



**FEASIBILITY OF VIRTUAL REALITY IN THE TOURISM INDUSTRY OF
NEPAL**

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ABSTRACT

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Feasibility of Virtual Reality in the tourism industry of Nepal

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The thesis is an investigative study that aims at analyzing the feasibility of Virtual Reality technology in the tourism industry of Nepal. The study identifies the current interest and readiness for the adoption of VR by domestic tourists and their opinion toward VR tourism. It also examines the business activities of VR related businesses in Europe to evaluate the trend and the potential risks of similar businesses in Nepal.

The study is mainly based on the qualitative method and the survey strategy is used to collect the primary data. The research is moreover exploratory by nature. The first survey indicates the presence of a large number of potential internal tourists for VR tourism. While the second survey illustrates that VR related businesses in Europe are growing and well established.

The positive results obtained from the surveys conducted to understand the business landscape lead to feasibility testing. The feasibility analysis reflects a positive outcome that signifies the likelihood of merging VR technology in the tourism industry of Nepal as a business concept.

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ABBREVIATIONS

AR	Augmented Reality
CAVE	Cave Automatic Virtual Environment
GDP	Gross Domestic Product
HMD	Head Mounted Display
INGO	International Non-Governmental Organization
MCTCA	Ministry of Culture Tourism and Civil Aviation
MOFA	Ministry of Foreign Affairs
MR	Mixed Reality
NGO	Non-Governmental Organization
RQ	Research Question
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNWTO	United Nations World Tourism Organization
VE	Virtual Environment
VR	Virtual Reality
WIPO	World Intellectual Property Organization
WTTC	World Travel and Tourism Council

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1 Introduction

The tourism industry serves as one of the major economic lifelines for a country as travelling has become a way of life for modern man. It has even greater potential for a developing country like Nepal, where people's livelihood heavily depends on the potential tourists' buying capabilities. The tourism industry helps a country's national output and contributes to the country's foreign reserves (UNWTO 2010).

In Nepal, the tourism business is one of the major sources of the economy. According to the World Travel and Tourism council research, Nepal's tourism sector generated 1.94 billion euros in revenue and supported 1.05 million jobs directly and indirectly (The Kathmandu Post 2020). Nepal is very rich in ancient cultures and has one of the most spectacular sceneries in the world. It carries the vast potential for adventure and unique experiences. Different tourism opportunities are available in Nepal, which attracts the attention of both national and international tourists. However, because of various constraints and barriers like geographical structure, economic conditions, pandemics, natural calamities, health conditions, age, etc., physical tourism is not always possible. In such a scenario, the interested tourists have no other options for physical tourism.

The innovation of technology has opened a new dimension of tourism for those tourists who could not prefer physical tourism. Technological advancement in the field of virtual reality could allow tourists to visit their desired places despite obstacles to physical tourism. Virtual Tourism is essentially a hybrid concept that merges both notions of technology and tourism. Virtual tourism facilitates tourism experiences travelling nowhere and covers a broad spectrum of digitally mediated reality (Stainton 2020). VR is defined as the use of a computer-generated 3D environment which can be also called a 'Virtual Environment' where one can navigate and interact resulting in real-time simulation through a single or more of the user's five senses (Guttentag 2010).

1.1 Background

The research is based on the survey strategy that was conducted in the Lappeenranta-Lahti University of Technology-Lappeenranta unit to analyze the feasibility of Virtual Reality (VR) in the tourism industry of Nepal and to propose a business concept that integrates VR technology and the tourism industry of Nepal.

The study includes content analysis to define and describe the keywords with the importance of virtual tourism in Nepal. Then the first survey was conducted among the domestic tourist of Nepal to identify the market potential of VR tourism. Simultaneously, the second survey was performed for the VR related companies operating in Europe to evaluate the trend and consumer behaviour towards the applications of VR technology. At last, the business concept related to VR tourism was introduced and its feasibility was tested to merge VR in Nepal's tourism sector.

After the outbreaks of COVID-19 in 2020, the tourism industry is considered one of the most affected industries in the world. The restrictions imposed by the local and foreign government authorities have impacted the tourism industry globally. When the author studied the impacts of COVID-19 focusing on the tourism industry of Nepal, it was observed that the flow of internal and international tourists in Nepal has plummeted. Furthermore, the author also noticed that Nepal has a huge market and opportunities for physical tourism. But unfortunately, physical tourism is not always possible in Nepal as the country has its own barriers. Virtual tourism has thus assumed greater significance and can be harnessed to overcome this new reality necessitated by the pandemic as well as other limitations. Moreover, the author realised the potential of virtual tourism and aims to integrate VR technology with the tourism industry of Nepal.

VR technology is a new and evolving technology. It is not well established in all countries and not everyone has access to it. VR technology is relatively new in Nepal and unfortunately, no reliable research paper close enough to this research topic has been found

during this research. In the preliminary study, the author identified that VR technology is excessively used for business purposes in European countries compared to the rest of the continent.

The market size of VR/AR in the European continent was 28 billion in 2021 and is predicted to rise to 250 billion US dollars by 2028 (Statista 2022). The production of VR/AR in Europe was worth the value of 700 million euros in 2015, which was 25% of the global production. In addition to this, the author noticed the pattern of smartphones that enters the “Slope of enlightenment” in 2007. It took 9 years in Europe to reach the level of 50% adoption rate of smartphones and today one-third of the world population uses them within 10 years time interval (Edita et al. 2015). The author assumes that a similar pattern will be repeated in the case of VR/AR, and it could enter the “Slope of enlightenment” in the coming years. So, the author aims to conduct a second survey in European countries for analyzing VR related business activities. Besides, out of the top 10 innovative countries in the world, 7 are from Europe (WIPO 2021). This also encourages the author to conduct a second survey in European countries.

After the preliminary research in this domain, the author decided to conduct the feasibility test of the business concept “VR Tour Centre” for implementing VR technology in the tourism industry of Nepal. The tour centre aims to provide virtual tourism services to its customers who could not prefer physical tourism due to various reasons.

1.2 Research aims, Objectives and Scope

In this subchapter, the author explains the Research aims, objectives and scope of this research.

Aims and Objectives

This thesis aims to investigate the feasibility of Virtual tourism in Nepal through the application of modern cutting-edge technology (Virtual Reality). Also, it aims to propose a business idea which merges the VR technology in the tourism industry of Nepal. The

business concept intends to provide an opportunity for tourism experience to the internal tourists of Nepal who are deprived of physical tourism due to various constraints and barriers.

Scope of the study

This thesis has a wider scope from the perspective of the adoption of VR technologies in the Nepalese tourism industry. The major competence of this study is to analyse the benefits of VR in the tourism sector. However, it is a newly introduced concept that will provide the theoretical framework and examine the market potential of Virtual Reality in Nepal.

Research Questions

Nepal has a high potential for physical tourism, and it has always been a significant source of income for the country. However, physical tourism is not possible all the time due to various limitations. In such scenarios, the physical tourism of Nepal is affected where tourists have no other arrangement for physical tourism. Based on these problems, the following research questions were developed to study the scope and feasibility of Virtual Reality (VR) application in the tourism industry in Nepal.

Is the Virtual Reality (VR) technology feasible in the context of Nepal for developing its virtual tourism business? What is the trend and activities of VR technology in Europe?

1.3 Structure of the thesis

This research contains 1 major research question with its single sub-question (see Sub-chapter 1.2). The research is carried out through an explanatory method. The research initially started with the preliminary research which was conducted before within the same domain of Virtual Reality (VR) and the tourism industry of Nepal. Table 1 illustrates the summary of the flow of research sequentially one after another.

Table 1. Input and Output of each chapter of this research

<i>Input</i>	<i>Chapter</i>	<i>Output</i>
Preliminary research and overview of background information.	<i>Introduction</i>	The research aims, objectives and the scope of this research.
Define and discuss the major concept associated with this research.	<i>Literature review</i>	Concept of Virtual Reality, Tourism Industry of Nepal and Feasibility Analysis.
Methodological choice and collection of primary and secondary data.	<i>Methodology</i>	Detailed information about applied methods, sample, and context.
Empirical data analysis of the answers to the survey question.	<i>Result</i>	Provides the information obtained from analysed data.
Using a different tool to check the feasibility of the proposed business idea.	<i>Feasibility Analysis</i>	Provides information about the feasibility of the business idea.
Discuss the findings of the result obtained from the survey and compare the outcomes with the Literature review of this research.	<i>Discussion</i>	Represents the discussion of findings, limitations of the research, and further recommendations.
Evaluation of the results.	<i>Conclusion</i>	Provides a specific decision.

