Santa Claus. The world-famous Santa Claus Village is located on the Arctic Circle at the edge of the suburbs 8 kilometers north of Rovaniemi. The most famous tourist attractions in Rovaniemi include Korvatunturi and SantaPark (Björk, 2014).

As the easternmost nation in the European Union, Finland's strategic position places it close to the Asian and Russian economies, a significant competitive advantage. This, though, presents a challenge, which is why it is critical to consistently retain a good business position in the EU and the United States. According to the European Tourism Commission's (ETC, 2021) projections, these regions will continue to rise at the highest rate in Europe's tourism traffic, and it is claimed that this development has not yet peaked.

According to statistics, the top five countries that visit Finland remain the same as in 2019. The countries with the most overnight stays are Russia (816,000), Germany (628 000), the United Kingdom (595,000), Sweden (560 000), and China (385,000, including Hong Kong) (Liu, 2019). In 2019, Finnish tourism and tourism industry companies

excelled at marketing and revenues, especially in key markets such as Germany, the United Kingdom, China, and Japan, as well as in rapidly rising markets such as the Netherlands, France, and the United States (Sthapit & Björk, 2019). Tourists in these markets have become particularly important for the economic growth and cultural communication of Finnish tourism (Sthapit & Björk, 2019). Most European tourists prefer online search and functional query websites, while portal-based travel websites that focus on content aggregation are slightly less (Shen, 2020).

2.6 Environment Education

Environmental education is centered on the interaction between humanity and the environment to resolve environmental issues and achieve sustainable sustainability, increasing people's environmental consciousness and capacity for successful engagement, popularizing environmental conservation literacy and skills, and cultivating environmental protection talent. Education is a method of social practice. In its simplest form, environmental education is an educational practice that focuses on the interaction between humans and the environment. Population rise, new technologies, and the fast advancement of modern productivity also contribute to environmental issues (Ardoin et al., 2020). As a result, humans are worried about the degraded state of their natural conditions. Global change, for example, has resulted in the rise of environmental education. The initial impetus stems from a need to protect and cherish human existence.

The Tbilisi Declaration said that "through its very existence, environmental education will lead to the regeneration of the educational phase" and urged for "conscious integration of environmental issues, practices, and material into the educational framework." Environmental education aims to increase people's knowledge of the environment and consider environmental problems through instructional approaches (Varela, 2020). It can educate people about the proper partnership between people and the climate and unite all community stakeholders to work cooperatively to facilitate the

implementation of strategies for mitigating global warming.

At the stage of primary education, Finland sets the goal of education for sustainable development as raising students' environmental awareness and is committed to a sustainable lifestyle. Students must be able to perceive and recognize changes in humans and the environment (Gadotti, 2008). Regional and international consequences, develop students' critical and creative thinking, and give students opportunities to participate, experience and take responsibility, help students cultivate awareness of sustainable development during the learning process, and promote global environmental changes such as the global warming strategy (Otto & Pensini, 2017).

Lapland's tourism policy, according to the Regional Council of Lapland, intends to become Europe's leading destination by 2020. Furthermore, their financial goal is to increase their existing customer base by 2020. (Regional Council of Lapland, 2011, p. 13). However, uncontrolled tourism construction and increasing traffic tend to damage nature, which is sensitive in the Arctic region (Grimwood, 2015). Hence, the rapid development of tourism raises government and residents' concerns about maintaining regional natural landscape while expanding the resorts. The environment is considered as a vital support for the development of tourism. The significance of environmental education is to help individuals and society understand the interaction between their environment and social culture. More importantly, environment education directly or indirectly affects tourists' environmental behaviour and foster awareness of environmental issues caused by tourism. For example, effective environment education encourages tourists to consciously arrange a tourism activity schedule to maintain the local natural environment. Therefore, environmental education for tourists is necessary for the sustainability of a region's tourism and environmental sustainability. Following this, the sensory design incorporates the idea of service design to create a user-centred experience and to raise users' awareness for the cultural heritage of Finnish Lapland and environmental awareness.

2.6.1 Sustainable Development Education

The World Conference on Education for Sustainable Development was held in Japan in 2014. "Shaping the Future We Want—The Final Report on Monitoring and Evaluation of the United Nations Decade of Education for Sustainable Development (2005-2014)" was published at the meeting (Nations, 1987). Countries all over the world have summarized the experience and lessons learned in promoting education for sustainable growth, and the future of education for sustainable development has been expected, causing major implications in the global education sector and serving as an important reference for countries formulating education policies and reforming education. On May 19-21, 2015, the World Education Forum was held at the Songdo International Convention and Exhibition Center in Incheon, South Korea. With the theme of "Changing Life Through Education," the World Education Forum adopted the "Incheon" that established new global education goals in the next 15 years. The Declaration, which firmly supports the "Global Action Plan on Education for Sustainable Development" initiated at the Global Conference on Education for Sustainable Development, and emphasizes the importance of human rights education and training.

2.6.2 The Effect of Sustainable Education

At the stage of primary education, Finland sets the goal of education for sustainable development as raising students' environmental awareness and is committed to a sustainable lifestyle. Students must be able to perceive and recognize changes in humans and the environment (Gadotti, 2008). Regional and international consequences, develop students' critical and creative thinking, and give students opportunities to participate, experience and take responsibility, help students cultivate awareness of sustainable development during the learning process, and promote global environmental changes such as the global warming Strategy.

Under the influence of COVID-19, measures taken by other countries to promote the development of tourism:

Taking China as an example, under the current impact of COVID-19, the Chinese government took the initiative to adopt effective support policies for the tourism industry promptly (Dan, 2020). For example, local tourism companies are guided to contribute to the joint prevention and control of the epidemic in terms of capacity supplementation, accommodation guarantee, venue provision, and safety management. Secondly, government funds invest in the tourism industry to promote online tourism service levels to make it more convenient. After experiencing the influence of technology changes in communication, the popularity of 5G and the ubiquity of smart phones have allowed the rapid development of China's "travel + Internet", which has led to the continuous emergence of enterprises for online travel service (Hoque et al., 2020). Therefore, at the beginning of the outbreak of COVID-19, its impact showed two sides.

On the one hand, due to the high online reservation rate, more "refund, change and stop" orders need to be processed. On the other hand, it also shows the advantages of online travel services. Although the "refund to suspension" business is widespread, many travel companies can persist in taking responsibility and orderly respond to and handle related businesses, ensuring consumers' interests. In addition to online travel companies that provide professional or even refined travel services, many online platform companies provide life services that have touched the travel service business, making the travel industry respond to COVID-19 this time. In the process of the COVID-19 crisis, the tourism industry was more active and promoted cultural communication due to its diversified business scope (Li, 2021).

2.6.3 Education for Sustainable Development in Finland

In the study "Our Common Future", the World Commission on Environment and Development described the principle of education for sustainable development (ESD).

"In the technological, environmental, and social growth sectors, education for sustainable development is focused on natural science and social science approaches. The foundation, which was built on a number of similar topics such as democracy, gender equality, and human rights, laid the groundwork for contemporary environmental education"(Taylor et al., 2020, p.2). Finland's work in education for sustainable development has effectively responded to the United Nations' demand as a representative of high-quality education in Northern Europe (Peña-López, 2015). From the national level, the reform promoted by the government from top to bottom has achieved good results after more than 20 years of development (Åhlberg et al., 2015). In 1993, the National Council for Sustainable Development was established to strengthen cooperation in sustainable development. In addition to its outstanding performance in PISA and attracting the world's attention to its education, Finland has also been actively developing education for sustainable development; that is, the government takes the lead in driving schools, enterprises, non-governmental organizations, and other sectors of society are concerned about sustainable development education (Jeronen & Raustia, 2009).

The most popular tree model was created by Finnish academics to lead the creation of school curriculum for the country's sustainable development education. The tree trunk in this model symbolizes that the impact of the sustainable development concept on education is being generated and has a gradual growth trend (Pressley, 2020). The branches and leaves are composed of three core concept groups, namely "education about the environment," "environmental education," and "education in the environment," the three related education contents are natural science, morality, and aesthetic education. The three kinds of education intersect and blend to form a more core idea: learn to care and learn experience, learn to act, and finally return to the three core abilities of students: knowledge, skills, and emotions.

2.7 A Gap in the Research

Tourism depends directly on environmental quality to provide sceneries and products, attract tourists and grow the economy. However, Large-scale tourism has a hard time meeting the requirements of sustainability, because pollution, waste generation, and land degradation would happen in overpopulated destinations (Liu, 2019, p.7-13).

Previous studies confirmed that managing tourists' behaviors can minimize the adverse environmental and social impact in Finnish Lapland (Lee & Moscardo, 2005). Meanwhile, environmental education has presented its outstanding value in sustainable development (Elliott, 1999). However, research on the integration of environmental education and tourist management is not sufficient, especially research on the application of environmental education to cultural communication in tourism is quite limited.

Specifically, researchers are inclined to attach great importance to the content of environmental education rather than the acceptance of tourists. However, the methods of communication and user's experience of communication are both significant factors that determine users' understanding degree. Because when knowledge and senses are not connected, it is abstract and difficult to absorb (Fan & Xie, 2017), and this area need more study.

Therefore, this study is committed to integrating environmental education into the tourism industry for communication, aiming at promoting environmental sustainability as well as enhancing the user experience of cultural communication in the form of sensory design, thereby deepening the user's absorption level and the impression of travel destinations.

In addition, cultural transmission is mutual. In terms of service design thinking, this means that local stakeholders in Lapland are as significant as the needs of tourists. In

fact, the research on tourism experience can be traced back to the sociological research of scholars. For instance, Boosting (1964), MacCannell (1976), however, more research concentrates on the relationship between tourist experience and economy, to achieve sustainable economic benefits through better resource allocation (Marcotte et al., 2017). Meanwhile, the research from the perspective of tourists and locals is still limited, especially the tourism experience mostly aims at tourists whereas the demand for locals is less involved. Therefore, this research also focuses on exploring the needs and experience of local people for cultural communication to make up for the lack of literature.

Overall, this research attempts to integrate the concept of environmental education into the tourism industry for cultural communication and enhance the cultural experience through sensory design. Due to its wide range, the insufficient aspects in the literature review will be supplemented by practical research, and the methodology and research process of this research will be explained in Chapter 3.

Chapter 3. Methodology

This study is a qualitative research based on interpretivism as the paradigm, taking traditional ethnography and design ethnography as research strategies to carry out three phases of research. The data were collected by field studies, semi-structured interviews and workshops, organizing in the form of visual notes, images, and texts. The data were organized in theme and analyzed by content, then correlated with literature review. This chapter will discuss the reason for the choice of paradigm, strategy, methods for data collection and analysis, along with how they are used in this study.

3.1 Research Design

Muratowski described methodology as a “toolkit” that can find corresponding methods (Muratowski, 2015, p.34-35). It is like a road map, and one can work out several routes and methods to get to the destination (Crouch & Pearce, 2012, p.54). The research questions are as follows:

Research questions:

How can design promote cultural communication in tourism to promote sustainable development?

1. In an unprecedented situation like the COVID-19 pandemic, what design opportunities are suitable for cultural communication in tourism in Finnish Lapland?

2. Regarding the Finnish Lapland region, especially Rovaniemi, what are the needs and challenges of cultural communication in tourism?

3. How can design play a role in cultural communication in tourism?

i. What role can service design play in cultural communication?

ii. How does sensory design enhance the user's experience of cultural communication?

Based on the research questions, this study consists of three phases, as is shown in the figure below (Figure_3). Ethnography is used as a research strategy. Phase 1 and phase 2 are designed to approach research question 1 and research question 2. In these two phases, traditional ethnography is adopted, namely to collect data through conducting field study, semi-structured interview, and workshop. Art-based methods such as photo collage are supplemented to increase the comprehensibility of the data. In phase 3, design ethnography was used to answer research question 3. This study uses the design outcome to carry out tests on users and acquire data about users' experience on Finnish Lapland's cultural communication design products in tourism, and to explore the effect of design in cultural communication in tourism. In the data analysis stage, content analysis and thematic analysis are selected as the analysis methods to generate a deeper understanding of the research question.

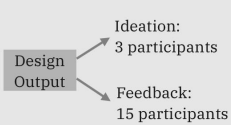
Research Phase	Sample	Strategy	Method	Data collection	Aim
Phase 1	ARCTISEN Project: 15 participants	Ethnography	Semi-structured Interview Field study	Video and audio recording Observation, Photo Text and diary	To answer research question 1 and 2
	Online Interview: 12 participants		Semi-structured Interview	Audio recording Text	
Phase 2	ThinkARTant Project: 12 participants	Ethnography	Workshop (with art-based method) Tools: Photo colleges, Maps	Audio and video recording Visual text Observation Photo	To answer research question 2 and 3
Phase 3		Design Ethnography	Workshop (for ideation) Tools: Role-playing	Audio recording Visual text and notes	To answer research question 3
			Semi-structured Interview	Audio recording Text and notes	

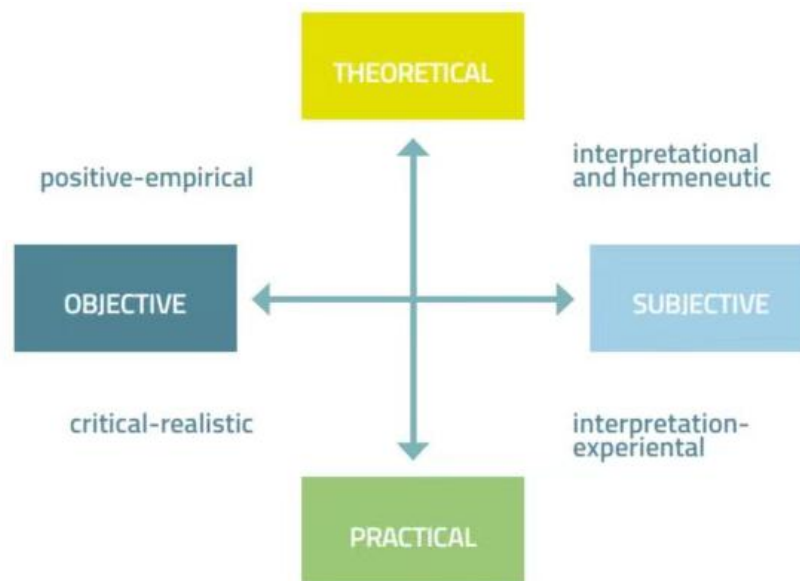
Figure 3. The methodological classification of this study

3.2 Research Philosophy

This study takes interpretivism as the paradigm. According to Lecompte and Schensul (2010), interpretivism is participatory, requiring researchers to intervene in the life of the research object to gain insights. interpretivism believes that " *reality exists in everyone's mind* " (LeCompte & Schensul, 2010, p.64). Every individual has different thoughts, they may have different views on the same event. And this research needs to collect different people's views and experiences on cultural communication. The

purpose of this research is to explore an applicable way for Lapland's tourism in cultural communication through design. This study requires excavation and understanding the needs of Lapland residents in cultural communication, as well as exploring potential tourists' feelings about cultural communication in tourism through design.