The first chapter i.e., the Introduction chapter provides the overview of this research with its background information, aims and objective, scope, and the research question. The second chapter is a literature review and theoretical analysis which provide detailed information about important concepts and various other aspects of Virtual Reality, the tourism industry, and their potential interconnection in the context of Nepal.

Chapter 3 covers the methodological part which outlines the methodological choices, and ways of data collection and data analysis to show the choice of research design. Chapter 4 of the thesis illustrates the findings of the research question and outlines the breakdown of results that are obtained from the empirical study. Chapter 5 shows the feasibility test of the business concept based on VR technology and the tourism industry of Nepal.

The 6th chapter covers the discussion part of this research where gathered data is analysed and findings are explained. Finally, chapter 7 is the conclusion of this research. The conclusion attempts to summarize and highlight the important findings of this study.

2 Literature Review

The chapter introduces important concepts and various other characteristics associated with Virtual Reality and helps in acquiring the knowledge of recent activities in this domain. Furthermore, this section also aims to investigate the application of Virtual Reality in different industries with a focus on Virtual Tourism. Moreover, the tourism industry of Nepal is examined and the importance of VR in the tourism industry of Nepal is studied.

2.1 Virtual Reality

The definition of Virtual Reality differs when explaining the various features believed necessary to constitute an experience as VR (Yung & Khoo-Lattimore 2019). Lavallo defines Virtual Reality as an inducing targeted behaviour in an organism by using artificial sensory simulations, while the organism has little or no awareness of the interface (Lavallo 2016).

In the VR system, the level of immersion may influence the feelings of the presence of the user (Guttentag 2010). The experience of VR can be explained by its capacity to offer physical immersion where the user is psychologically present and isolated from the real world (Gutiérrez, Vexo and Thalmann 2008). Sanchez & Slater (2005) defined presence as a sense of being in a VE rather than where the user's body is located. The sign of presence is when the users show the same behaviour in VE as s/he would react to real-life situations. For providing high-quality data to the user's senses, feelings of the 'presence' are influenced by the VR system.

The interaction of VR technology with the virtual environment can be pivotal in three systems of VE. First, when the user is fully covered by the VE and if s/he has no encounter with the physical world then it can be said to be a 'fully immersive system' within the VE. Second, when a person has partial interaction with the real world then, he/she is in a 'semi-immersive system' environment under the VR technology. Last, when the user experiences

the VE by fully interacting with the physical world then the user is in the ‘non-immersive system’ VE under the technology of VR (Gutiérrez et al. 2008). Since the emerging VR-type technology and modern VR systems are highly sophisticated, it is not surprising that the capacity of the VR system provides high-quality sensory data (Matzen et al. 2017).

According to Costello (1997), the immersive system requires two different output devices, which are HMD (Head Mounted Display) and CAVE (Cave Automatic Virtual Environment), to provide realistic experiences of the Virtual Environment for the users. Such a system requires a graphics card, software, tracking system, and high processor hardware to reach a maximum level of realism for the users’ experience. The below table shows the characteristics of the Immersive system i.e., HMD and CAVE, and also the characteristics of the non-immersive system.

Table 2. Characteristics of the VR system (Costello 1997)

	<i>Immersive system</i>	<i>Impressive system</i>	<i>Non-immersive system</i>
	HMD	CAVE	
<i>Size of the Environment</i>	Life-size is real	Life-size is real	Smaller-scale
<i>System requirement (Resource requirement)</i>	High performance of software and hardware	High performance of software and hardware	Low performance of software and hardware
<i>User navigation control</i>	Device (e.g., wireless controller) Body movement (e.g., turning head, walking)	Device (e.g., data gloves, Joystick)	Device (e.g., mouse, keyboard)

<i>Virtual environment presentation</i>	Projected in headset	Projected to the fixed wall of the room	Displayed on the desktop monitor
<i>User awareness of the world</i>	Low	Low	High
<i>Feedback on user movement</i>	Responsive to user head position and angle	Responsive for the controller movement	Responsive for the controller movement
<i>Realism</i>	High	Medium	Low
<i>Sense of presence</i>	High	Medium	Low
<i>Example</i>	HTC Vive, oculus rifts	CAVE	Desktop system

In semi-immersive and non-immersive systems, users can experience the VE through a high-resolution monitor (Park et al. 2018). The system does not require any special equipment and high processor hardware compared to the immersive system, but the user may not experience the similar quality of VE in the semi-immersive and non-immersive system as compared to the immersive system.

2.1.1 Technologies associated with Virtual Reality

VR technology is growing its popularity rapidly since the revealing of the Oculus Rift in 2013 which served as a milestone for the VR industry since it rekindled the public interest and made VR relevant technology again. The improvements in technology have enabled VR to attain the expectations it had set 30 years earlier. The reduced cost of development and manufacturing has lowered the price of VR which paves the road for wider adoption of the technology.

Head-mounted displays (HMDs) serve as the main component of VR sets. HMDs refer to wearable devices that the user wears on their head. The HMD fully isolates the user's vision from their physical surroundings (Virtual Environment), generated by the VR displayed on the HMD. There are two types of HMDs which are (standalone and tethered) HMDs. Standalone HMDs are equipped with a built-in computer that generates the virtual environment they display. Whereas tethered HMDs require connection to an external computer via a cable. The user interacts and manipulates the objects in a virtual environment with the help of various interactive tools and techniques that have been developed such as: pointing with a beam, leap motion, and image plane interaction. (Dionysious 2019)

Tracking refers to a technique to track the position or movement of the device that is tracked which is an important feature of modern VR. There are three types of tracking techniques. Rotational 3-degrees of freedom refers to the tracking of the rotation of the HMD that enables the user to change their perspective as they turn their head and look around in the virtual environment. Translational head tracking is a process where the position of the user's head is tracked, and the user can change their position to change their viewpoint. The motion parallax cues used help to see the depth cues by looking from different angles. Positional 6-degrees of freedom is considered the best in terms of user experience and is mostly used among the three types of tracking. These tracking types are also applicable for tracking the controllers used or other body parts of the user. (Nykänen 2021)

2.1.2 Development and Adoption of Virtual Reality

The period from 1960 to 1980 could be considered the first phase of VR development. The necessary characteristics or features of VR were slowly being developed; the basics for haptic feedback were one achievement of this period and in the applications, front flight simulators progressed rapidly. The period 1980 to 1990 was the technological development phase of VR as technology-specific for 3D interaction was rediscovered and the virtual reality display system was given the name HMD. The term Virtual Reality was coined during this period by Jaron Lanier in 1987. The interval between 1990 and 2000 is known for experimenting with the applications of VR. The gaming industry was one of the earliest

adopters of this technology. Industries belonging to the transport business such as automobile, aeronautics, aerospace, and maritime started VR to design the vehicles and later drive them. The medical sector also started experimentation in this phase. In addition, the year 2000-2010 is considered the decade of industrial maturity as the application of VR evolved into maintenance and training using simulation to control industrial processes. Since 2010, VR technology is in the phase of deployment towards a larger segment of the public due to the reduction in the cost and increase in the level of performance. (Bruno 2018)

The global market size of VR, including AR (Augmented Reality) and MR (Mixed Reality), was 28 billion in 2021. It is forecasted that, by 2028, the market would rise over 250 billion US dollars. Moreover, it is predicted that VR/AR/MR would generate over 23 million jobs worldwide by 2030 (Statista 2022).

2.1.3 Applications of Virtual Reality technology

If we go through the history of VR, the first VR was patented in 1962 for entertainment purposes. The first VR device called ‘Sensorama Simulator’ offered a simulated motorcycle ride through New York City with 3D images, wind effects, sound effects, aromas, and vibrating seats for the rider. Besides, airlines also use VR for in-flight entertainment to provide comfort to their passengers during their flight time. Qatar Airlines is an excellent example that uses VR in-flight apps. (Jasoren 2020)

The education sector is also one of the major applications of VR technology. It has a high potential to be used for heritage sites, museums, and other educational methods. VR is highly used for educational purposes in the field of manufacturing and science in general. especially when the students are in one country and need to visit another country for educational purposes. The use of the VR system could solve this problem with the help of a virtual tour. There are already many examples of the use of VR for such educational purposes. One of them is the ‘Virtual Reality Gorilla Exhibit’ which was organized by the zoo of Atlanta for the students. (Guttentag 2010)

Medical science is also implementing VR technology in solving their concerns. Both the doctors and patients use VR in various ways to address their necessities. Professors use VR to train doctors to perform surgery. The advancement in VR technologies can assist the surgeons during operation in simulation and navigation by accurate instrument guidance and enhance the education of trainee doctors. (Sakai et al. 2020)

2.2 Virtual Reality in the tourism industry

In the context of tourism, VR generates a virtual environment (VE) by the provision of synthetic or 3D-360 degree real-life, captured with a capacity of fully immersive, semi-immersive, or non-immersive VR system which allows virtual touristic experiences that stimulate the senses of the user for the tourism purposes (Beck et al. 2018).

2.2.1 The technology used in virtual Reality tourism

Apart from the technology required for normal VR application, VR videos and photography are the main technology that is necessary for VR tourism (Wagler & Hanus 2018). In this sub-topic author discusses the overview of VR tourism videos and photos.

VR tourism video: VR tourism video is much more like a normal video that can be viewed on websites or social media (Matzen et al. 2017). However, there are few differences between a VR video and a normal video (Wagler & Hanus 2018). In VR videos, the user can explore the entire scene while the video is being played, whereas, in a normal video, it is not possible to explore the entire scene while the video is running (Immersion VR 2020). For capturing the VR tourism video, a special camera (omnidirectional camera) is used to film every angle of the destination at once. After filming, the footage is taken back to the studio and stitched together to produce a VR video (Fung et al. 2005).

There are two types of VR tourism videos which are Monoscopic VR tourism videos and Stereoscopic VR tourism videos (Fung et al. 2005). In the Monoscopic VR tourism video, regular devices such as mobiles and computers are used to view the tourism video where a user can drag across the scene to rotate the field of view and can also turn his/her head to explore the scene (Immersion VR 2020). Whereas a VR headset is used to view the tourism video in Stereoscopic VR tourism videos. It takes more time and cost to produce a Stereoscopic VR tourism video but provides a more impressive travel experience in comparison to a Monoscopic VR tourism video. A user can also move their head to explore the environment realistically. (Fung et al. 2005)

VR tourism photography: VR tourism photography is defined as the production of 360-degree images of a travel destination from which the images are designed to be viewed on regular devices such as computers and mobiles (Immersion VR 2020). It is much more like a VR tourism video but with still images. A user can scroll or swipe across the image to view the entire scene. (Matzen et al. 2017)

In VR tourism photography, the images are taken with state-of-the-art DSLR (Digital single-lens reflex) cameras on specialist rigs for capturing 360-degree angle images (Immersion VR 2020). The use of DSLR cameras provides a higher resolution image for VR tourism photography as compared to normal non-VR tourism videos (Matzen et al. 2017). The 360 images are very cheap and quick to produce and can be uploaded on websites and social media as regular images (Immersion VR 2020). However, 360 images are not impressive for the users' experience in comparison to VR tourism videos (Matzen et al. 2017).

2.2.2 Application of Virtual Reality in the tourism industry

In the tourism industry, VR can be used in different areas with different aspects (Wagler & Hanus 2018). With the rapid evolution of technology, the use of VR within the tourism industry is ever-expanding. Some of the major applications of VR in tourism are discussed below:

Marketing: Nowadays, the VR system is widely used for marketing purposes in the tourism sector. From the viewpoint of marketing, VR has a high potential to develop sales and promotional materials for tourism. There are many websites available on the internet where the tourism service providers post their touristic destinations in the VR-video model and consumers can visit such sites virtually with the help of VR devices. The VR system provides a realistic view of tourist attractions such as tourist places, hotel rooms, museums, etc., for the tourists before they decide to purchase the service. (Guttentag 2010)

Virtual Tour: Virtual Tour is one of the major applications of VR technology in the tourism industry. The definition varies from one researcher to others. VR tour can be defined as a simulation of an existing location that is composed of a sequence of video images (Osman 2021). The VR tour allows users to experience the realistic VE of a particular tour without travelling a single step. In addition, VR tours are applicable in education, preservation of ancient heritage, promoting touristic places and many more which saves cost and time, and provides easy access to visit desired places compared to physical tours.

Planning and management: In terms of planning and management, VR technologies have widened their potential scope in the tourism sector. VR devices help tourists to plan their trip by providing a realistic environment and detailed navigation of the destination (Anand et al. 2018). VR is also used as an important tool for communication where a tourist can plan their trip with a member of an appropriate group and receive inputs from such individuals (Guttentag 2010).

2.2.3 Future scope of Virtual Reality in tourism

The evolvement of VR technology has already motivated different tourism companies to see towards the future. We can find several articles related to their prediction and expectation of future VR developments and their uses in the tourism sector. In 2014, the famous global travel search engine `Skyscanner` mentioned in its article titled `The Future of Travel 2024`

that VR will have a high impact on touristic experiences. They forecasted that VR would become a new form of a showroom with an unbelievable 3D taste of a destination that allows the tourists to experience things as they would. The use of haptic technology in the future may also influence the system of booking the travel destination (Shaikh et al. 2018).

Other research papers predicted that when the level of VR immersion increases, tourism customers will be able to visit VR spaces more comfortably and in realistic surroundings. A new business model 'try-before-you-buy' will be introduced in airline businesses where VR spaces or storefronts will be the mandatory features for the airlines which allow a customer to experience their trip virtually before they buy the tickets. It is also predicted that recreating the trip of a traveller after their return will be one of the most valuable services of VR applications in the future (Lundy 2015). Moreover, the research conducted by Markus Heinonen (2017) also found that enterprises are highly abducting VR technology for their business purposes and concluded that the use of VR in the enterprise will rise further in the future which may rapidly increase the current number of statistics regarding the use of VR in upcoming days (Heinonen 2017).

In addition, different survey research has been carried out in different countries regarding the uses of VR technology in tourism. The research carried out in Germany shows that around 49% of the sampled group were interested in the use of VR for selecting their holiday destination. Whereas 38% of the sampled group were not interested in using VR for tourism purposes even if it were provided freely. Interestingly, the remaining 13% of the sampled group were interested in purchasing VR content for tourism purposes. (Immersion VR 2020)

Most researchers believed that the future use of VR technology in the tourism industry would rapidly increase in the coming years. Their predictions support the concept of merging VR technology with Nepal's tourism for providing virtual tourism services to its customers.

2.3 The tourism industry of Nepal

The tourism industry is considered an export business that involves the selling and buying of goods and services, with compensation paid by the visitor or buyer to the seller (WTTC 2018). It is the major source of earning foreign currency and increasing the output of the host country. It is also known as the world's largest economic sector which creates jobs, reduces poverty, and fosters development (Smith et al. 1998). WTTC's annual research in 2018 reported that tourism generated approximately US\$ 8.8 trillion and contributed 319 million job opportunities to the economy of the world. According to the WTTC, over 600 million international tourists visit different parts of the world every year (WTTC 2018).

In Nepal, the tourism industry is considered one of the prime contributors to the national economy. The tourism sector generated NRs 240.7 billion in revenue which accounted for 7.9% of Nepal's GDP in 2018 when the annual arrival of international tourists was marked as one million for the first time. Meanwhile, approximately 5 million people move from one place to another for domestic tourism purposes which cover 56% of the total revenue generated from the tourism industry in 2018. (Prasain 2020)

The statistics change every year. In 2020, COVID-19 had adversely affected the tourism industry of Nepal. People were restricted in travelling from one place to another. In this unusual situation, VR tourism could be a suitable option even though it would not generate trillions of dollars and provide millions of jobs overnight.