Interpretive scholars believe that constructs may change due to different circumstances, and this will lead to new constructions, new experiences, and actions (Nastasi & DeZolt, 1994), so I take design ethnography as my strategy. Design ethnography is constructed by design to gain feedback given by people in new situations (Müller, 2021, p.25-26) and my study was to see how design will contribute to cultural communication in the tourism industry, and gain more knowledge and insight.



*Figure 4. Pirkko Anttila's double dichotomy of research approaches
(Anttila, 2007, p.23)*

According to Anttila's double dichotomies of research approaches (Figure_4), I divided my research objectives into critical-realistic fields, aiming at collecting participants' information to provide better practice. This study focuses on collecting the experience of others on cultural communication in tourism, including the experiences and views of

relevant stakeholders in Finnish Lapland, especially those of local residents, as well as those of the potential tourists who have not been to Lapland. This study also targets at generating experience by studying users' experience of design outcome, to create a better tourism experience in the future.

3.3 Research Strategy

Ethnographic research is chosen as the research strategy. Specifically, traditional ethnography and design ethnography are adopted in the study. Design ethnography is often used by designers to acquire user experience efficiently, and researchers also use this method to investigate and understand specific groups (Veggel, 2005, p. 5). The two have different focuses: while one focuses more on acquiring knowledge, the other is more inclined to acquire experience and improve a certain practice. My purpose in using ethnography is to obtain user experience to find the best practice and also to answer the research questions through design. Therefore, both traditional ethnography and design ethnography are adopted, as the research tries not only to understand the residents of Finnish Lapland but also to explore the potential tourists' experience on the design of Lapland cultural communication.

Ethnography is contrast with the normative research in due form, but it advocates investigating people's understanding of their own world in a natural state under observation (Agia, 2011). Ethnographic research originated from anthropology and sociology at the beginning of the 20th century. It is suitable for comprehensive analysis of cultural life of a particular race (Hammersley, 2016). This study also refers to the content of ethnographic research, with the purpose of understanding and describing Lapland culture in a more natural environment by participating in observations and interviews. Ethnography can be used to study the customs of specific groups, and it is suitable for designs that are created when customs changes (Muratovski, 2016, p.101). Thus, ethnography is expected to help to better understand the local culture and generate design hypotheses. Fals-Borda (1987) once used ethnography to investigate the culture

of a region and its residents and drew up plans that can be used for cultural communication (LeCompte & Schensul, 2010, p.61-62). Similarly, ethnography also useful for my research.

The study team consists of members with different professional backgrounds and age groups. Members with different professional abilities have practical experiences and thinking models in their respective fields, meaning that there may be views from different perspectives in the team, which would help with studying Lapland cultural ethnography (LeCompte, 1999). In brief, increasing diversity may improve the overall performance of the team. Therefore, this research will invite people with different backgrounds to form a human research team, because unlike in a homogeneous team, the conflict of opinions between team members in such a diversified team might stimulate more incredible innovations. In addition to team diversity, this research also pays attention to the diversity of participants. This is especially important in countries or societies where the expectations and roles of people of different genders and races are considerably different.

During the field study in ARCTISEN project, ethnography is adopted, which informing design with holistic potential research from observing people's daily life (Agia, 2011). Through going to the local gathering place, having breakfast with the hotel owner, visiting the museum and second-hand market, we try to get involved in the local life. An in-depth observation of Hetta was taken, and we have had a deeper understanding during the second field study to Hetta. I also applied the empathetic approach, namely to consider motivations, emotions, worldviews from the perspective of other people (McDonagh, 2006), through which one can enhance the understanding of local culture.

Design Ethnography

Design ethnography, by understanding the daily life and behavior of a specific group of people through "artefact" , increases the probability of the success of a new product or

service (Salvador et al., 1999, p.37). The design outcome generated in the current research, as a kind of "artefact" (Salvador et al., 1999, p.37), aims to obtain the experience of non-Finnish potential tourists on cultural communication products in tourism and to find answers for my research questions. According to Segelström and Holmlid (2015), when using design ethnography, it is necessary to use multiple methods like using traditional ethnography to prevent the researcher from being too subjective, which can affect the research results. Therefore, in the process of my design, workshops are conducted, tools like role-playing and ideation sessions are applied, and semi-structured interviews are conducted to collect feedback when testing my design outcome.

3.4 Methods for Data Collection

Qualitative research methods were used in this study for collecting data, including semi-structured interviews, field study and workshops.

Semi-structured Interview

Semi-structured interviews are hybrids of structured and unstructured interviews, and they are more versatile than structured interviews. Therefore, researchers need to determine the critical topics of the research and formulate an interview guideline (Leech, 2002). Without a large amount of data support, the effect of the questionnaire will be limited. The questionnaire itself has disadvantages such as answers being too simple, so it needs to be supplemented with the interview (Robson, 2002). Therefore, the interview is selected as the way to collect information. There are many forms of interview. A structured interview may bring overly rigorous results, while answers in an unstructured interview tend to be casual (Kothari, 2004, p.97-99). In comparison, a semi-structured interview is able to get more users' experience and information (Longhurst, 2003, p.143). It is required that the interviewers invited in this study deal with the situation flexibly to obtain more realistic interview data results (Newcomer, 2015).

According to Wilson (2013, p.30-32), there are three steps to conduct semi-structured interviews. First, determine the research focus, then determine the question structure, and finally formulate a table containing topics, introductions, and general questions based on the question structure. In the process of the interview, my team and I initially planned the basic questions that need to be asked, laid out the way of asking and answering, and tried to be more flexible in the process of obtaining information, for example, by adding or deleting questions according to the answers and status of the participants. The interviewer needs to make necessary adjustments according to the actual situation during the interview (Longhurst, 2003). Therefore, I have paid more attention to the sympathetic dialogue mode as much as possible in the interview. This kind of research method is adopted in both ARCTISEN project, online interview, and test phases, and there are a large amount of data and user experience are obtained.

Workshop

Workshops are usually short and intensive projects aimed at a small group of people, focusing on the technology and skills in a particular field. Rooted in participatory design and user-centred design, a workshop aims to involve stakeholders in the early stages of the design process (Steen, 2011). Participants build ideas together, which can bring them a sense of control and a sense of freshness that is different from their daily work. (Nargis, 2012). Based on the idea that everyone can be creative, one's participation experience can vary from informing the project to playing the role of "user as a partner" in the design. It is a tool for discovering and exploring opportunities, not a final solution. It aims to initiate discussions among stakeholders and guide design decisions.

There are different tools and methods available in the workshop. In the research, two workshops were conducted. The workshop in Phase 2 used an art-based method to visualize the needs and help our team to gain insight from relevant stakeholders. The role-play method was used in Phase 3 to enhance users' participation. With the help of

workshops, this study can refer to practitioners' ideas in various business fields (Steen, 2011).

Field Study

According to Burgess (2002), field research is a general method used by researchers to collect data about users, user needs, and product needs. This method includes interview, observation, and experimental methods.

Observation method refers to a method in which the investigator observes and records the investigator's situation from the side to collect market conditions. The observation can be direct or indirect. Direct observation: researchers collect data through observations in the natural environment. The researcher is just an observer and will not interfere with the research objects and their environment. The advantage of direct observation is that it can provide background data about people, situations, and surroundings. This method is widely used in public places or environments. Participatory observation method: the researcher is no longer a mere observer but a participant. Researchers need to be deeply involved in the research process, have discussions with the research object, and guide the discussion direction. In this method, the researcher and the research subject have an in-depth discussion in a comfortable environment (Burgess, 2002). In this study, direct observation and indirect observation were used in each phase, and field studies were conducted in the ARCTISEN project to generate a deeper understanding of Finnish Lapland.

3.5 Research Activity

The data were collected from 57 participants in the whole research process. The specific collection process and tools for each phase are as follows:

Research activity of phase 1

Research Phase	Sample	Strategy	Method	Data collection	Aim
Phase 1	ARCTISEN Project: 15 participants	Ethnography	Semi-structured Interview Field study	Video and audio recording Observation, Photo Text and diary	To answer research question 1 and 2
	Online Interview: 12 participants		Semi-structured Interview	Audio recording Text	

Figure 5. The methodological classification of phase 1

In the ARCTISEN (Culturally sensitive tourism in the Arctic) project, my team and I conducted two field studies, once in February to March 2020, once in October 2019. During the second field study, semi-structured interviews were conducted. There were 15 main interviewees, who were residents of Enontekiö, staff from Nature Center, municipalities, managers of local enterprises, owners of local hotels, tourists from Germany, Britain and Russia, and artists participating in ice sculpture competitions.

Our team jointly determined the questions of the semi-structured interview. And during the interview, based on the interviewer's situation, added or subtracted questions accordingly.

In order to understand the local cultural communication in tourism and the state of ecologically sustainable development, we asked the following questions:

1. *Why do you think people (Finnish and international tourists) visit Hetta/Enontekiö?*
2. *Are you satisfied with the current tourist situation in the municipality? Are you happy with the number of tourists?*
3. *What kinds of actions have been taken for the development of tourism in the area? Who were the target groups? What channels were used to promote tourism?*
4. *What are the current cultural activities? How do you think this will help the tourism industry?*
5. *What is the best contribution that a tourist can make to cultural events?*

6. *What aspect do you think Enontekiö should be most proud of? Or what kind of impact do you hope to bring to tourists?*
7. *Is there anything you wish tourists to keep in mind while in Enontekiö?*
8. *Is there any place you would say is a “best practice” of tourism in Northern Europe?*
9. *Do you think some aspects of tourism could be improved?*
10. *What kind of tourists are most satisfying to you?*
11. *What do you think of the sustainable development of the local ecology? What do you think is the relationship between ecology and tourism?*
12. *How do you see Enontekiö’s tourism in 10 years?*

To supplement the tourist data in the ARCTISEN project and to further answer research questions 1 and 2, I conducted semi-structured interviews with potential tourists who were not of Finnish nationality and had not been to Rovaniemi, Finland from December 2020 to January 2021. However, due to the outbreak of the COVID-19 pandemic during this period, the research was only conducted online.

The main research objects of this survey are potential foreign tourists of non-Finnish nationality. The selection criteria of the research objects are (1) have not been to Finnish Lapland (2) interested in tourism/have at least one travel experience within a year (3) interested in non-national culture. Interviewees were found and selected through snowball sampling.

Interviews were mainly one-on-one interviews, and occasionally they were conducted online, each time about 15 minutes of interviews. A semi-structured question-and-answer method was adopted. A total of 12 participants in this interview were of Chinese nationality, aged between 20-53, all of whom were potential users.

The interview questions are composed of three sections in order: the basic situation / the level of understanding of Finnish Lapland, channels used to understand tourist

destinations / how to conduct tourism planning, how to treat cultural communication / some examples of cultural communication that you think is excellent.

Research activity of phase 2

Research Phase	Sample	Strategy	Method	Data collection	Aim
Phase 2	ThinkARTant Project: 12 participants	Ethnography	Workshop (with art-based method) Tools: Photo colleges, Maps	Audio and video recording Visual text Observation Photo	To answer research question 2 and 3

Figure 6. The methodological classification of phase 2

Participants

There were 12 participants in the ThinkARTank workshop invited by group member Marrit and our supervisor Melanie. Four of them were students, who came from uni Lapland and lapin liitto, three participants were from Rovaniemi municipality, three were from Inhabitants association, and the other two participants were local artists. Nine of them were local inhabitants, and the other three were from Germany, China, and Pakistan.

Workshop with art-based methods

Due to the pandemic, we conducted the workshop online. To communicate effectively, we used an icon bank, a collection of icons that could be easily selected by the user, which saved time and assisted participants to express their ideas precisely.

First, we added a pre-task to the participants before the start of the workshop, inviting them to provide us with photos or videos to conduct a user pictures interview. That was a combination of photo ethnography and ethnographic interviews (Kumar, 2013, p. 290), enabling information to be gathered when the participants were talking about the photographs taken.

The questions we used in the pre-task are the following ones:

- *Where is the place in which you can dream and imagine the future?*
- *Where is the place in which you can experience feelings of hope and optimism?*
- *Where is the place in which you can be yourself, reflect, and think?*
- *Where is the place in which you feel happy and satisfied?*
- *How does this place look? Can you imagine this place, see it, feel it, smell it, or touch some objects within it? Where are you?*
- *If you could go to this place in Rovaniemi, where would you go?*

This art-based method can well bring the users into a specific scenario and help them understand it through visual elaboration. The Pre-task was sent to the participants' email addresses in the form of an invitation, as is shown in the figure below (Figure_7).



Figure 7. Invitation letter from the ThinkARTank team

The specific process of the workshop is as follows:

We devised the structure of the workshop based on the double diamond model (Design Council, 2019). To begin with, we invited each participant to introduce themselves and briefly present their pre-task photos in an icebreaker session. Then, due to time constraints, we divided the participants into three groups and conducted the same workshop process in each group at the same time.

Firstly, in the discovery phase, we invited each participant to create their pre-task pictures, and they could choose to draw or use icons to express their ideas. This process helped users to think deeply about the areas they showed deep concern about. In addition, since the photos that the participants were asked to submit in the pre-task were taken at the closest views that they were satisfied with, they would get a perfect view if they continued to improve on that basis. The data obtained at this stage are shown below (Figure_8), and only the pictures of two participants are shown here.

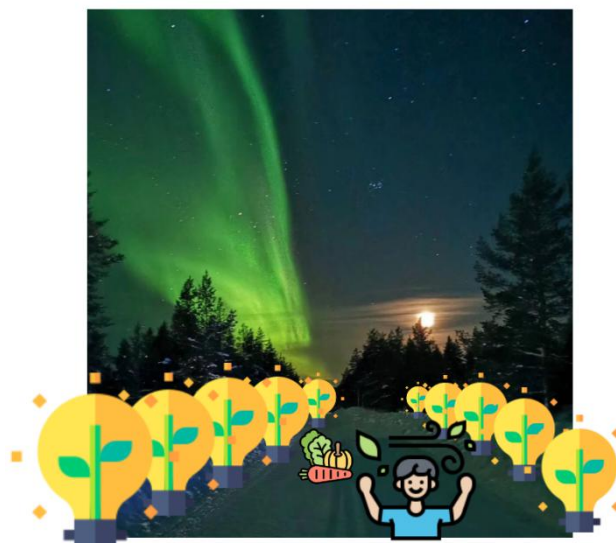


Figure 8. Photo collage about “Dream Future of Rovaniemi” from participants in the ThinkARTank workshop

At the end of the mapping, each participant explained their works. After each work was presented, all participants in each group worked on the need map according to the creator’s description. The session went smoothly because the visualization helped other participants and researchers to understand what one tried to express in one’s work. The participants worked together and brainstormed ideas, which helped to define the key requirements quickly and make the needs map better. By drawing the needs map, the participants' requirements were also specified and textualized.

For the define stage, according to the needs map that reflected and summarized one’s

needs, participants could filter the part of the needs with the value from their own interests and experience perspective, and draw the value map. At the end of this session, each participant generated his or her own needs map and value map. Maps of two of the participants are shown in figure below (Figure_9).

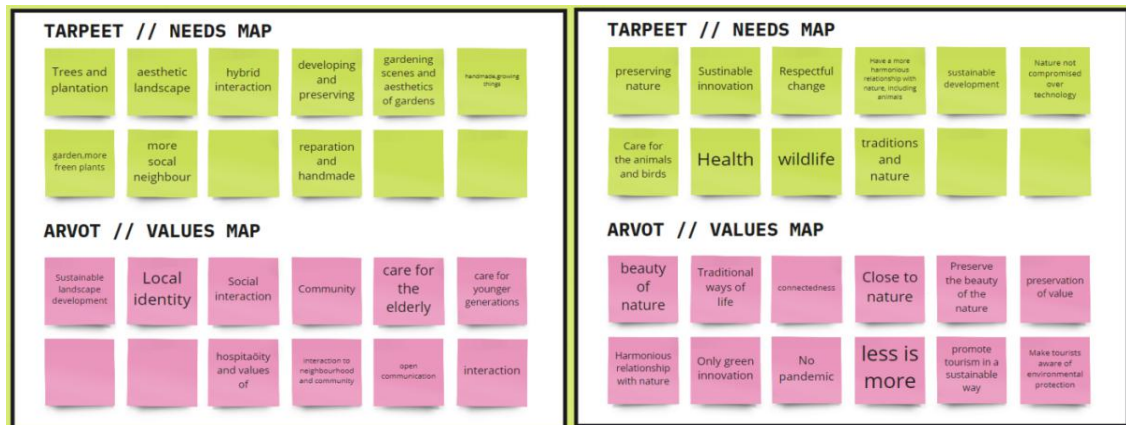


Figure 9. Needs map and value map from participants in ThinkARTank workshop

In the develop phase, we invited participants to explore the solution by sending postcards, and the results obtained are shown in the figure below (Figure_10). Through each participant's presentation of the postcard they drew, each group discussed and selected the best vision.



Figure 10. "Postcard for Future" from participants in the ThinkARTank workshop

In the delivery phase, each team drew a tree diagram, which was suitable for systematically analyzing the hierarchy between entities (Kumar, 2013, p. 397). In the diagram, the best vision will become the trunk, and the people, resources, and actions will become the leaves. This step can refine requirements, relevant stakeholders, solutions, and possible problems to figure out how this conception could be implemented to the grass-root level in Rovaniemi. The data obtained at this step is shown in figure below (Figure_11).

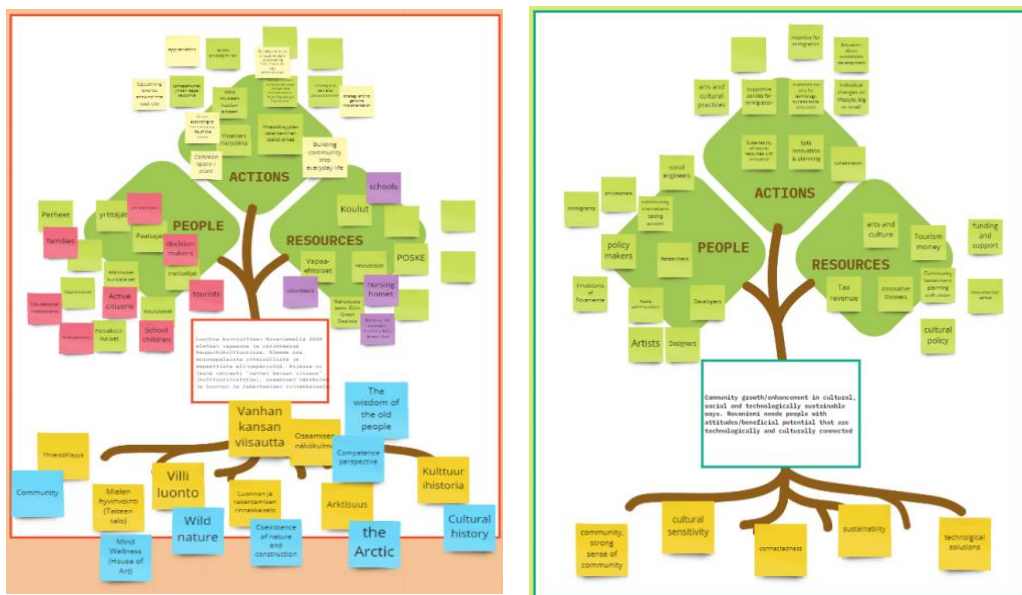


Figure 11. Tree maps from participants in the ThinkARTank workshop

Research activity of phase 3

Research Phase	Sample	Strategy	Method	Data collection	Aim
Phase 3	Design Output <ul style="list-style-type: none"> → Ideation: 3 participants → Feedback: 15 participants 	Design Ethnography	Workshop (for ideation)	Audio recording Visual text and notes	To answer research question 3
			Tools: Role-playing		
			Semi-structured Interview	Audio recording Text and notes	

Figure 12. The methodological classification of phase 3

In Phase 3, three stakeholders were invited to participate in the workshop to generate ideas, and then semi-structured interviews were conducted with 15 participants after the

design outcome was generated. The interview aims to investigate the experience that design outcome brings to the participants. Three of these 15 participants had actual experience of the design outcome, and the other 12 people only provided some information on their visual experiences and hypothetical answers.

During the ideation process of the workshop, I invited three stakeholders. One of them was an online store owner who had been operating a store on Taobao for 2 years. The other was a tourist, or a potential user, as he was keen on traveling but had not been to Rovaniemi yet. The third participant was a Chinese university student majoring in sales, and he had lived in Rovaniemi for eight years.

The ideation session was more structured than the traditional brainstorming session, and it was based on the logic and framework generated in the research. (Kumar, 2013, p.523) The first step of this workshop was to generate as many ideas as possible within a time limit of 50 minutes. As is shown in the figure (Figure_13), 32 ideas were generated above the dividing line. After that, we did a role-play ideation, as role-playing may bring new insights into the research process and raise the research to a new level (Simsarian, 2003, p.1012). And then, we conceptualized the ideas by assuming that we were the other stakeholders (Kumar, 2013, p. 542) and generated 15 more idea under the dividing line, as is shown below. After the ideation, the participants' ideas were categorized by topic, as is shown in the figure below (Figure_14).

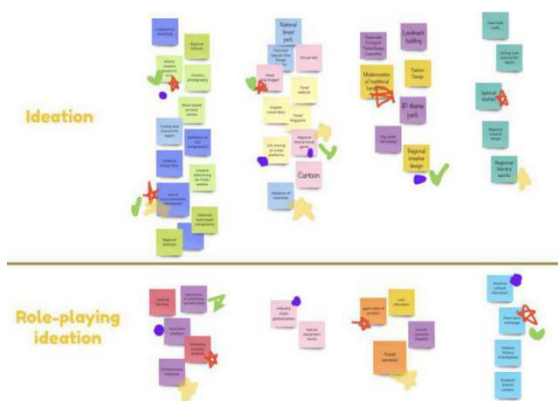


Figure 13. Ideas notes from participants in the workshop

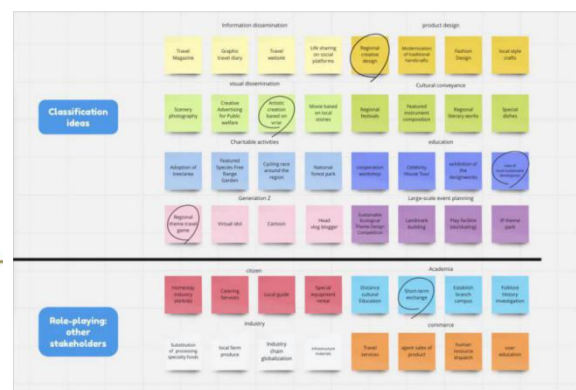


Figure 14. Ideas notes organized by theme from the workshop

I combined the voted top six ideas with the descriptions of the participants, and then summarized them as presented below:

Idea 1: Carry out study tours for sustainable development education, which are similar to exchange learning, and share exchange experiences between users and potential users, so as to promote cultural communication in tourism.

Idea 2: Place digital screens in squares with a large number of people to realize instant communication between Finnish Lapland and other countries, with the help of virtual reality technologies such as AR and VR.

Idea 3: Finnish Lapland should establish an official website or shop on a well-known and commonly used platform in the world, carry out cultural communication, and launch-related products.

Idea 4: Carry out themed activities during Christmas, Global Environmental Day, or the Environmental Summit.

Idea 5: Let potential users experience the tourism culture and tourism environment of Finnish Lapland in advance through virtual techniques, such as developing games containing cultural elements and value of Lapland and publishing them in other countries, or shooting experiential and interactive videos or movies.

Idea 6: Cooperate with foreign companies to communication products relevant to sustainable education to other countries.

Then I evaluated these six ideas and scored them in the directions of innovation, environmental education, function, embodiment, feasibility, culture communication, cost, and sustainability (Figure_15). The scoring result is shown in the following chart. After context analysis, I optimized the ideas and generated design Criteria. In the process of generating the design outcome, I kept in touch with the participants to make sure that the design could be modified in time.

Concept Screening/ Concept Variants						
Selection Criteria	1	2	3	4	5	6
Innovative	+	0	0	+	0	+
Environmental education	+	+	+	+	+	+
Function	+	0	0	0	0	+
Embodiment	-	+	-	0	+	-
Feasibility	0	+	0	0	0	0
Culture export	0	+	-	+	0	0
Cost	0	0	0	-	0	+
Quality/Sustainability	+	0	0	0	0	0
+	4	4	1	3	2	4
0	3	4	5	4	6	3
-	1	0	2	1	0	1
Net	3	4	-1	2	2	3
Rank	2	1	6	4	4	2
Continue?	No	No	Yes	Yes	Yes	No

Figure 15. Concept screening model drawing on Kirk Martensen, Goldmarks Co, 2002. Score: (“+”= Valid for the subject; “0” =Invalid for the subject;“-”=Harmful for the subject)

Semi-structured interviews were conducted after the design was completed. Firstly, I posted information on WeChat and Xiaohongshu to find voluntary testers. After 12 days, I got feedback from 15 people, among whom 14 were Chinese, and one was French. There were 10 females and 5 males. Due to time and budget constraints, I conducted semi-structured interviews with the 15 people and only chose 3 of them for the actual test, all of whom were Chinese, 2 females and one male. The materials of the design outcome were expressed to the three participants, and I conducted semi-structured interviews with them after they experienced the design outcome.

The semi-structured interview questions are composed of four topics in order:

Experience in cultural communication: *what are the feelings that the product brings to you? What kind of experience does it bring to you in terms of culture? What message can this set of products convey to you? Can sensory experiences promote your perception of cultural information?*

Cultural communication in tourism: *In what form(s) do you prefer to receive tourism*

information? What ways of conveying cultural information of travel may appeal to you?

About the product: 1. How did it feel to make this work? 2. Do you want to buy this series of products? List two advantages of the product. 3. List two shortcomings of the product.

About Finnish Lapland: Will this set of products stimulate your desire to know more about Lapland? 2. Do you think this series of products increase the possibility of going to Rovaniemi, Finnish Lapland?

3.6 Data Analysis

Since qualitative research emphasizes the depth rather than the breadth of a topic (Leavy, 2015, p. 8), this study adopted qualitative analysis as the main analysis method. In the research of Denscombe (2010, p.132-135), what it advocates is also to analyze the deeper value of the topic from data such as texts and images, and to add its own understanding based on evaluating and comparing the data, so that it can better serve the research purpose. Among various methods of qualitative analysis, I have chosen content analysis and thematic analysis.

Thematic analysis

The purpose of thematic analysis is longitudinal analysis in a certain field, and it is an in-depth topic analysis in qualitative research (Belotto, 2018). Thematic analysis has a flexible theoretical framework for researchers to use, which is easy to grasp. Due to its adaptability, thematic analysis presents the data in a comprehensive, concrete and rich way, and the complexity of content analysis can be reduced after thematic analysis. In this study, thematic analysis is used to find the demand correlation between different stakeholders on the same theme. The search for design through the exploration of similar needs is also conducive to balancing the conflicts between different stakeholders.

Content analysis

Content analysis is a rule-guided method used to analyze the information content of text data (Mayring, 2000). It is necessary to exclude personal subjective colors to conduct content analysis, and treat all relevant data as an organic whole. Qualitative content analysis is one of the analysis methods to analyze text data, focusing on reducing it into manageable parts by applying inductive and/or deductive codes and reorganizing the data to draw and verify conclusions (Miles & Huberman, 1994). It is a general form of data analysis because it consists of a set of theoretical techniques that can be used for any qualitative investigation related to the information content of the data. The qualitative content analysis focuses on generating theoretical opinions rather than focusing on the specific information content of the data.