Moreover, Nepal is very rich in ancient culture and has one of the most dramatic sceneries in the world with tremendous potential for discoveries and unique experiences. Natural scenic landscapes and biodiversity, incomparable cultural heritage, high Himalayas, and different peculiarities have made Nepal a popular destination in the world (MOFA 2020). Nepal has a different types and a variety of activities in the tourism industry. In the section below, the author discusses some of the important types and famous activities of Nepal's tourism which have been attracting tourists for the past decades in Nepal.

Major types of Nepal's tourism industry

There are many types of tourism available in Nepal. However, the author below discusses only those types of tourism that the government of Nepal considered the major ones by publishing them on their official websites.

Religious Tourism: Religious tourism is one of the most popular forms of tourism in Nepal. Nepal is a multi-religious country where every year hundreds of thousands of people following different religions travel for religious purposes. Hinduism is the main religion in Nepal and Pashupatinath Temple in the capital city is considered the most important religious site for Hindus. Many other Hindu pilgrimage sites such as Gosaikunda lake, Manakamana Temple, Swargadwari etc. attract Hindu tourists from all around the world (MOFA 2020). Besides Hinduism, Buddhism is the next most adopted religion in Nepal. Gautam Buddha, the founder of Buddhism, was born in Lumbini, Nepal. UNESCO has declared Lumbini a world heritage site. Other famous Buddhist sites in Nepal include Boudhanath stupa, Swayambhunath temple, Namobuddha, Muktinath, etc., (MOFA 2020).

Cultural and Heritage Tourism: Nepal is a multi-ethnic nation with over sixty different ethnic groups living in different parts of the country. It is a common garden of diverse communities and castes. Every community follows a different culture and has its specific languages, and ways of living. Nepal's greatest attraction is its vast cultural diversity. UNESCO has listed 10 sites in Nepal as world heritage sites. Only in Kathmandu, there are seven world heritage sites within a walking distance. Kathmandu is itself a museum that is rich in the collection of archaeological, historical, and artistic objects that display historical and cultural significance (Chapagain 2008). In 2019, Lonely Planet ranked Kathmandu valley in the top five travel destinations of the world, whereas Tripadvisor.com ranked Kathmandu valley as the 19th best tourism destination in the world.

Wilderness Tourism: Tourists can visit Nepal and can explore the untouched landscape that boasts from the steamy jungle in plain land to the icy highest peaks of the world. Various activities of adventure can meet and even surpass the imagination of tourists. There are

fifteen National and Wildlife parks where tourists can see different rare species of animals and birds, including the Asiatic rhinoceros which is only found in Nepal. (Bhatta 2015)

Major activities of Nepal's tourism industry

Nepal is suitable for both adventurous and non-adventurous activities. Due to the geographical location, diverse culture, appropriate climate, natural beauties, etc., there are many tourism-related things to do. Some of them are birdwatching, mountain flight, rock climbing, jungle safari, etc. In the following paragraph, the author discusses the major activities of tourism that attracts the highest number of tourists.

Mountain climbing: Nepal has eight out of the 10 highest mountains in the world. Peaks such as Annapurna, Machhapuchhre, Dhaulagiri, Kanchenjunga, and Ganesh Himal provide a massive attraction for tourists to visit Nepal year after year. There are 3,310 walking and climbing peaks above 5,500 m in Nepal. The government of Nepal has estimated that more than 1,600 summits are virgins that no one has ever stepped on. The country opened its peaks in 1994 for climbers from around the world and since then the Himalayas of Nepal have become a great auditorium for mountaineering activities. To meet the ultimate challenge, every year thousands of national and international tourists challenge themselves to reach the top of the earth (Parsain 2009).

Trekking: Nepal is known as the country of paradise for trekkers with a combination of natural beauty and cultural diversity. Trekking in Nepal is a lifetime experience for a tourist; hence thousands of tourists visit Nepal with the intention of trekking as there is a variety of trekking options to choose from. Everest Base Camp, Annapurna Base Camp, Annapurna Circuit, Poon Hill trek, Langtang trek, Manaslu trek, Gokyo trek, Upper Mustang Trek, Upper Dolpo trek, Kanchenjunga trek, Makalu Base Camp, Phoksundo lake, and Tilicho lake are some of the most popular trekking destinations in Nepal (Welcome Nepal 2020).

Rafting: Rafting is one of the best ways to experience the natural as well as the ethnocultural heritage of the country. Most of the rivers of Nepal originate from the high Himalayas. The continuous flow of water from high level to low level makes rafting more adventurous and exciting. The government of Nepal has opened 10 rivers for commercial rafting purposes. Out of them, the Trishuli river is the most popular rafting river in Nepal. The Karnali river supplies the most demanding rapids in the world. The rafting in the Sunkoshi River takes around 8-10 days to complete and has a length of 27 km. The Kali Gandaki is deep and takes five days of rapids. (MOFA 2020)

The above literature shows that Nepal has different types of tourism which are equally significant for internal and international tourists. In addition to this, it also discusses the major and famous adventurous activities that could be conducted in Nepal. The literature chapter 2.2.1 defines VR videos as similar to normal videos but filmed with a special omnidirectional camera from a different angle (Fung et al. 2005). This indicates that all the major types and activities of Nepal's tourism could be captured and transformed into VR videos. With the help of a simulator, a tourist can feel and carry out various types and activities of tourism. For generating the country's revenue, the government could charge some royalties on every virtual tourism video. Besides, virtual access to those types of tourism and activities saves the travel time of tourists, maintains sustainability, and reduces unnecessary life risks.

2.4 Virtual Reality in the tourism industry of Nepal and its importance

This subchapter illustrates the present situation of VR in the tourism industry of Nepal. Moreover, it also discusses the importance of VR technology in a particular industry.

VR in the tourism industry of Nepal

VR technology is an emerging technology that is relatively new in the context of Nepal. 'Nepal VR' was the first application launched in Nepal with the concept of Virtual Reality. It was introduced in 2017 to promote Nepal's tourism after the earthquake-affected Nepal in 2015. The "Nepal VR" app consists of 360-degree VR videos of different touristic places in Nepal. The developers claim that the video had 8000 downloads within the same year and has 100 to 200 visitors every day to the app (Bajacharya 2017).

Though the use of a VR system has already started in Nepal, the trend of employing VR technology is at a minimum level. The existing VR service companies lack to provide standard services with advanced VR technology. In Nepal, no VR related business company serves its customer with a fully immersive simulator where people feel the activities that they do.

Nevertheless, some travel companies have started to upload VR photos/videos of tourist places to their website for marketing purposes. The big hotels in Nepal have begun to use 360 VR videos of their property and VR photos of their guest rooms on the internet platform for attracting customers. Besides, some start-up companies are also engaged with VR related business recently, but no company has focused on the tourism industry, yet. The start-up business of combining VR technology and the tourism industry has wider opportunities in near future and could be one of the monopoly businesses in Nepal for certain years.

Importance of VR in the tourism industry of Nepal

Along with the application mentioned in Sub-chapter 2.1.3 and 2.2.3, there are also other uses of VR technology in the context of Nepal. Here below, the author discusses the importance of VR in the tourism sector relating to other external factors.

Geographical structure: Nepal is a landlocked country with an area of 147,181 sq. km. It is situated between the coordinates 28° N and 84° E (approximately). The country is divided into three geographical regions i.e., the Himalayan region, the Hilly region, and the Plain region (Nepal Visitors 2020). Terai covers 17 % of the total land within the altitude range from 60 meters to 305 meters, the Hilly region covers 68 % of the total land with an altitude range from 306 meters to 4,876 meters and the Himalayan regions cover 15% of the total land with an altitude range from 4,877 to 8,848 meters (Welcome Nepal 2020). Considering the topographical layout, the tourism industry of the Hilly and Plain region is not affected as the Himalayan region. It has 8 out of 10 world's tallest mountains including Sagarmatha (Mt. Everest), the tallest mountain in the world and over 3000 peaks above 6000 meters in height (MOFA 2020).