Content analysis in qualitative analysis is defined as a way to reduce or simplify the data and help researchers to understand it (Julien, 2008). In this study, content analysis is adopted, and a Venn diagram was used to visualize similar topics, as analyzing these clustering patterns can help the researcher understand the themes and facilitate concept generation (Kumar, V, 2013, p.351). More over, when sorting out interview information, correlation analysis was used to code and classify the information, although correlation analysis is more frequently used in quantitative research, but it is a good way to organize data with content analysis to improve the efficiency of analysis.

3.7 Ethical Consideration and Data Validity

This research included 57 participants. Each time before obtaining data from the participants, the participants were informed of the purpose and nature of the study. After obtaining the consent of the interviewees, the interviewees would sign an Informed Ethics Application Form.

This research includes various analysis methods and data from primary sources to secondary sources. The interview records and data of the workshops were collected within 72 hours and kept anonymously. The data is stored in the form of coding and classification, and analyzed according to the content. In the process of analysis, I constantly reflect on my role to remove subjective factors, and deliberate on the details with the team members to ensure the reliability of the data. Besides, combine the data generated by analysis with the results of literature review, establish an innovative argument, and prove the reliability of personal opinions through the first-hand data obtained in the interview.

Chapter 4 Findings

In this chapter, I will introduce the two main projects that provide data for this study. The collected data were integrate with the literature review, and fill in the gaps in literature to answer the research questions. The two main projects are ARCTISEN and ThinkARTank. In Project ARCTISEN, my team and I conducted field study and semi-structured interviews for Enontekiö, the data mainly focused on the views of relevant stakeholders on culture communication and ecological sustainability. In the ThinkARTank project, my team and I held an online workshop, the data mainly focused on using art-based methods to find the direction of sustainable development for Rovaniemi in the future.

4.1 ARCTISEN Project

ARCTISEN is a project funded by the EU provided a brief of Culturally Sensitive Tourism in the Arctic, aims to “support a system for start-ups and existing small and medium-sized enterprises offering innovative tourism products and services in the Arctic”. My team and I joined ARCTISEN as a student group.

Our group members are Emmanuel Tauch, Misia Sennicka, Chau-Hsien Kuo, Yiheng Gu and me. All of us are from master program of Arctic art and design in Ulapland. Personnel of the University of Lapland are the most important supporters to us. In the research phase, our supervisor Suvi Autio from the university helped us to get all needed support, including equipment for the filming work such as cameras, drone, microphone, also she contacted with the personnel of local organizations that we planned to conduct the interviews, managed the project timetable, and drove us to Enontekiö. She made us operate the project without obstacles. Tanya Kravtsov who was the lecturer of the Arctic Art and Design course was the other supervisor of us in this project. She worked as the lecturer and observer of this project. She joined each meeting, came up with the initial idea of the project with us.

The aim of the project is to inherit sustainable development of the economy, culture and ecology. The plan of this study focuses on the aspect of the sustainable development of the ecology that can give the young generation the awareness and establish a mindset. We plan to organize a virtual NISC (Nordic Ice Sculpture Competition) workshop in which Minecraft will be applied as a media where participants can remotely visit the highlight of the Enontekiö as well as gain the knowledge of the sustainable development of the ecology at the same time. As Minecraft has their educational version, we believe that the gaming platform can bring educational significance while motivating people's interest in traveling to Enontekiö. Although the seminar was not implemented due to the epidemic, the field survey and interview data still have research value.

The stakeholders of this project are Municipality of Enontekiö, Nature Center, local enterprises, local hotels, tourists(participants), ARCTISEN, University of Lapland, ARCTISEN team, and corporate partners. The Municipality of Enontekiö can acquire fresh ideas from the competition. The awareness of sustainable tourism and cultural sensitivity can be conveyed to tourists(participants) through the virtual NISC.

4.1.1 Significance of ARCTISEN Project for This Study

I plan to answer the sub-question 1 and 2 through this project, in order to find a design opportunity suitable for Lapland's cultural communication in tourism, and to explore the needs of relevant stakeholders for cultural communication in tourism. The team joined ARCTISEN and went to Enontekiö twice for research. Through field research and semi-structured interviews with tourists, locals, artists, and municipalities, preliminary insights on the question were generated, and the data was sorted and coded through content analysis, and compared with existing literature.

Data Sources

The data comes from audio recordings, video recordings, photos, notes and focus group discussions. During the interview, the interviewer was taped and notes were recorded,

during which the interview process was video-recorded. All data obtained the consent of the interviewer, signed a contract, and will use an anonymous form in the use of the data.

4.1.2 Analysis of Field Research in ARCTISEN Project

As a research method, ethnography is to observe participants in the natural state, rather than inquire in a pre-arranged state. For the research team, the benefit of ethnography lies in a more comprehensive and in-depth study of user performance and experience in daily life. This helps the observer to gain a deeper understanding of the user's own understanding of the surrounding environment and their own lives (Agia, 2011).

Our team observed the local residents and tourists by integrating into the local life and obtained a lot of useful information. We conducted two field surveys on Enontekiö, and the first time we mainly communicated with the hotel owner of “HotelliHetan Majatalo” who is the fourth generation of this hotel and her family started the accommodation business since 1924 in Hetta. We talked with her to get a preliminary understanding of local people's views on tourism and local culture. We conducted wild explorations and visited local handicraft shops, supermarkets, restaurants and hotels. During our first field trip, we learned about the local environment through hiking, local handicrafts by visiting second-hand stores, and local history through local museums, exhibitions, and the church.

Hetta is a remote 800 people village in the Enontekiö province (1.5k people). In spite of the existing tourist infrastructure (three hotels, Lapland nature center, museum, cross-country skiing paths, downhill skiing center, and disk golf field), the tourism in Hetta is still only nascent. Because of its remoteness, the place has a distinctly homely feel to it and what tourism services exist exalt charmingly authentic amateurism. Enontekiö as a region has the advantage of being a transit place for many tourists going to Norwegian Finnmark and Tromsø both from Finland and Sweden. Hetta is also an

ideal roadside stop for Swedish Sami wanting to participate in Sami festivals in Kautokeino (Norway).



Figure 16. Handicraft stores in Hetta

Hetta is a small village population-wise, yet it is one of the largest municipalities in Lapland. People and places are very spread apart. It is situated by the Ounasjärvi lake and surrounded by fells. The village stretches along with national road number 93 and regional road number 956. During the survey, we learned that it is not only small but also the long-standing touristic tradition isn't reflected in the number of tourists there. It is however probably thanks to this that the place retains its peacefulness and serenity, in a very close connection to the surrounding virgin nature.

Socially Hetta is a very peculiar place. The village is very meaningful for the whole municipality as it is the place where the only high school (1-5 graduates per year) of the surrounding area is located, as well as one of the two churches of the entire municipality, and one out of five primary schools in Enontekiö. There are very few tourists during the spring, summer, and autumn, and most of them are just spending a night there, on their way to Norway. The community is aging, and very spread apart, the majority of the workers live off tourism, and the 10% Sami live mostly off reindeer herding. As Hetta

does not have a distinct meeting place, the majority of social events happen in private houses.

Insights from field research

There are many handicraft shops and museums full of design in the local area. They have very rich cultural communication significance, but it is difficult for tourists to find these places. Finnish Lapland is more inclined to get along with the environment due to the remoteness of its geographical location, rather than participating in large-scale social networking. There are very few places for socializing, but there are still cultural exchange activities based on the nature of the community. The local handicrafts are exquisitely made, but the phenomenon of falling dust indicates that the purchase rate is low. The local life is very quiet, similar to Rovaniemi, but enjoy the environment more and don't want too many people to disturb them.

4.1.3 Analysis of Interviews in ARCTISEN Project

During the second field survey, we used our short stay in Hetta to conduct semi-structured interviews with locals, artists, and visiting tourists from all over Europe. The interview lasted for three days and there were four groups of participants, including local enterprises, personnel of municipality, tourists, artists. While we were preparing the questionnaire, we listed some open-ended questions. We take this approach to understand how they expect the cultural communication in tourism, how tourists are involved in the local events, how the relationship between tourist and local ecology. According to the interview data, we pick up a demand from participants. They mentioned “*hopefully the business here could be slightly bigger, but not to ruin the tranquility in Enontekiö, because this place is quiet.*” From this point, we believe they want to make their business slightly bigger while the sustainable ecology is guaranteed. In this case, find opportunities to the local tourism, meanwhile, sustainable ecology is guaranteed, became a considerable goal.



Figure 17. The Ice Sculpture Competition in Enontekiö, photo by author, 2020



Figure 18. Semi-structured interviews in Enontekiö, photo by ARCTISEN team, 2020

Day 1
Interviewer 1—Municipality

Start: Don't have one ice sculpture map for this year. The last year sometimes sometimes has. And they (ice sculptors) usually at same places. Ice sculpting and snow sculpting it depends on winter matter. So far for us here it's easy to get the ice, depending on what weather so it's fresh. And it's hard work, I think it's the most difficult part for the place.

What do you think is the reason that people come here to you?
 I think it's a optic nature in central fins on belong with tourists to come here and also abroad, maybe. The speciality in our area is the northern lights, this is the most suitable place.

How do you think about the numbers like would you like to keep it as a level as it is now or would you like to improve the tourism?
 Yeah, increase the numbers I think we have that much space here.
 Could increase it a little bit and especially to make it last through the year, now it's a positive in some short period around Christmas time.
 And also this a spring when there's this beautiful snow and some season in autumn as well, but then there's a gap.
 When the holders are closed, We can put develop it and increase it so that the season would last throughout the year so.

Are there any actions that you make?
 People who are living here and also to manage our municipality economies
 Yes, we first together and we tried to promote our area.
 In a way that people talk come here but of course it need to be cooperating with.
 Some small companies here, hotels or other they are very small there might be all only a couple who is running it, so when they have a Christmas season, of course they are looking for a break and to put their doors close and have a holiday.

So is there are many questions that we face.
 Then we need to see how these people and who are running. In our area is small. Hotels on the kind of companies and then there are these a change hope and change.
 Yeah, and the spirit among the companies and hotels is very good, they discuss and tell you if they don't have this service you need, and suggest one for you.

They wants to attend event if there have one, they never see ice sculptures here before.
 Very much interest for ski, come for ski.
 For ski race they come. winter holidays, really good for family.

how to get information about event?
 not so much information on website, maybe a calendar to tell us what's going on, they only heard from locals not website.
 Better have information gathering on one place, like a calendar. next year or two year? yes, tacoun-the destinations.
 Enontekiö is were interesting.
 locals are easy-going.

Involved to local culture?
 For tourists who didn't speak finish, it will be more difficult to get familiar with locals.
 Maybe might be problem, more difficult.

Interview 5—Germany couple
 travelling.
 First time come to lapland.
 Just arrive at today. Also travel to norway.
 2 weeks travel and 2 nights for Enontekiö

Why go here?
 nature, and they found a nice hotel. before, come, didn't know anything for culture event and usually don't research for destination, but depends on destination, they don't go to one place for a certain thing or event.
 Have interest to participate culture event
 They come here mainly because nice hotel, dont know about the ice sculpture, only notice one outside the tourist centre
 problem they don't know what events are happening even they are here.

how long are you staying?
 A week

Expectation?
 To see reindeer and big snow. We had little expectations. wanted to see the Northern Lights

interested in local culture?
 They don't know about the ice sculpture competition before they came

Difficult to find information?
 No, easy to google

Want to participate in local cultural events?
 Depends on event, don't interest in ice sculptures. And they wouldn't come here for that reason

How did you find out about the ice sculpture competition?
 through the Internet and Facebook

is there anything you wish tourists would be more respectful?
 They feel impoite. to communicate with locals via their cell phones. know more about local things. Like don't feed birds.

Interview 6
 Hotel Hietan Mäitala
 favorite event?
 Mariapöytä. is part of her whole life, important for her, always looking forward for it. Also the music festival party, there are traditional things and full filled her childhood.

More people to attend events?
 She don't think it should be bigger, not too many space for tourists especially Maria events always very full.

Figure 19. Transcribe and highlights of the interviewer's answers by author

To be comprehensive, the interview data were analyzed according to two classification methods. One is to classify the interview data in theme according to the content, one is to divide the different stakeholders into groups and make insights.

Insight from classified by content

According to the interviewee's answer, for example, "*The specialty in our area is the northern lights, this is the most suitable place*", "*Could increase it a little bit and especially make it last through the year*", "*Yes, we get together, and we tried to promote our area, But I don't know how it actually going to work.*", "*Tourism is an important part of the income and we need to keep with the other*", I found the following conclusion:

Local residents want to have cultural communications, but the venue is limited and there is no specific plan: The marketing of local cultural events is minimal. The company hopes to develop local tourism and provide tourists with high-quality services, but they do not have a plan. The locals hold two attitudes towards tourists, on the one hand, "*I want to keep the area quiet, and I don't want too many tourists.*" Locals like music festivals and Marianpäivät that they want to promote them but the space for tourists is limited. On the other hand, they are look forward to have more tourists to bringing vitality to the local area.

The interviewee stated, "*I think nature is in the middle of the whole thing*", and they may have some extra, like music event. "*The music festival has its history, so some people come for that.*", "*Those are different kinds of seasons to do different things*", "*To see reindeer and big snow. We had few expectations.*" "*I wanted to see the Northern Lights*".

From this, it is clearly to see that historical and fresh things are more attractive to tourists, and according to Wilson et al (2001), if an area has a single landscape, people

may quickly lose their enthusiasm, which means there need to have fresh blood infusion.

Interviewee said, "*not so much information on the website*", "*we do not really expect to get to know other artist*". "*I'm not sure where I saw the information, maybe Facebook or ins*". It can be seen that the artist came here out of interest and had very little expectation before coming and "*did not want to gain professional skills or reputation*." The artist hopes that local organizations can provide more information, such as restaurants, hotels, and ice sculpture activities.

This proves that the local cultural communication has great limitations. Even if an event like an ice sculpture festival is held, the information is still not well communicated to tourists. Artists who go to the Ice Sculpture Festival can hardly even tell where they saw the information and did not expect much.

Insights from classified by different stakeholders

Municipality: *Enontekiö tourism should stay true to itself..Any intervention or project should be lasting, as entrepreneurs have been frustrated with the short-lived nature of projects in the past.*“*The marketing of cultural activities is very limited. “want to develop our own tools, provide quality services.*

Insight from municipality: Companies want to develop their own tools, provide quality services. Better local influence and sustainable economic development. Hoteliers, locals and government officials are mostly agreed on the importance of tourism for the local economy and the resulting need for growth.