Every year many tourists attempt to visit the Himalayan region but only a few tourists can succeed due to its complex geographical structures. Among others, altitude sickness, frequently changing climate, and lack of infrastructure are the major obstacles. Nevertheless, the adoption of Virtual Reality technology can easily shut out this problem. First, the VR compactable 3D-360 degree videos of the Himalayan region should be created and uploaded to the VR platform. After that, every individual can download it (free/paid) through a VR set and can feel the realistic feeling of visiting the Himalayan region virtually.

Infrastructure: Infrastructure is also a major factor that affects the physical tourism of Nepal. Nepal has no waterways and railways. Additionally, airways are not possible everywhere due to the geographical structure of the country. Roadways are considered an important means of transportation for travelling to different parts of the country. About 40% of roads in Nepal are highways, of which 77% are not in good condition. In most of the

village areas, there are no roads, which is the reason that the basic infrastructure of tourism businesses like hotels, hospitals, water, electricity, telephone, etc. are not developed (Maharjan 2019).

This problem opens the door for VR technology applications in Nepal. With the help of VR, tourists can visit the remote areas of Nepal virtually even if there is no reliable infrastructure. The tourist can witness the realistic view of natural scenery in their desired locations without physically travelling to the exact place.

Digital preservation of old cultural heritage: Nepal is very rich in cultural diversity, and it is known as the land of treasure for ancient monuments and cultural heritage sites. UNESCO has listed eight cultural heritage sites of Nepal as world heritage sites. Within Kathmandu valley alone, there are seven cultural world heritage sites i.e., Pashupatinath, Boudhanath, Kathmandu Durbar Square, Patan Durbar Square, Bhaktapur Durbar Square, Swayambhunath, and Changunarayan Temple. Lumbini, the birthplace of Lord Gautam Buddha is another important heritage site of Nepal that is listed as a world heritage site. These old monuments in Lumbini date back to the 13th century. Besides these, Nepal also has many other old heritage sites and ancient monuments which are not listed as world cultural heritage sites but have particular importance (Chapagain 2008).

In 2015, a major earthquake of 7.8 (Mw) hit Nepal which affected about 750 monuments including world heritage sites (World Monuments Fund 2020). The affected monuments and heritage sites are now in the phase of re-construction, but they have lost their originality and the structures of the ancient heritages are slightly different than before. The lack of skilled manpower and the lack of knowledge of ancient materials used in ancient construction has been the main problem. Earthquakes are just an example; increasing population with unmanaged urbanization, lack of renovation on time, fire, and theft of ancient monuments are other major problems that affect the significance of ancient monuments and cultural heritages.

However, if those cultural heritage sites and ancient monuments had been preserved digitally before they got affected, then now it would be possible to witness them virtually with their original structure. Nevertheless, there are still many other cultural heritages and monuments which are in very poor condition. That cultural heritage and monuments should be preserved digitally, and compatible with the VR system. This helps tourists to visit them virtually if some calamity or disaster happens.

Health condition: In 2018, the average life expectancy of men was 68.99 years, and the life expectancy of women was 71.9 years. Compared to other 192 countries, Nepal occupies the position of 126 in terms of average life expectancy. This indicates that the health condition of average Nepalese people is not so good. (Country Economy 2018). According to the World Bank (2020), about 186,457 of the total population of Nepal are physically challenged. Due to the geographical structure of Nepal, physical travelling is impossible for such a group of people.

VR could be one of the best options for sickness/physically challenged people who want to visit different parts of Nepal. Just because of their health condition, they don't need to curb their feelings about travelling. The realistic simulated virtual tour can take them to their desired place without affecting their health.

The average income of people: Nepal is listed among the poorest countries in the world. In 2019, the annual GDP per capita income of Nepal was \$1,071 (Worldbank 2020). About 25% of the total population of Nepal is under the poverty line, living their life under 50 cents per day (The Borgen Project 2020). The unemployment rate of Nepal in 2019 was 1.41% of its total working population (Statista 2020).

Travelling for tourism is a nightmare for those who are under the poverty line and for unemployed people. It is also very difficult for those people with a low or medium-income to travel frequently for tourism purposes. However, VR could be very helpful for those who want to travel economically. The cost of VR travelling is much cheaper compared to physical

travelling. VR reduces the cost of transportation, hotel, food, entry fees, etc. of the users, yet provides realistic experiences of the desired tour.

COVID-19 and other infectious diseases: Almost every decade, there are one or more pandemic outbreaks in the world, some major and some minor ones. For example, the flu pandemic outbreak in 1889, the Spanish Flu outbreak in 1918, the AIDS outbreak in 1981, Swine Flu outbreak in 2009 and COVID-19 outbreak in 2019 (Live Science 2020). Whenever this kind of pandemic occurs, people stop unnecessary luxury travelling to protect themselves from those diseases. We can see the impact of COVID-19 which has completely changed the lifestyle of the people and has devastated the travelling industry. To control the spread of COVID-19, the governments of different countries applied the strategy of Lockdown where people are restricted to travel from one place to another. This strategy directly affects the people who love to travel to different places domestically or internationally (World Economic Forum 2020).

Like other countries, the government of Nepal also restricted its people to travel from one place to another during the COVID-19 pandemic which had affected the travel enthusiasts. In this unusual situation, VR could be the best substitution for physical tourism where users can experience a realistic view of desired tourist places without leaving their residence and without having any health risks.

Sustainability: According to the UNWTO, sustainable tourism is defined as “Tourism that takes full account of its current and future Economic, Social and Environmental impacts, addressing the needs of visitors, industry, environment, and host communities”. The practical application of the concept of sustainable tourism leads to the visiting of some tourist places without impacting the environment, society, and tourism (UNWTO 2020).

The concept of sustainable tourism is only documented in Nepal. There is no practical implementation of it. For example, the world's highest peak Sagarmatha (Mount Everest) receives more than 100,000 visitors and their waste every year. On average, each person

generates 18 pounds of trash among which most of the waste is left in the mountains. Nowadays, the mountains are full of trash, and it is a big challenge for the government to clear up the mess. In 2019, the Nepal government cleared about 22,000 pounds of trash from the mountain (National Geography Society 2019). Besides overcrowding, ancient cultural heritage sites are also destroying their original structure and safety. These are just examples; many other touristic places and the cultural heritage of Nepal are affected by physical tourism.

This problem could be solved very easily with the help of VR technology. The government can limit the number of tourists in a particular touristic area where the flow of tourists is high. Those tourists who didn't get a chance to visit that particular place physically would always have an opportunity to visit that particular place virtually with the help of VR. The strategy of implementing VR technology could help Nepal in its pursuit of sustainable tourism.

3 Research methodology

This chapter aims to provide a detailed explanation of the methodologies that are used during the study. In this chapter, three different sub-chapters further explain the detail-oriented descriptions for clarifying the methodological choices and provide information about the data collection and the analysing process.

3.1 Methodological choices

This research is based on the exploratory methodological approach followed by the survey strategy. Exploratory research allows the author to investigate the research question that has not been explored or studied before (Swedberg 2020). In the context of the study, there is no research paper published yet that explores the feasibility of VR technology in the tourism industry of Nepal. The author aims to explore the feasibility of VR technology in Nepalese tourism for the first time which illustrates that this research is exploratory by nature. Besides, the survey strategy used in this research helps the author to gather necessary information from respondents for exploring the feasibility of Virtual Reality technology in the tourism industry of Nepal. The mixed-method approaches were used to design the survey questions to seek the data as an answer to the research questions. Both open-ended questions and closed-ended questions were used in the study. The open-ended questions denote that the survey was qualitative by nature while the closed-ended question indicates that the survey was quantitative by nature. The survey was mostly quantitative as it consists of many closed-ended questions. However, the overall research was approached qualitatively as it seeks to explore the feasibility of VR in the tourism industry of Nepal. Besides, the literature analysis and some survey questions of this research were approached qualitatively.

In the survey, a considerable quantity of data was gathered to maintain its validity. The survey was conducted among the internal tourists of Nepal to investigate their interest and capacity for VR tourism. Besides, another survey was also conducted in Europe to know about the ongoing trend of VR related businesses. In both surveys, a cross-sectional time

was selected where the author can collect data from many individuals at a single time (Lauren 2020). While the secondary data for this research was gathered by reviewing different literature, articles, books, reliable websites, etc. within the related domain.