Tourists : "*Get better travel services*", "*get a clearer understanding of local characteristics*". "*Learn more about what they can experience and explore*".

Insight from tourist: Most tourists come for nature and very few of them come here just for cultural events. International tourists are interested in local culture but that is not why they come to Enontekiö and most of them do not know how to participate.

Locals: *"There is a gap in the tourism year that should be filled". "And those people who work in tourism, except hoteliers, try to avoid tourists in their life outside of work". "Not too many tourists in October, November, January, and May."*

Insight from locals : The locals are mostly willing to share their everyday life and cultural events with tourists. To maintaining the local ecology and culture, obtain more sources of income. The locals are mostly willing to share their everyday life and cultural events with tourists. Locals want tourists to respect everything they have and get to know about their life, not just come for northern light.

Artists: *Artists expect very little before they come. Most of them just make it for a hobby and don't want to gain professional skills or fame from it, but they don't mind having more audience. The artist wants more communication with other artists in this event and hopes that the organizer can explain more about situations, such as restaurant, location of residence, etc. Artists can't remember clearly where they get information about the ice sculpture event.*

Insight from artists: Convenient way of getting information. Get more attention from the public, and have a better creative experience. They need more channels to communicate.

4.1.4 Conclusion of Data from ARCTISEN Project

The research question is based on the premise of sustainability, and the results of the interview also showed an amazing need for sustainability. The interviews were summarize from three aspects: ecology, culture, and economy

For economy, through field research and summarizing the common interests among the relevant stakeholders, the following results can be summarized, the local people like their current living condition and hope to make the income reach a stable state while keeping the local environment unchanged. They expressed that they do not want the number of tourists to increase significantly. In fact, they prefer to increase the tourism income rather than the number of tourists. Residents have repeatedly mentioned that there are few tourists in some months, and the hotel managers will even push away large tourist groups. They have clearly shown that they do not need a large amount of economic income, but hope to maintain the original locality status. This is very similar to the economic stability learned in the literature review. Any project development should maintain a stable source of income for local residents (Wallace and Russell, 2004). Although the epidemic did not occur at the time of the survey, it has been answered in the interview. It can be concluded that the local residents' demand for economic stability. Then income stability will be taken into consideration as a design opportunity.

Regarding ecology, in fact, almost every interviewer expressed their love for the nature, and unanimously agreed that “*Enontekiö tourism should stay true to itself*” on the basis of maintaining the status of the environment also confirms what is mentioned in Chapter 2.1. The sustainable development of the environment is a mechanism that cannot be separated from the environment (Elliott, 1999)

Then the culture, first of all, residents mentioned that they want tourists to “*respect everything here, not just for the Northern Lights.*” They expressed in the interview that they hope to have “more communication” with tourists, and tourists also want to learn more but have no channels. Through observation, I found that the relationship between tourists and residents is very delicate. In fact, both sides are eager to communicate, but both behave like outsiders in front of each other. And this is a design opportunity worthy of attention. In the literature review, it can be found that the research emphasized this problem long ago. According to Clements et al. (1993), the

development of tourism in an area is inseparable from the coordination of local residents and tourists. But today it is still a solution.

In addition, when interviewing Municipality, an important point has been mentioned, the development cycle of " new projects is very short ". This is actually related to what residents call "*gap month*", this shows the seasonality of the local tourism industry and the unsustainability of the project. Another important point is their suspicion of the project planner. Perhaps this is not only because of the short cycle they mentioned in the interview, but each project started for a certain purpose, and the project team would hope to get some value from them, rather than really consider this place. Although this is not from the interview content but from observation, the "*we want to develop our own tools, to provide quality services.*" mentioned by Municipality has been able to prove that they need autonomy, independence and controllability.

4.2 Results of Interviews with Potential Tourists

To conduct an in-depth study on the sub-question "Regarding the Finnish Lapland region, especially Rovaniemi, what are the needs and challenges of cultural communication in tourism?" In addition to interviews with tourists (Chapter 4.1), foreign tourists who have not been to Lapland were also interviewed.

In the process of organizing the interview content and materials, the interviewees were numbered, and at the same time for the writing of the thesis and the understanding of the interviewee's narrative, on the basis of verbatim transcription, the interviewer's oral narration was "standardized" text Transformation processing, that is, the verbal and non-substantial repetitive sentences in the interview narrative are deleted, and the pain points and needs are screened out by content analysis according to the purpose of the interview as follows:

Pain points analysis

Cultural communication mainly relies on third-party propaganda, with little knowledge of domestic information.

They can only see the publicity of a third-party travel company, worrying about the difference between the actual service and publicity.

It is difficult to know the local culture in advance. Due to the firewall, ins, Facebook are hardly to use for China, which reduces the chance of contacting the tourist destination.

Language restriction.

Time constraints, it's inconvenient to spend time looking for tourist information.

Needs analysis

Easily find the local travel website of the travel destination, rather than through a third party, and it will be better without worry about language barriers.

An interesting culture, with the value and meaning of deep memory.

It is better not to need potential users to spend time for searching, but to appear in the potential users' lives in some way.

Other findings

The knowledge of Rovaniemi is very limited, 60% of the participants do not know Finnish Lapland at all, that is 8 out of 12 people.

They often learn about a place through other people's travel photos.

Can not remember the impressive cultural communication for a while

Results of Online Research

According to the survey of European and American travellers by Google and TNS Market Research Company: 85% of consumers have smartphones, and 66% use

smartphones to surf the Internet as often as they use computers. ·89% of consumers research tourism products on the Internet and 56% mobile research devices. ·80% of consumers book travel products online, but only 9% use smartphones to book travel products.

Besides, search engines (71%), price comparison websites (62%), travel supplier websites or Apps (48%), and online audio and video (39%) are the most powerful ways for consumers to conduct more travel research.

In the use of Apps: ·25% of consumers prefer to search on their mobile device browser instead of downloading new Apps. ·Another 20% of consumers do not use downloaded Apps but prefer to search on the browser of their mobile device. ·Only 14% would like to use Apps instead of searching on the browser of a mobile device. ·39% of consumers will re-use apps that they have previously reserved. ·Only 10% of consumers will use apps that have not been booked. ·In the smartphone research journey, 24% of consumers will download new Apps.

Network information technology brings speed and convenience, and the tourism industry is also developing more vigorously because of the integration of the Internet. Every day, people search for travel information on the Internet. According to Google in Europe in 2013, 88% of Europeans will check information online before travelling, and travel-related searches in Europe are growing at an annual rate of 50% before 2020. Every 0.04 seconds, people search for travel-related information on Google; also, the number of travel information searches on mobile phones has an annual growth rate of 160%. Therefore, online travel service design optimization can be used as an important means to attract this part of tourists who tend to learn about travel information online.

Some of the above data can be used as a preliminary reference for the design of tourism services. Nevertheless, the tourism industry covers six major items: food, housing, transportation, travel, shopping, and entertainment, each of which still has consumer

needs and pain points. Naturally, online travel service design is often discussed by people in the industry about its feasibility. For example, how many people are using the itinerary planning platform? Does it meet the needs of users? However, the focus of travel service design is on the ease and smoothness of the platform and whether it can assist the various needs of potential tourists in the travel industry, such as traffic route information, navigation, real-time information push and reminder functions products. Except focusing on product and service innovation and organization streamlining, tourism startups should also be committed to value innovation. There must be a set of business models behind their operations to convey the core values of travel destinations effectively.

4.3 ThinkARTank Project

In this section, I will introduce the ThinkARTank project. Firstly, I will introduce the aim of this project and analyze the value of ThinkARTank project for this study. Secondly, I will describe the data from this project, and conduct data analysis. Finally, I will summarize insights from the project through data analysis and participants' feedback.

4.3.1 Aim of ThinkARTank Project

ThinkARTank is a workshop jointly organized by the faculty and students team of the University of Lapland and AMASS. The aim of the workshop is to generate a roadmap for the main stakeholders working in the governance field of Rovaniemi City (e.g. Rovaniemi City, Lapin Liito, etc.).

In this workshop, our team uses Art Based Research (ABR) and Art Based Method (ABM) to collect information from participants about their dreams, hopes and insights into the future of Rovaniemi. In order to make the data appropriate and meaningful, our team used the HINKU network, which is included in Finnish municipalities, and target

to mitigate climate change via experimental development. Our team use some of the HINKU objectives to guide the participants in terms of ecologically sustainable development, such as reducing climate emissions, promoting local well-being, to improve sustainable travel.

We conduct art based method to gain the knowledge and results of participants. The art-based approach helps us to deeply understand the participants' personal challenges, needs and visions, and then take action, which is very important for both our team and participants. In this way, we are able to participate together with the residents of Rovaniemi in public policy processes.

Due to COVID-19, we chose online meeting for our workshop, using team as the communication method, and choosing Miro to support the creative process required for the workshop. The main analysis data of this research are audio data, video data, observer transcripts, as well as the visual data and text data created by the participants on the miro platform.

4.3.2 Significance of ThinkARTank Workshop for This Study

In this part, I will focus on common interests. The concept of common interests leads us to practice the art and design based on the community rather than the user. It is helpful to explore the real needs of participants by collecting the most concerned areas data through open-ended questions. Then it comes to the third research issue. I will explore the impact of service design on users through art-based research methods, and observe the actual feelings of users brought by different designs in the survey. Finally, the results will be analyzed, and demonstrate the main findings and the next research direction.

The concept of the common good (e.g., Winschiers Theophilus, Chivuno-Kuria, Kapuire, Bidwell & Blake, 2010) require designer to consider community-centered

rather than user-centered art and design practices. In ThinkARTant workshop, we chooses open-ended questions to find the areas of development that stakeholders are most concerned about and uses an art-based format to dig deeper into the needs to explore more possibilities for Rovaniemi. In the workshop, we use a future perspective to guide stakeholders and avoid the limitations of design thinking. We think about the act of design together with the stakeholders, rather than just designing for them. At the end of the workshop, the feedback is collated and reflected upon, and analyzed to see how the data can be used to impact the current state of sustainability in Rovaniemi positively.

Bringing in as many relevant stakeholders as possible in the workshop helps to create a collaborative design, in addition to obtaining more information about needs and problems. The state of design today emphasizes designing with users and designing with stakeholders rather than just for them (Sanders, 2002, p. 20). The resulting data help researchers broaden their thinking and develop more effective solutions by understanding the skills and experiences of the different stakeholders involved.

With the advent of big data, analyzing and using data has become a major challenge, and any misuse can cause serious problems, such as Google's reported influence on voters' voting intentions (Epstein 2015). The problem may not have been intended or even foreseen by the designers, but misuse of the data has led to such serious problems. In *Designing for service*, authors Sangiorgi and Prendiville (2017) mention that service designers should have a developmental perspective and look at problems from a future perspective. This requires the service designer to be ahead of development and have a developmental perspective. In this regard, in our workshop, we also guided the participants by thinking about the future, and to some extent, were able to avoid the results being too biased towards the present or individual stakeholders.

It is important in service design to be human-centered, no longer the user-centered design principles of 2010 that focus only on the user's experience, but in fact, most of

the design will focus more on the interests of the main stakeholders. The app in today's cell phones will push based on the user's preferences, often with potential impact on the user. Whether such a powerful service system is providing a service or subconsciously helping users to make choices is a serious ethical question. (Prendiville & Sangiorgi, 2017, p. 235) A single-minded design based on user preferences can also lead to some degree of extremes, but at this stage, introducing as many stakeholders as possible can be beneficial to circumvent this phenomenon. For example, the rationale illustrated by hunger marketing in economics, when faced with long queues at milk tea stores, the first choice is not to add more stalls, but to sacrifice part of the user experience so as to achieve a kind of balance between the merchant and the purchaser. Considering all the relevant interests and involving more relevant stakeholders in the design activities can promote this balance.

The literature search and the output of the ARCTISEN project clearly show the importance of ecological, economic, and cultural sustainability. In order to achieve ecologically, economically, and culturally sustainable service design outputs, the first step is to balance the needs of all stakeholders. Therefore, as many stakeholders as possible were invited to participate in the workshop. Innovative methods, such as online research and the use of art-based methods, were used to motivate participants and reveal unknown needs more than traditional methods (Hanington, 2003), which also helps to explore the impact of art on users, so the research data from this workshop is of great meaningful.

4.3.5 Results of ThinkARTank Workshop

In the process of data analysis, the analysis method I use is content analysis in qualitative analysis, which is defined as a way to reduce the data and understand it. (Julien, 2008) In the analysis process, the participants' data was classified through thematic analysis, and the Venn diagram was used to implement the correlation methods, thereby I generate the insights.

Analysis of data from participants

Firstly, by collating the needs map, values map, postcard, and tree, I obtained 219 valid insights from the participants, and based on all the data, I derived 44 personal insights and sorted these insights, analyzing these clustering patterns can help the researcher understand the themes and facilitate concept generation (Kumar, 2013, p.351) as shown below, I divided the insights into five themes: environment, culture and communication, lifestyle, development and innovation, and others. The five themes were ranked in order of frequency of mention by participants, from highest to lowest, as follows:

Environment:

All participants used icons about greenery, and they take the environment very seriously
Locals have deep empathy, are part of the European community and environment, and focus on the coexistence of nature and human life

Locals desire green energy

Locals want to protect local animals

Ecological sustainability is the main demand

Innovative ways to make natural resources sustainable

Participants have a high level of satisfaction with the environment and want to maintain it in its current state and reduce environmental damage

The pre-task images are almost always related to the environment and are mostly daytime and sunny

Ability to maintain the environment in a wild state

Culture and Communication:

Locals love their food culture and want to maintain and pass it on

Want to spread local culture through innovative ways such as high technology, art, or cuisine

Want to introduce reasonable cultural inheritance and perpetuity rights

Locals are culturally sensitive and want to have policies in place regarding culture

Locals are more concerned about safety and language barriers and want to achieve real communication

Locals are very inclusive and are willing to meet people from different professions and cultures, as well as foreign cultures, such as Korean food

Locals want the local culture to be spread in creative ways such as art or food

Locals have an open and tolerant mindset towards culture

Locals want their cultural history to be valued

Lifestyle:

Participants generally expressed concern about safety due to the epidemic, and health and safety became a consideration for them

Desire to build localized and globalized ecological communities

The desire for a more convenient and rapid mode of transportation that is ecologically sustainable

Locals care about community relations and community culture and want to understand each other and relate to others in the community

Locals want to create eco-communities that build balanced and harmonious relationships between people and places

Original, handmade items are popular

Locals value and enjoy time off and the local lifestyle

Locals enjoy their home environment and need a sense of belonging

Expatriates want fresh activities to be introduced

Better infrastructure such as health care and schools, and better schooling in all aspects

Healthy activities such as hiking, fishing, etc. can be maintained along with the development

Development and Innovation:

Three people mentioned VR, AR, and other emerging technologies, and there is a demand and expectation for innovation from both locals and foreigners

There is a high acceptance of new technologies and a favorable attitude towards virtual

and distant contact, such as virtual fishing

Hope that tourism will be better and bring economic benefit

Need for a clear strategy and perfect implementation of it

Get the consent of the residents before implementing a plan, be more democratic and transparent

Coexistence of nature and architecture

Need for safe innovation and planning

Increase social innovation

Local and foreigners are interested in the creation of new technologies, new energy sources, flying objects, etc.