3.2 Data collection

In this section, the author explains the steps of data collection during the research process. Initially, some of the useful keywords like Virtual Reality, tourism industry, VR in the tourism industry, VR in the tourism industry of Nepal, and other words related to this research topic were used for searching the literature and theory analysis. In the literature search, the databases like Science Direct, Springer journals, Emerald journals, LUT finna, Scopus, and other academic websites were used to complete the preliminary search. The preliminary search was achieved by reviewing the books, articles and journals from the databases mentioned above. The initial review of literature enables the author to collect secondary data that was required to continue the research forward to find relevant information as well as the research gaps.

The primary data was of great importance to answer the research question (see Sub-Chapter 1.2). In this study, the primary data was collected by using the survey methods, and the survey was conducted electronically to get the responses from the respondents in a specific time frame. The electronic questionnaire was prepared on the Webropol platform provided by the Lappeenranta-Lahti University of Technology and was sent to the emails of internal tourists of Nepal and to the emails of different companies that are associated in VR related businesses in Europe.

3.2.1 Data collection from the internal tourist of Nepal (First survey)

For investigating the first part of the research question, the questionnaire was sent through emails to random domestic tourists of Nepal. The questions were mainly focused on the feasibility of VR tourism in Nepal during unusual conditions like the Covid-19 pandemic, geographical constraints, poor health conditions, ageing, lack of proper infrastructure, and

lack of finance. Besides, the survey questions also concentrated on the interest of respondents towards sustainable tourism and digital preservation of ancient heritage and monuments of Nepal.

To collect the data from the internal tourists of Nepal, 263 random internal tourists were contacted via email on 3rd November 2020. The contact information of internal tourists was collected from different tourism websites in Nepal. The selection process of internal tourists was sorted out based on their activities and comments on the websites. In this research, about 41% of the total respondents responded to the survey link. As the response rate of the survey was high enough, the reminder links were not sent again. The survey links were closed on 27th December 2020.

3.2.2 Data collection from European companies affiliated with VR technology (Second survey)

To answer the second part of the research question, the questionnaire was sent via emails to the European companies that are associated with VR businesses. The contact information of the companies was collected from the search engine (Google, Bing). The same platform 'Webropol' was used for conducting the survey. The survey questions focused on the ongoing business activities of VR technology in Europe to speculate on the feasibility of the VR tourism business in Nepal. Besides, this survey was also conducted to analyze the trend of VR in innovative countries to predict the market of Nepal for VR tourism.

As such, 270 companies were contacted through emails on 22nd January 2021. The response rate of the survey was only 3%. The survey links were sent as a reminder but still, none of the companies responded to the survey links. Finally, the survey links were closed on 20th March 2021. Since the response rate of the second survey was lower than expected and required to make an assessment the author needed to look for literature that could be evidential about the success of VR related business in the European market. The findings of the working paper published by Eurofound were the most reliable document accessed. The

paper that was studied to decide the European market trend for VR was “Virtual and augmented reality: Implications of game-changing technologies in the service sector in Europe” which was one of the series of five game-changing technologies that refers to advanced robotics, wearables, autonomous transport devices and blockchain. The series was published by Eurofound with reference number WPEF19004 with the title “Game-changing technologies: transforming production and employment in Europe”.

Europe is supposed to be a solid market in terms of the development and diffusion of VR technology and steady growth is expected in the market in years to come. Countries like France, UK, Germany, Netherlands, and Switzerland are among those that exhibit higher potential for growth of VR industries. Other countries like Finland, Denmark, Italy and Greece are among those which are signalling the potential for high growth in VR industries. The study suggests the adoption of VR is increasing in Europe but the rate of adoption in Asia is higher compared to Europe. The reason for the difference in adoption is due to the nature of Europe being traditionally more cautious during the adoption of new technology. However, once the technology is accepted in Europe the technology adoption accelerates much faster. Based on the snapshot of the global VR landscape which underlines distinct strengths of VR development in different continents, Europe is considered creative and hi-tech, the U.S is referred to as strong, while Asia is supposed as fast-growing. Academic research and the funding available are cited as crucial assets of the European market. (Eurofound 2019)

3.3 Data Analysis

After the data gathering process ended, analyzing the data started within the framework of research and keeping the research questions in context. The number of respondents in the first survey was satisfactory (107 out of 263). However, in the second survey, the number of respondents was limited (8 out of 273). The main causes for receiving less response in the second survey might be the use of ‘@info’ emails for sending the survey links to the companies and also the survey links were sent when there was a lockdown in Europe due to the Covid-19 pandemic. However, the gathered data was considerable for investigating the

second part of the research question since the trend reflected by the survey was similar to the literature studied to proceed with the research.

The first part of the RQ mainly focused on the feasibility of VR tourism in unusual situations. This RQ also helps to determine the interest and capacity of internal tourists of Nepal towards sustainable tourism and digital preservation of heritage and monuments. The survey links were sent to random individuals of Nepal, considering them potential internal tourists.

The first survey was conducted through an online questionnaire (Webropol) which had 10 questions. Questions 1, 2 and 3 of the survey intend to gather general information like age, familiarity with the technology and capability to engage with new technology respectively. Question 4 and 5 were used to explore the amount the respondent spends on recreational activities each month and their travelling intentions for tourism purposes, respectively. Questions 6, 7, 8, and 9 were developed to find the opinion of respondents regarding VR tourism in Nepal with consideration of health factors, time and geographical constraints, the infrastructure of Nepal, COVID 19 pandemics, and digital preservation of ancient heritages, respectively. Finally, question 10 of the survey supports the understanding of respondents' opinions regarding the integration of VR technology in the tourism industry of Nepal. There was also an option of "I do not want to answer", which helps to make the survey more authentic because if the respondents do not want to answer, they could choose this option rather than choosing the random option.

The survey questions 1-9 were close-ended whereas the only open-ended question in the survey was question number 10. The open-ended question allows the respondents to write freely that reflects the opinion of each respondent regarding the integration of VR technology in the tourism industry.

The second part of the RQ mostly focused on the recent condition of VR related businesses in Europe to investigate the interest of customers in VR technology and the economic expansion of VR related businesses. The RQ assists in analysing the ongoing business

activities of VR related businesses in Europe and enables the author to analyze the future scope of VR related businesses in Nepal. The online second survey questionnaire was also sent through an email to the European companies that are related to the VR businesses. The second online survey consists of 7 questions where questions 1, 2 and 3 intend to gather the general information related to the position of respondents, working experiences and the age of the company, respectively. The questions from 4 to 6 investigate the information related to the economic condition of the company, repetitive customers, and the impact of Covid-19 on their businesses, respectively. Additionally, the last question assists to find experts' opinions on the future and trends of VR related business.

The data gathered from the survey require it to be analysed with the appropriate tool. Different computer software such as Excel and MATLAB could be used for handling, managing, and analysing the collected data from primary and secondary sources. However, in this research, the author has used Excel software for analysing the gathered data obtained from the surveys. The outcome of the analysis is presented in Chapter 4.

4 Results of the survey

This chapter presents the response received to the survey questionnaire. The outcome of this study is categorized into two segments according to the different surveys applied in the research. The first part of this segment presents the outcome received from the internal tourists regarding the feasibility of VR in the tourism industry of Nepal for virtual tourism. The second part of this segment exhibits the survey result regarding the ongoing VR related business activities in Europe. The result of both surveys helps in analyzing if VR related businesses are suitable to integrate into Nepal's tourism industry for virtual tourism or not.

4.1 Data analysis and Survey results (First survey)

In this section, the author intends to cover all the results of the first survey that investigates the interest, capacity, and preference of internal tourists in Nepal. Furthermore, it also facilitates their advancement towards virtual tourism through VR technology. The following survey questions were sent to the internal tourists.

1. Which age group do you belong to?
2. Are you familiar with Virtual Reality (VR) technology?
3. How likely are you to adopt new technology?
4. How much (NRs) do you spend on your recreational activities per month?
5. How likely are you to travel for tourism purposes?
6. How likely are you to prefer virtual tourism over physical tourism considering physical disability, ageing, time, and geographical constraints?
7. How likely are you to prefer a VR tour during the uncertainties like COVID-19 pandemics?