Others:

Immigration incentives, better immigration policies, more diverse population

Locals are very empathetic and want a balance between the wisdom of the elderly and the innovation of the young

Both locals and foreigners have a need for health

A desire for ways to help individuals improve their lives

Locals care a lot about wise older people and have a high demand for experience and wisdom

To better understand the needs of the participants and find common interests, I have venn diagrammed the above five themes. According to Kumar (2013, p.393), venn diagramming is an effective way to analyze the ensemble between two or more entities. The following is shown as follows:

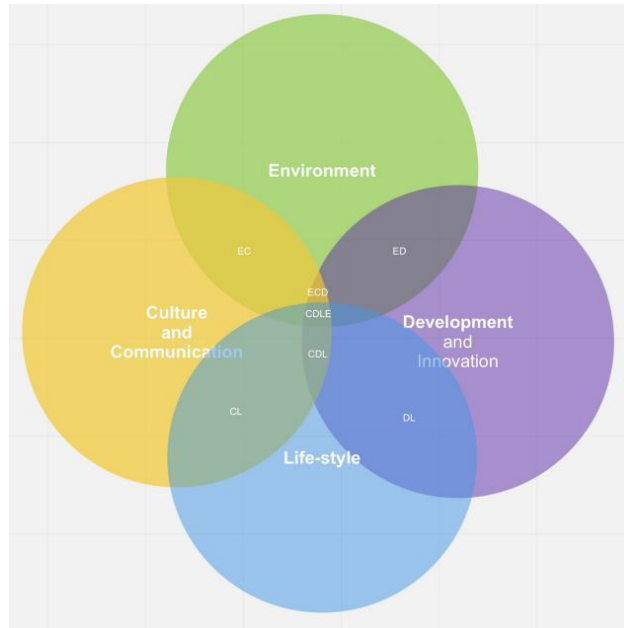


Figure 20. Venn diagram for analysis

Based on the overlapping parts, I generated new insights:

Maintain the positive part of the environment and life to achieve sustainability in an innovative and environmentally friendly way.

Focus on the role of community to improve the way people communicate with each other through innovative socialization.

Innovative ways to bring environmental sustainability into the community and into the lives of residents as a way of cultural transmission and a topic of communication.

Forming cultural exchange in innovative ways such as art and developing innovative technologies to form protection of the environment and promote eco-sustainability

Balancing tradition and innovation, forming a mutual promotion between the experience of the elderly and the potential of the young, and exchanging and colliding with foreign cultures while preserving traditional ones.

Analysis of observation and feedback from participants

By taking notes and watching the videos recorded in the workshop, I found that the participants' introduction to the pre-task images was brief at the beginning, and the

words were generalized and there were pauses. However, after the derivative work of the images, it was quite obvious that the participants were more excited, the answers were more fluent and the length of the language was significantly increased. In the process of map making and tree generating, every participant actively participated. This detail can be related to the previous literature review. Sensory experience can make people more emotionally fluctuating (Chou, 2019). In addition to explaining this complex problem, the potential of visual art can also inspire people to be more lasting and deeper. memory. (Jónsdóttir, 2017), which is further validates the value of sensory experience in communication.

From psychological perspective, the blank of post-it notes increased the desire of participants to fill it. In fact, it is true that almost every blank of post-it notes was filled in by participants, and in the subsequent feedback, some participants also mentioned the drawing of these maps as "*free my thinking*", This is a detail of design which worth further exploration. Through literature review, it is found that five-sense design is a design method that satisfies customer experience through design details and improving the surrounding environment (Godovykh & Tasci, 2020). By creating an atmosphere and paying attention to the psychological details, it will effectively improve the depth of the experience, which is conducive to achieving the depth and persistence of communication.

After the workshop, our mentor Melanie worked out a Google feedback web page, which enables participants to give feedback to the workshop from both positive and negative perspectives. the Feedback proved the effectiveness of introducing art into research, and also provided improving direction for this research. From the feedback of participants of the workshop, participants believed that the novel way "*refresh the tired brain*" can even help participants find "*a good strategy tool that could use in my own work*", and they agreed that visualizing ideas can enhance the depth of exploration. "*Visualizing one's own thoughts helped 'see farther and farther'*". Some participants suggested that sending postcards and planting trees to the future made people feel like

living in the future. Some also said that "*the vision of the future build with the help of symbols on top of my own image was an interesting way of working.*"

This shows that adding artistic hints into the workshop has a positive effect. And in the designing process, let the participants join their own efforts and design, can help represent their own ideas. It can effectively have a profound impact on people's psychology, and even some participants expressed in the feedback, that their thoughts even shocked themselves, "probably because I remember that my own thoughts were visualized and consolidated". In fact, the feedback of the workshop were collected one week after the end of the workshop, which further proves the long-term effects of these impacts to some extent.

In addition, some participants expressed in the feedback that "*pre-task is arranged in a unified form and runs through most of the process of the workshop*", which indicates that more attention should be paid to humanization and flexibility in the future design.

4.3.6 Summary of the ThinkARTank Project

The data and feedback from the workshop suggested that an art-based approach to research is effective, it increases understanding and empathy to a certain extent. Through participants' feedback, it is obvious that the visual expression makes the participants more excited, and there has a connection with the literature review. The experience gained through the five senses is direct and far-reaching (Fan & Xie, 2017) The participant can remember their thoughts even after a week . It is mentioned in the literature that when users spend time and energy to do something, their memory of it will be more lasting (Kim, 2013). It also helps participants express their ideas more clearly. Furthermore, the research data show that allowing the participants to spend time to join their own efforts in the process of design and production can not only deepen the thinking of the participants, but also make the positive impact longer on their self-awareness, which is of great value for subsequent researches. In addition, the

workshop data answers question 2. From the data provided by the participants, it is clear that the environment has an unsurpassed position in their hearts and that both local residents and foreign tourists enjoy the current state of Rovaniemi's environment and want to innovate and develop in a way that ensures environmental sustainability. Health and safety considerations of participants have increased due to the epidemic. In addition, Rovaniemi local residents are very inclusive, have a strong sense of community, are interested in both emerging technologies and long-distance virtual communication, and wish to promote cultural exchange and communication in innovative ways, forming a true sense of communication without language barriers, based on inheriting the original culture, for example, in the form of art and in the form of gastronomy.

Chapter 5. Design Solution

This chapter will introduce the design solution and design process. As the research phase 3, this phase takes design ethnography as a strategy, combines the research results of the previous two phases, and tries to answer the research questions through design practice. First, I summarized the preliminary design orientation from the research findings, then I conducted the ideation session and role-play ideation with relevant stakeholders, after which I refined the design criteria to generate specific design criteria. Finally, I will present the final outcome and show the test results.

5.1 Design motivation and positioning

From satisfying the basic viewing needs of tourists to promoting cultural communication, the upgrading of tourism is accelerating with the improvement of the social material living standards. Tourists' demand for cultural connotation and cultural experience of scenic spots is constantly increasing (Romão, 2013). As a result, characteristic cultural and creative products with complete design sense, unique characteristics, and carrying the cultural connotation of Lapland occupy an increasingly important position in the hearts of tourists. Excellent tourism related design has the spiritual culture contained in it, which can bring people's life convenience and cultural identity and belonging. Therefore, a good design in tourist destinations has gradually become an essential carrier for scenic marketing and promotion of local cultural communication (Hsiao & Chuang, 2016).

After comprehensive litigation of relevant literature and analysis of research results, including interviews and workshops, the design direction are summarized. The phase 2 of the research proved the value of sensory design in extending the user experience, and this stage requires sensory design to be applied to products for further verification. According to the research data, the design needs to ensure the sustainable development of Rovaniemi's local ecological environment and economy. Based on the expectations

of the interviewees, this study found that most residents want to increase tourism income while protecting the local environment. According to the research results of fundamental value, the design standard of the product or service also needs to have an excellent cultural communication function and help the local tourism industry gain the attention of foreign tourists during the lockdown period caused by the COVID-19 epidemic. A product design that balances the three functions of ensuring the sustainable development of the ecological environment and economy, having good cultural communication function will be conducive to the healthy development of local tourism.

In summary, the design position is set to be able to respond to emergencies such as COVID-19, and promote the sustainable development of local economic, cultural and ecology through online cultural communication. The target users are potential tourists of non-Finnish nationality. After the design is generated, the design output will be tested to explore the third question, the role of design in promoting cultural communication.

5.2 Stakeholder involvement in prototyping

According to Sanders (2002), the current design attitude has changed from designing for users to designing with users. Users are no longer passively involved in design research but are actively involved in the design process as designers and developers. And according to Stickorn's (2018, p.26) revision of the 2010 service design principles, "user-center" has been modified to "human-center", which means "Consider the experience of all the people affected by the service." so even if the participants in the co-design do not include all the people affected by the service in this study, I will still carried out with the human-centered principle, taking into account the needs of other stakeholders in the research.

So far it is possible to identify the stakeholders: potential users (people from countries other than Finland, who may or may not have any plans to travel to Finnish Lapland, or even do not know about Rovaniemi), Rovaniemi Tourism Board, Rovaniemi residents,

travel companies, online shopping platforms, travel-related services Rovaniemi Tourism Board, Rovaniemi residents, tourism companies, online shopping platforms, agencies providing tourism-related services.

In this study, I invited three stakeholders to work with me on the design process. One of them is the owner of Taobao store among the stakeholders and has been operating an online store for 2 years. The other is a tourist among the stakeholders, or as a potential user. He is a senior tourist but not been to Rovaniemi yet. The third participants is a university student majoring in sales, he comes from China and has lived in Rovaniemi for eight years. The idea was carried out using the method in Chapter 3.5, and the design criteria were generated after the idea was sorted.

5.3 Design Criteria

Based on the analysis results obtained from the research and the results obtained from the collaborative design with relevant stakeholders, I have formulated corresponding design standards for this series of tourism product outcomes, and summarized the core values and meanings of each standard. This standard determines the priority of design and decision-making in an attempt to obtain the most reliable results. There are five aspects in the standard, as follows:

1. Visual product design that meet key values criteria

Through the dissemination of tourism innovative product design, Rovaniemi's intangible cultural heritage can be genuinely integrated into modern people's daily lives in material form, which will play an essential role in the protection and dissemination of Lapland culture. Visually, this study uses a three-fold DIY instruction manual design and an illustrated postcard with a picture of Santa Claus and a reduction in the living space of polar bears caused by global warming (Screen information: Polar bears' habitat room has shrunk as a result of global warming, and Lapland is the birthplace of Santa

Claus, who is renowned for the northern lights.). Such cultural and creative products can give users an immersive experience through sensory design, making it easier for users to have emotions about this item and region. At the same time, it can promote the "high-frequency consumption" of scenic spots to promote the development of the local tourism economy(Min, 2008).

2. Taste product design-food packaging design that meets respondents' expectations

Lapland culture is developed with Santa Claus as the core, and tourism and culturally innovative products with Lapland cultural value are an indispensable coup scenic spot to attract tourists and form hot topics among tourists. The development of cultural and creative products in scenic spots has been slow. According to statistics, many scenic spots in Northern Europe account for less than 10% of the income from tourism cultural and related products. Making efforts in tourism cultural and creative products, enhancing tourists' secondary consumption in scenic spots, and providing new ideas for the transformation of scenic economic income has become an important issue facing cultural scenic spots. Therefore, this research will start with taste and design food packaging design related to Lapland culture. Through the development of cultural and creative tourism products with Lapland cultural brands. For example, Chocolate. Chocolate with Lapland cultural packaging will significantly help promote, publicity, and sales of tourism products of the region's distinctive brands. Simultaneously, these marketing deeds significantly help the product sales and the origin of the product-Rovaniemi. It is expected to attracting more and more tourists admiring the name of the Chocolate and finally promoting the development of Rovaniemi's tourism industry through the cultural tourism products sold far away.

3. Focus on the user, attract tourists from the auditory design

By making DIY videos of clocks, they are centering on the experience of tourists, embedding a sense of self-direction, and making tourists become active experiencers in the process of exploring DIY clocks. Excellent travel products or interaction designs are transparent, allowing users to forget their existence when using them. Human attention is limited. Therefore, the more elements in the design of tourism products, the stronger the dispersal of the user's energy. In order to make users immersed in it, the DIY video design for making clocks tried in this research follows the following points: reduce the number of elements, reduce the visibility of irrelevant elements (including color matching, size, transparency), hide elements, and reduce the difficulty of interactive operations. The design of simply making a clock video can give the user an immersive experience, but more importantly, the user has spent time and energy in the DIY process, so it is easier to have an emotional connection between this item and the region of output(Kim, 2013).

4. App design principles that meet key values and meanings

Through the addition of cultural creativity, tourism products have formed viral marketing cases. The most powerful channel for communication at the moment is word-of-mouth communication on the Internet. Young people constitute the main force of word-of-mouth communication on the Internet, and the design of tourism products perfectly fits the communication pain points of the young people. Therefore, excellent tourism service and product design can increase product sales in Rovaniemi and form a wave of topics among young people. Rovaniemi, who represents Lapland culture among tourists, seems to have won. The new birth also allows culture to influence the new generation of people in a renewed way (Beirman,2020). The Rovaniemi Travel Guide app was born to make it easier for young people to obtain local travel information more quickly and allow the culture of Lapland to be more extensive through the Internet when COVID-19 hits the world. Spread and attract tourists to travel to the local area in the

future. In addition, the APP also has the function of arousing users' sense of responsibility in protecting the environment. Users can read and understand the local culture and environment through the APP's travel information (William,2020). Through the energy-saving mini-games in the APP, users will be rewarded if they complete the task and therefore begin to pay attention to the impact of energy consumption on the ecological environment.

5. An immersive experience, interact with users.

In the clock design, firstly, this research obtaining the critical point that time is the main requirement of the user to use the product. Therefore, considering how to allow the user to obtain an immersive experience is the primary design goal of the clock made of stone plastic clay. From a visual perspective, we can see that any other unnecessary information on the clock, such as the system time, is hidden. The most prominent is the content of the glacier image. Other functions, such as ideas and page numbers, which may be used but not frequently, are designed to be very small, and the grayscale design is also low. Secondly, it is imperative. From the point of view of interaction, this clock has only one operation on the use; that is, the user observes the direction of the pointer by themselves. The user's observation time is the most natural way of interacting with the user in the clock's design. The user is very natural when using it, and it is effortless to use, does not need to think, and does not distract users (Issaoui,2015). This study believes that this is called "not disturbing" so that users can focus most of their energy on observing the contents of the "fading glacier" clock, which is called an immersive experience. Finally, the design of the clock also raised suspense. Why does the glacier shine? The answer is in the postcards of the same series. Users can get the answer by purchasing this series of products and interact with the overall design.

Principles and requirements for material selection in product design

In the design of tourism goods, material plays a crucial role. Designers must understand

the properties and roles of the products used in the product in order to choose the best materials. In terms of material selection, this study took into account the product's functional, technological, economic, and environmental requirements (Han&Xia,2015).

Product functional requirements

The ability of a substance to satisfy product purpose and use conditions is directly linked to the product's consistency, as well as its performance. It is primarily expressed in the limitations on materials according to product function, scale, durability, and consistency (He,2011). To meet the functional requirements of the product, for example, the outer packaging of chocolate and the material of clocks are made of recyclable materials, such as resin and clay, to minimize the damage of the product to the environment.

Process requirements

This is mostly due to content constraints imposed by commodity technologies. The product's content was treated to produce the desired result during the design process. Mechanical grinding, heat treatment, surface treatment, and other facets of the material requirements are also part of the product technology.

Economic requirements

This is mainly reflected in the material price, processing cost, material utilization rate, and other factors that affect the production cost. This research pursues the economic attributes of maximizing profits, reducing production costs as much as possible, improving product competitiveness, and enhancing product sales and profit margins. This research uses many cheap materials to replace the relatively expensive rare materials, such as the use of materials that are not easily damaged in some wear-resistant parts, and the design of the outer packaging of the product uses reusable materials.

Environmental requirements

This research fully considers its environmental protection requirements in product design and chooses as many as possible non-polluting, high utilization, and recyclable materials to promote the sustainable use of products and show environmental friendliness (Tian and others,2019).

This design product also needs relevant digital technical support and logistics distribution channels. These two elements are related to the Internet cloud system, supporting and distributing materials and information about products to users.

Digital support and dissemination: These two elements are related to advanced digital technology support, used to distribute travel product information and provide an immersive travel experience to users and potential tourists via the Internet.

Product distribution: Provide Internet sales channels; users can download materials and information from related websites to ensure easy understanding and use of products.

Digital support: Internet cloud channels such as apps and websites that provide Lapland culture are used to collect user feedback and share their interest in Lapland's tourist attractions and allowed the users to share cultural knowledge with other users through the designed APP.

This research starts with the design output, fundamental values and meanings, and the interviewees' expectations as the final product design criteria. It is also a key finding related to previous literature review and analysis of research results. This research conducted careful discussions with relevant industry practitioners and stakeholders in the workshop and research process and made final recommendations. This list also combines the critical points of product design and some design principles analyzed in the previous chapters. In the design concept and product development process, this research strictly refers to these three standards to make all design decisions. The final

output of the design needs to be consistent with the research results, that is, to ensure the sustainable development of the ecological environment and economy, meet the needs of local people and realize the value of the product, promote the output of Lapland culture and attract more tourists. Finally, this study will also be used as an evaluation template in the discussion in subsequent chapters.

5.4 Design Outcome

The final outcome is a series of travel products (Figure_21). The idea of the final output is to open official online stores on shopping platforms in other countries, and include the QR code of travel website information in the products sold, increase the economic income of Finnish Lapland by obtaining certain revenue, attract potential tourists to travel, and achieve the purpose of cultural communication through the environmental education function of the series of products, so as to promote the goal of sustainable economic and cultural-ecological development of Finnish Lapland to a certain extent.



Figure 21. Design outcome by author, 2021

Although this output exists as part of the research, it can still meet the findings of the previous research. For example, municipality hopes to have independent tools instead of relying on a project. Therefore, the establishment of official online stores in other countries will be an option. It can meet the needs of relevant stakeholders for independence and control. In fact, it also provides the possibility of economic stability to a certain extent. For example, online shopping during the epidemic has appeared an unprecedented grand occasion (Li, 2021). At the same time, it is suitable for satisfying tourists' expectations of obtaining first-hand information, rather than conveying it through a third party.

The set includes a set of postcards, a fabric bag, a plate of chocolates, aromatherapy, and a clock that needs to be made by the user. The cost is estimated to be 92 RMB / 11.8 Euros, and the estimated price is 229 RMB / 29.9 Euros.

Scenario

This is a set of travel souvenirs sold online, which will be sold through Amazon Taobao and other online stores. In fact, it is not a souvenir of travel in the traditional sense, but rather the user experience products before the travel planning. Each product in this set has a different meaning, but the purpose is to allow users to experience Lapland's tourism services before they even arrive there. At the same time, it allows potential users who have no desire to travel or do not know Rovaniemi to get a first impression of Lapland as a region and to think and plan a trip there. Finally, through this series of products, the cultural communication of Finnish Lapland is completed in the form of art, and the users are educated about the environment in a subtle way. Below is the scenario of the series of products (Figure_22).



1. The user saw the product on online store and places an order to buy it.

2. The courier delivers the goods to user's home.

3. The user opens the voice card and receives a customized Santa greeting.



4. She reads the DIY guide while eating chocolate and turns on aromatherapy.

5. She scanned the QR code on the DIY guide and read more Lapland's information.

6. She begins to make the DIY wall clock. (*Flowing Glisten*)



7. She hangs the clock on the wall and goes out with the cloth bag.

8. She talked to her friend about Lapland and hopes to go together next Christmas.

9. They arrive in Rovaniemi and send postcards from Santa's village.

Figure 22. Scenario by author, 2021

System map

Stakeholders include Logistics company, Factories, Users (Non-finnish potential tourists), local Designers, Finnish Lapland (online store in the promotion area), Tourism Information Platform, Local Residents, Related Regional Governments, Regional Tourism-related Industries. Among them, Santa Claus Village is included in the logistics company, which includes Santa Claus who may provide voice blessing services (Figure_23).

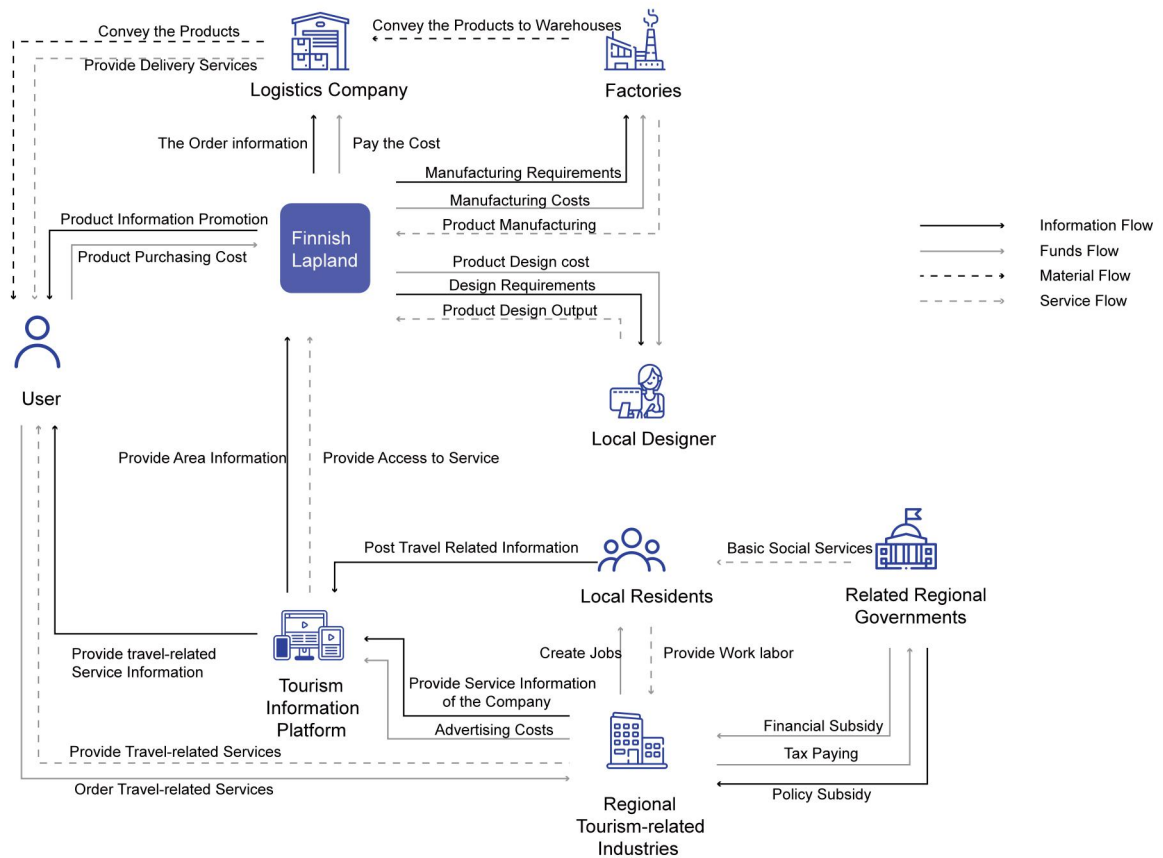


Figure 23. System map by author, 2021

I will introduce each product of this series design. First is this set of postcards, which is a series of postcards in the form of a set of illustrations. In this set of pictures, I hope to convey to users that Lapland is the home of Santa Claus, and polar bears live on earth together with humans, and they also lead their own lives and happy holidays. In the romance of Finland, polar bears may also live Christmas as we do, while their living

environment is becoming less and less because of global warming, which is a thing worthy of everyone's attention.

The postcard illustrations are shown below (Figure_24). In the first illustration, the polar bear is sitting on a glacier, and a seagull helps to shade the polar bear from the sun. In the second illustration, Santa Claus wishes the polar bear a Merry Christmas and presents the bear with a Christmas hat. In the third picture, a characteristic Northern Lights of Lapland was appeared, which are very popular among tourists. From this picture, it is already obvious that the glacier underneath the polar bear is decreasing. Here, the user may notice a certain similarity between the triangular shape of the glacier and the triangular shape of the Christmas hat. In the fourth picture, the glacier has been seen, only a little ice and snow remain on the Christmas hat, and the polar bear sits on the hat, which at this time is like melting ice cream, shining under the sun.



Figure 24. Illustration for postcard by author, 2021

The second series of products is *Flowing Glisten* (Figure_25), a DIY product, with the instructions booklet and production video. The instruction booklet is shown below (Figure_26), and the production video requires scanning the QR code at the bottom of the last page of the instruction booklet. It would be better to scan the QR code to get the relevant webpage and APP, so that the user can get better information about Finnish Lapland and its culture. and induce the user to travel through the built-in mechanism of the APP, for example, the idea of going to Rovaniemi to cash in by completing the reward for environmental protection in the APP, which will further promote the potential.



Figure 25. “*Flowing Glisten*” design and made by author, 2021

About *Flowing Glisten*, the product is to make a household product by hand, which is of value to the user and can be used as a gift. Through hands-on experience to get a home product that can accompany the user's life, the reason for choosing a home product is also to be able to accompany the user for a long time and have a subtle influence on the user, as mentioned in 5.4 design criteria.

The following figure is the production and use instructions (Figure_26), which is presented in the form of a three-folded page. Its production steps are as follows:

1. First, take out our materials: a piece of clay, a round tray, some tin foil, a light strip, a clock movement and clock pointer. If you don't want to get your hands dirty, you may

also wear gloves.

2. Smear clay on the round tray and add water appropriately. Let's smear freely until the whole disk is covered. Don't worry about whether the surface is smooth, but pay attention to leaving the center of the circle so that clock hands can be installed later.

3. Let's take out the tin foil, and wrap the periphery of the circle with tin foil. You are free to wrap the circle, the height and size are up to you. (You also may use glue to fix the tin foil on the periphery of the circle to prevent the position of the tin foil from changing, but don't worry, there is no problem without glue, just use our clay to paste it.)

4. Smear the clay on the tin foil, you can freely control the thickness of the smear, which determines the ups and downs of the "glacier". But pay attention to leaving the square opening at the periphery of the circle, which is where the light strip is installed. Then let us wait for the stone plastic clay to dry naturally. The air-drying time is about 5-15 hours, depending on the thickness of our smear.

5. After air-drying, we can install clock and light strip. First, pass the clock pointer through the center of the circle, align it with the clock movement, and tighten the screws. Then pass the light strip through the square opening on the periphery of the round tray, tear off the back glue of the light strip, and stick the light strip on the outer wall of the round tray.

6. Finally, let's adjust the time of the clock and turn on the light. Then our "Flowing Glisten" is finished. Is it like a glistening glacier, but why is it flowing? The answer is in our postcard.

Welcome to scan the code for more information. You will find a video version of the production process here.

The third product in the series is a bar of chocolate named Polar Bear Gift (Figure_27). In fact, there should have been a moose gift, with the image of a moose on the chocolate packaging, but due to time constraints, only a polar bear packaging design was created as a concept presentation. Since Finnish chocolate is very famous and a travel souvenir with a high purchase rate among tourists, it was included in this series as a promotion of local specialties.