8. Considering the infrastructure of Nepal, how likely are you to prefer physical tourism?
9. If ancient heritages of Nepal will be preserved digitally, how likely are you to visit it virtually?
10. How suitable would it be to integrate VR technology into the Tourism industry of Nepal?

Out of the 263 internal tourists approached, 107 respondents have replied to this survey. The response rate was 41% which ensures the reliability of the survey. The outcome of each aspect of information from the first part of the research question is discussed below:

The age group of the respondents

Figure 1 shows that out of 107 respondents, 80% belong to the age group between 18-25, 13% belong to the group of 26-33, 6% belong to the group of 34-40, and 1% belong to the age group between 41-47. There were no respondents above 48. Though the highest number of respondents belongs to the group between 18 and 25, that is just a fraction of internal tourists. The most likely reason for that might be technological access and digital adoption. None of the respondents chose the option “I do not want to answer.”

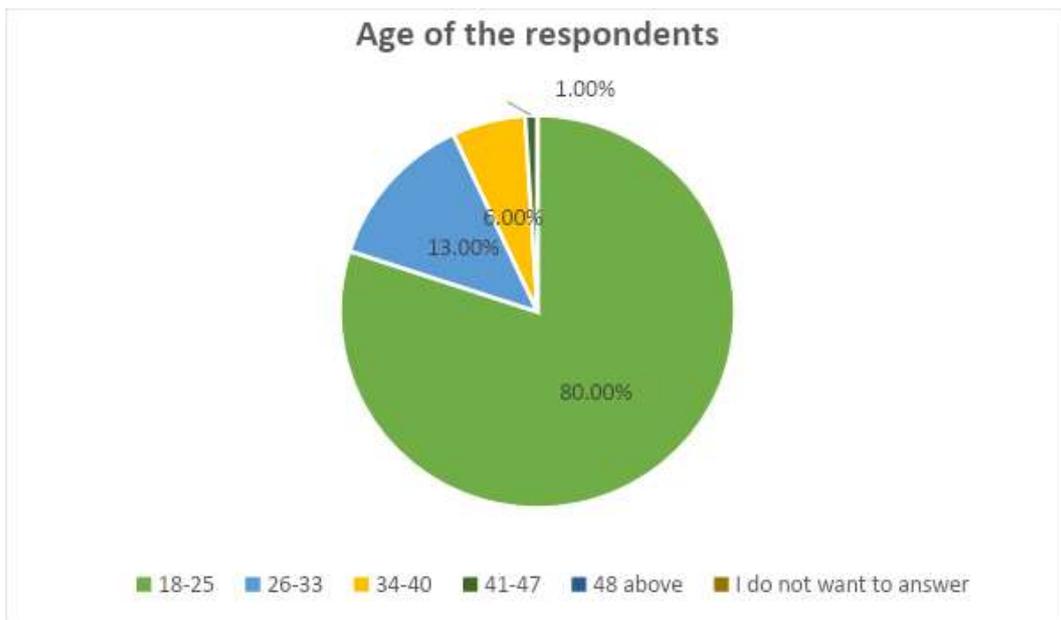


Figure 1. The age group of the respondents

Based on the data received from the respondents, it was noticed that younger internal tourists of Nepal have more access to the internet and technology. The highest number of responses are achieved from the same age group as the age of Generation Z, who grew up with digital toys. While a small number of responses were obtained from the older generation. The internet and technology access are the prime factors that differentiate the younger and older generation. Besides, the survey link was sent through the internet, which might have discouraged the older generation to respond as they need a device to return the survey link.

The result unveils the fact that Nepal might have a potential market for any technology-related businesses. The population of the age group belonging to the Gen Z is high in Nepal, who are already capable of using the internet, technology, and digital tools (see figure 2). This indicates that Nepal has existing customers for any technological business, where VR could be one of them.

Familiarity of respondents with Virtual Reality Technology

Figure 2 reveals the answer received in percentage concerning the familiarity with VR technology in Nepal. The result shows that about 66% of the total respondents were familiar with VR technology while 27% of the respondents were unknown. In this part, 7% of the total respondents did not reply to this question.

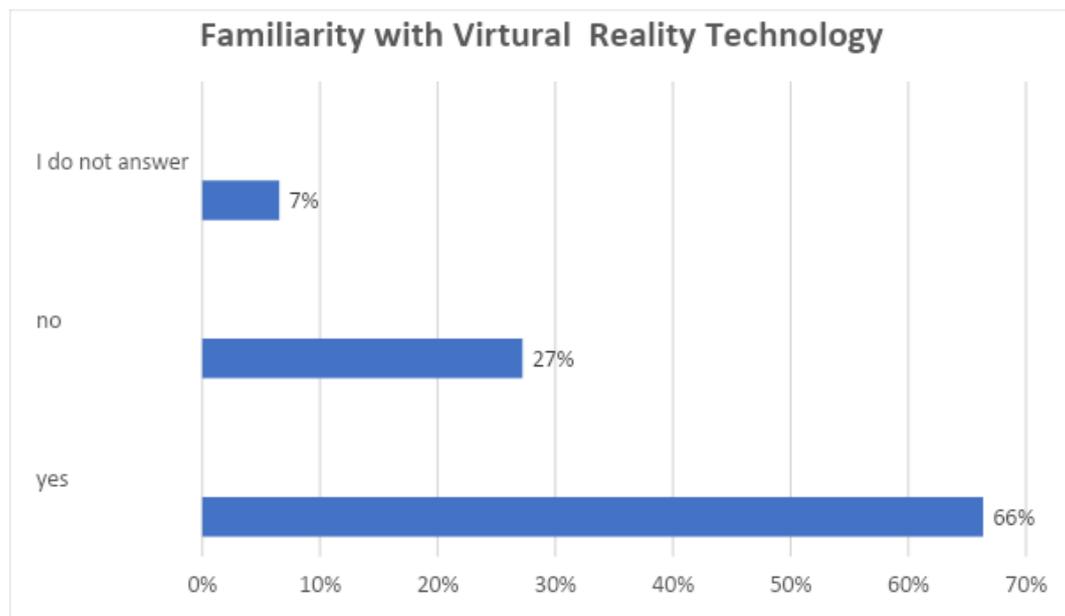


Figure 2. Familiarity of respondents with Virtual Reality technology

From the result, it is noticeable that one-third (majority) of the total respondents are familiar with VR technology. This indicates that Nepal has a huge opportunity for any start-up company related to VR technology. The company does not need to spend resources for familiarizing the technology to the general population through extensive marketing efforts. Moreover, this result provides a seal of approval for implementing VR technology in the tourism industry of Nepal as most domestic tourists are already familiar with VR technology.

Adoption capability of respondents with new technology

In this section, the respondents were asked about their willingness to adopt new technology on a 5-point Likert scale. From figure 5, it is visible that 25% of the total respondents replied that they are extremely likely to adopt the new technology, whereas 28% of them mentioned they are likely to adopt it. 40% of the respondents expressed that they were moderately likely to adopt the new technology. It was also noticed that only 4% and 3% of the respondents were 'less likely' and 'not at all likely to adopt the new technology, respectively.