The fourth series of products are fragrance products. In the process of concept generation, I did not choose the relatively novel scent diffusing stones, the relatively inexpensive scent pills, but the relatively common scented candle named Secret of Northern Lights. Candles were chosen because they are considered to be emotive and have been found to act as a channel for emotional communication (Häkkinen et al., 2016, p. 332) Another point is that during the co-design process with the stakeholders, some participants mentioned that candles give a mystical feeling and can be used to make wishes, which is a good symbol. The northern lights, as an uncontrollable presence, are also mysterious and of special beauty. On a spiritual level, many participants said they make a wish when they see a shooting star, and they have the same idea about the Northern Lights. The use of scented candles at this time, in addition to using the scent to help users feel Rovaniemi, can also further simulate the wishing action that may be made when seeing the Northern Lights.

In terms of shape selection, the iceberg shape is used as a metaphor, and the iceberg will melt after the aroma is ignited. After the scented iceberg has completely melted, the user can wash the glass which containing the scented candle and use it as an ordinary glass. The glass is equipped with a lid, like the polar bear shape shown in the figure below (Figure_28). At the same time, a straw can be inserted between the polar bear's arms.



Figure 28. Aromatherapy candle “The Secret of Aurora” by author, 2021

The fifth product in the series is the cloth bag. In the choice of the overall packaging design, I chose to use the cloth bag as the overall outer packaging for this series of products. First of all, the cloth bag is environmentally friendly, very much in line with the Finnish concept of environmental protection, and as a product often used by Rovaniemi residents, it can effectively close the distance between potential users and the tourist destination of Rovaniemi. Secondly, it has certain practicality, and as a product that can be used for a long time, it can always remind users of its origin and generate the idea of going to Rovaniemi, subconsciously influencing potential users.



Figure 29. A cloth bag used to hold other products, by author, 2021

Since this series of products need to be sold online, it is necessary to select suitable

mainstream shopping sites according to different countries and regions, such as Amazon for European use, Taobao for China, etc. Due to my background and experience, the test was only conducted in mainland China by finding people willing to cooperate with the test in Xiaohongshu and WeChat platforms.

5.5 Result of Test for Design Outcome

The feedback of interview results are as follows:

interviewee said, *“There is no particularly good form of cultural exchange in the impression, but it is definitely not a travel advertisement, it is always deceptive”*; *“If I will gained special experience then I will buy it”*

During the journey, tourists satisfy their psychology by purchasing tourism products, in essence, this is the purchase and enjoyment of culture by tourists (Xu, 2010). The way of cultural communication will make a major change in the experience, and the selected media will directly affect the user experience.

interviewee said, *“The most important thing about travel is not how many different places you have visited, but to experience different ways of thinking and to understand the diverse cultures of the world”*; *“I have to know this place before I can consider whether to go or not”*; *“Before your asking, I didn't know anything about Lapland. But I might travel to Lapland in the future.”* Through these answers, conclusions could be found:

This kind of cultural product has a certain potential and can give users a basic understanding of a place, it provides a way for potential tourists to begin to get to know and understand Lapland through local cultural products. Du Cros & McKercher (2014) have shown that the products provided by tourist destinations can play a significant role in increasing the flow of tourists.

Ten of the 15 people did not know anything about Rovaniemi but expressed that they liked Finland and the Nordic design was very famous. One of them had been to Helsinki, Finland but did not go to Rovaniemi due to a tight schedule. In the consideration of the communication media, the price should also be selected, so question about the price also should be asked, and it has been found that 13% of people still think that the price is unreasonable, that is, 2 out of 15 people. The other 13 people thought the price was appropriate, and 7 people said it was a really favorable price.

5.6 Findings

The results of the evaluation found that the concept of this series of tourist souvenirs was generally well-received. Participants were able to develop an initial understanding of Lapland and were able to form some reflections on the current state of the environment today. The introduction of suspenseful questions was able to provoke thought, and eighty percent of users understood the meaning of the combination of glaciers and time and indicated that the blue light shape was a good fit. The results showed that the design of the prototype attracted the preference of most participants, with a specific figure of 13 out of 15 indicating that they were satisfied with the shape of the prototype design, but at the same time, more than one-third of them were concerned about their hands-on ability, with a specific figure of 7 out of 15, so how to dispel users' doubts will also be included in further consideration. In addition, despite the price and safety considerations in the choice of materials, still will not meet all participants, failing to take into account the existence of chocolate allergies, aromatherapy allergies, and other problems, and this series of products are at the same time, will inevitably affect the user to make a choice, in the subsequent adjustment should give the user more choice.

It is worth noting that the participants who experienced the product expressed their love for it. After the interview, they even sent messages such as "I regret the application was too even at the time." I also bought the Nordic style. "Wallpaper", they emphasize more

on the details of the production, which in fact proves that vision has the potential to bring long-term effects. In addition, it was surprisingly shown that the product itself, in addition to spreading its own value, may also trigger further consumption of similar products.

Chapter 6. Discussion

This chapter will present the validity and limitations of this study. I will discuss how these findings answer my objective and what was been found.

6.1 Validity of the Study

1. In an unprecedented situation like the COVID-19 pandemic, what design opportunities are suitable for cultural communication in tourism in Finnish Lapland?

Through research, the following design opportunities were found based on the assessment of the status of Lapland and the needs of stakeholders:

1. In terms of cultural communication in the tourism industry, the needs of tourists are often put in the first place. However, among the stakeholders involved in tourism, the crucial position of local residents is often ignored by the researchers when looking for design opportunities. It should be stressed that the achievement of sustainable development is inseparable from meeting the needs of local people and their expectations for the future. Therefore, in this study, more attention is paid to the needs of locals in Finnish Lapland, and the workshop also focuses on the local people's expectations for the future.

2. Through literature review, it is discovered that Finland's sustainable development education not only meets the needs of locals, but also contributes to the sustainable development of the environment. Integrating it into the tourism industry can be a valuable chance for the cultural communication of Lapland.

3. The data from the interviews before the outbreak of COVID-19 has helped to generate insights into the local residents' desire for economic stability. The research

data shows that the tourism industry in Finnish Lapland is characterized by seasonality, which is expected to be alleviated through online cultural communication. Literature and online research show that tourists from various countries use cell phones and do online shopping frequently, which indicates a lucrative market for online culture communication.

It could be a good starting point to spread the local culture of Lapland through online methods and expand its influence on the lives of people in other countries. The focus of this study is online cultural communication, but offline methods that can be beneficial to the cultural communication of Lapland are also paid attention to.

2. Regarding the Finnish Lapland region, especially Rovaniemi, what are the needs and challenges of cultural communication in tourism?

Through this study, it is clear that the stakeholders share a common love and concern for the environment. The literature review shows that sustainable development requires a balanced development of ecology, culture, and economy, which is further confirmed in the workshop and interview.

Regarding the economy, the results show that the relevant stakeholders in Finnish Lapland are expecting more stability rather than blind growth. In terms of culture, their needs are to make innovations while inheriting traditions. This is also reflected in their attitudes towards the environment, namely to maintain its original state when innovative designs appear. In fact, relevant stakeholders in Finnish Lapland hope to spread their own culture in the way they coexist with the natural environment and share this attitude with others countries.

The research on potential tourists who have never been to Finnish Lapland also shows that they hope to obtain first-hand information about the travel destination, rather than obtain information through third-party platforms as they currently do. It is worth noting

that the research has found that the needs of potential tourists are similar to those of foreigners who have lived in Finnish Lapland for a long time. They all desire to remove the language, geographical and other barriers to achieve real communication.

Then the challenge also comes from the following aspect: first, how to remove obstacles to achieve communication; second, how to maintain the current state of the natural environment in the background of global warming. Art, as a means of expression, can effectively reduce language and geographical barriers. To maintain the current state of the environment, changes need to be made through development, which means that cultural communication should include global value and appeal to every individual.

3. How can design play a role in cultural communication in tourism?

Through researching, understandings of this question are generated from two aspects. One is the practical application and the other is methodology.

In terms of practical application, the most direct role of design in the entire research is to raise and solve problems through design thinking. The existing problems in the tourism of Lapland can be addressed by combining design opportunities and specific needs.

This study mainly involves service design, sensory design, and product design. Service design focuses more on thinking, while sensory design pays more attention to users' emotions and experience. When designing products, more attention was paid to the actual value and economic benefits. This study, by using them in combination, carries out cultural communication and completes the process beginning from thought, to emotion, and then to reality.

Among them, the role of sensory design is more direct. Through workshops and product testing, the advantages of sensory design in communication can be found. Sensory design was applied in tourism products for cultural communication in this study, which

shows sensory design can make the impact of communication long-lasting. The test results show that users are more willing to accept communication methods that incorporate design. Sensory design enhances the user's experience of cultural communication and brings certain chances for the development of tourism. It is conducive to regulating tourists' behavior regarding the natural environment, and it can also create large economic benefit for Lapland during the pandemic when offline tourism face severe challenges.

The purpose of the current study is to design for sustainable development, it focuses not only on the means of communication, but also on the duration and value of the impact of cultural communication. In fact, there are many designs that pay attention to communication methods, but if these methods only cause temporary effects, it may be worthless to devote time and energy to such designs. In this study, design runs through the entire research process, trying to bring the research closer to reality and verify that the impact of communication is effective. The research results also show the potential of design in terms of long-term impact and practical significance.

In addition, though methodology can be useful in guiding the design process, it should be viewed dialectically. Design is human-centred, and the complexity of humans means that it is difficult to find a perfect method to conduct a comprehensive study on a certain group. Besides the practical problems during the design process, the future should also be taken into consideration. In addition to the current people-oriented thinking mode, the sustainable thinking mode should also take future generations into consideration.

6.2 Limitations

The limitations of this study mainly lie in two points, one is methodology, and the other lies in my own limitations. Design is human-centred, and the complexity of people determines that it is hardly to find the perfect methodology to thoroughly understand a group. In addition, design ethnography often carries hypotheses before the research

starts, which may cause the hypothesis lack of research, and lead to deviations in the results of design ethnography, even though traditional ethnography and literature review are used in this research, there may still have subjective judgments.

This study were conducted under the special circumstances of the COVID-19 pandemic. And this leads to most of the work being carried out online, which may affect the observation of user behavior and may affect the results to a certain extent. Meanwhile, there are also problems with language, Finnish was used in the research process, and English is the author's second language, which may lead to deviations in understanding. Due to time constraints, the scope of sampling and testing of research data is limited. Although relevant stakeholders have been added as participants, the limited sampling data and the number of participants will inevitably affect the reliability of the data results.

Chapter 7. Conclusion

7.1 Summary

Sustainability has never been an unfamiliar word. Most study concludes that sustainable development is of great importance to mankind. In recent years, new communication methods have been emerging vigorously to spread the idea of sustainability. However, one of the major concerns of this study is whether a certain communication method itself is sustainable, whether it can bring sustainable impacts, and how to apply such impacts to practice.

This study takes Finnish Lapland's tourism to conduct a practical experiment, investigating methods to enhance and prolong the impact of sustainability, trying to put this impact in real life to confirm its value. The purpose of this study is to design for sustainability through cultural communication, and the goal was reached after three phases of research.

First of all, the world is constantly changing, which requires designers to keep pace with it and grasp design opportunities based on the specific situation. During the outbreak of COVID-19, the online market has shown great advantages. Meanwhile, according to research findings, locals of Lapland wish to protect the natural environment while achieving economic stability. They hope that they can use their own tools to provide services instead of relying on someone else to design projects for them. As a design opportunity, online travel has the hope of meeting residents' needs for economic stability and independent development.

Secondly, communication is a two-way process, which requires the researcher to understand the needs of both parties, so ethnography is adopted as a strategy to conduct research on Lapland residents and potential tourists. What is for sure from the research

is that both parties are eager to achieve real communication, rather than relying on a third party as they currently do.

Thirdly, what this study concerns is how can design make sense for sustainability through tourism. The sensory design has been confirmed through workshop and feedback that it can make the impact more far-reaching, which is also consistent with the conclusion of the existing literature. Also, the natural environment of Lapland is highly relevant to the common interest of stakeholders, and it is the biggest concern of Lapland. The introduction of environmental education is expected to regulate the behavior of potential tourists. this study tries to fill the gap in the existing research through design practice, to demonstrate the feasibility of combining environment education and tourism for sustainable development.

In the design generation stage, sensory design products were selected and disseminated through online stores in order to respond to the needs of relevant stakeholders for independence in development and convenience in reaching potential tourists. During the epidemic, online shopping experienced rapid growth, which provided a possibility for economic stability. Moreover, the design products are expected to alleviate residents' concerns about travel seasonality. The design output was used at the third stage for research, and I combined the findings of this study with those of the existing literature in the design process. The feedback results also highlighted the potential for cultural communication to promote sustainability.

The research results show that sensory design can prolong the impact of sustainability, and the application of environmental education as a content of cultural communication in tourism can meet the needs of stakeholders while contributing to environmental sustainability. Online sales can cope with COVID-19 and has potential to alleviate residents' concerns about economic instability and attract more tourists. In summary, the research purpose is achieved.

This study covers a wide range of issues. It explores the practical value of sustainability by combining multiple fields and tries to make the sustainability impact long-lasting. Though there are limitations of this study such as the lack of targeted and in-depth research, it still provides a possibility for comprehensive exploration.

7.2 Further research

This study aims to present a possibility and not to give a solution, but this direction is worthy of further research. I have summarized three areas that could be further researched. The cultural communication of tourism can be more emotional which needs more experience-based design. It can start from multiple angles such as film and television to establish impressive spiritual leaders, and even establish a cartoon image that can be reminiscent of deep value. The continuous development of the image of educational significance will also be suitable for the physical and mental development of young people and children. Research in cooperation with Finnish advanced education is also a direction that can continue to be explored.

The second direction is keep exploring the ways that make the impact lasting. Sensory design can be used as an entry point, but more interdisciplinary fields need to be investigated. Because communication is only the beginning, the purpose is to produce actual impact and make the impact value and sustainable.

The third area is further research on online tourism service systems. Before the start of the epidemic, online tourism was rarely mentioned as a way to promote sustainable tourism development, and there is a lack of design for online tourism service systems. A more interactive approach to online services can be a valuable area to study. This interaction is no longer limited to a single interface or even unconventional interfaces. The online travel sector is an important direction for conducting promotions, and depending on the combination of culture, feasibility, and revenue. More different services, and products can be further researched.

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