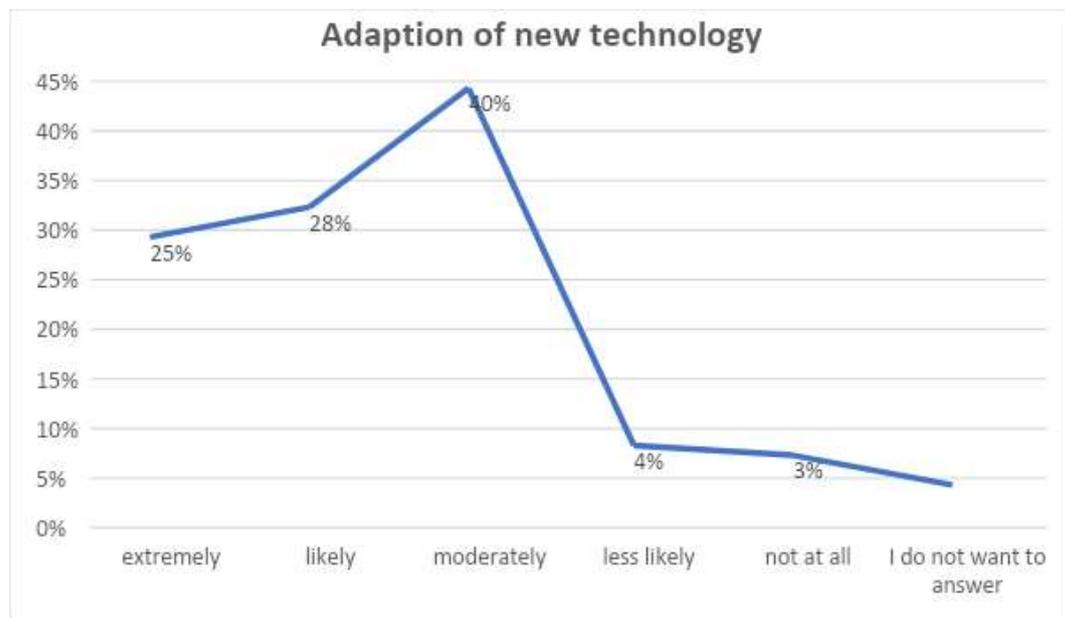


Figure 3. Adoption capability of respondents with new technology

The result illustrates that most internal tourists are capable of adopting the new technology which signifies that Nepal has potential customers for the latest technological businesses including VR in the tourism sector. 27% of respondents replied they were unfamiliar with VR technology (See figure 2) and old-age people have not accessed this survey (see figure 1). The result implies people of Nepal seem capable of adopting the VR technology if they had access to it.

The spending capacity of respondents (NRs) on recreational activities per month

Regarding the query to investigate the monthly expenditure of Nepalese people (in NRs) for recreational purposes, it is visible that around 25% of the total respondent's expenditure was below Rs 500, whereas the monthly expenditure of 22% of the respondents was above NRs 2001. Similarly, around 21%, 9%, and 14% of the respondents replied that their monthly expenditure is between NRs 501 to 1000, 1001 to 1500, and 1501 to 2000, respectively. In this survey, 9% of the respondents choose the option "I do not want to answer". (Average exchange rate: 1 euro = Rs 135)

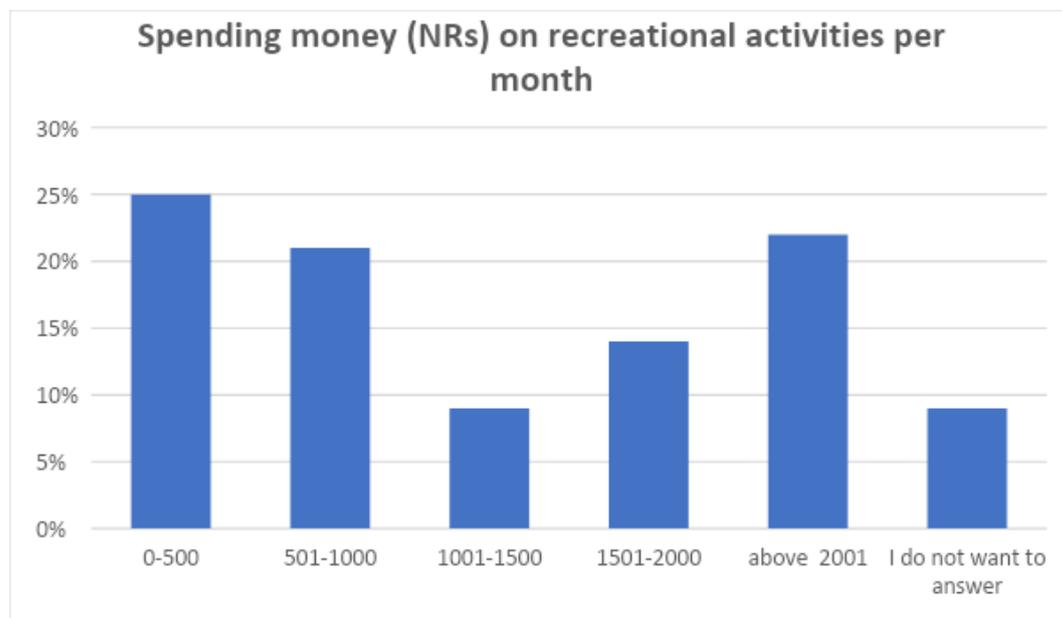


Figure 4. The spending capacity of respondents (NRs) on recreational activities per month

The outcome reflects that similar percentages of respondents are spending minimum (NRs 0-500) and maximum (above NRs 2001) amount for their monthly recreational activities, while other respondents spend between NRs 501 to 2000 monthly. From the above data, it can be considered that the people of Nepal are spending a good amount of money on their recreational activities. This displays that if the VR tourism business is introduced in Nepal, people are likely to spend their money on it.

Frequent travelling trend of respondents for tourism purpose

When it comes to travelling for tourism purposes in Nepal, the response rate of the respondents from the survey (Figure 5) shows that 19% of the respondents are extremely willing to travel, 37% are likely to travel and 25% are moderately likely to travel. Only 14% and 5% of the total respondents are less likely and not at all likely to travel for tourism purposes, respectively.

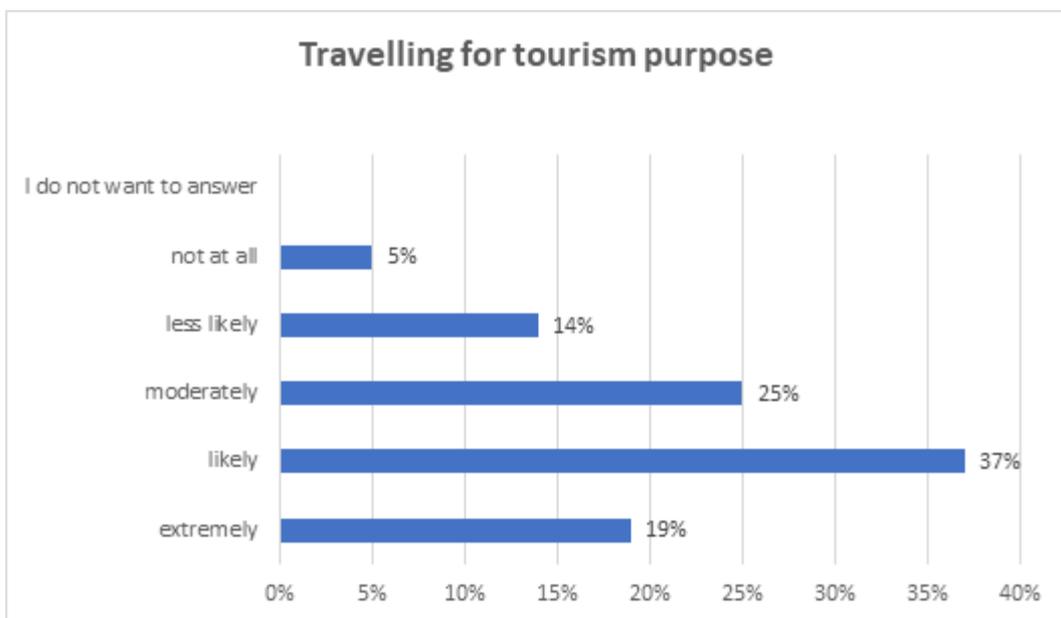


Figure 5. Frequent travelling trend of respondent's

The result illustrates that most Nepalese people are travelling a lot for tourism purposes. But travelling is not always possible and safe because of various constraints, and people cannot always travel for tourism purposes even if they would love to. In this context, if VR technology is introduced for tourism purposes, people who are unable to travel would shift towards VR tourism.

Preference of respondents for Virtual tourism over physical tourism considering physical disability, ageing, time, and geographical constraint

Figure 6 presents the respondent's responses regarding their preference for virtual tourism over physical tourism considering physical disability, ageing, time and geographical constraint. From the survey it was noticed that 14% of respondents would highly prefer virtual tourism over physical tourism, 27% are likely to prefer virtual tourism over physical tourism and 31% are moderately likely to prefer virtual tourism over physical tourism. But 16% and 7% of the total respondents responded that they were less likely to and not at all prefer virtual tourism over physical tourism, respectively. In this survey, 5% of the respondents did not reply to this query.

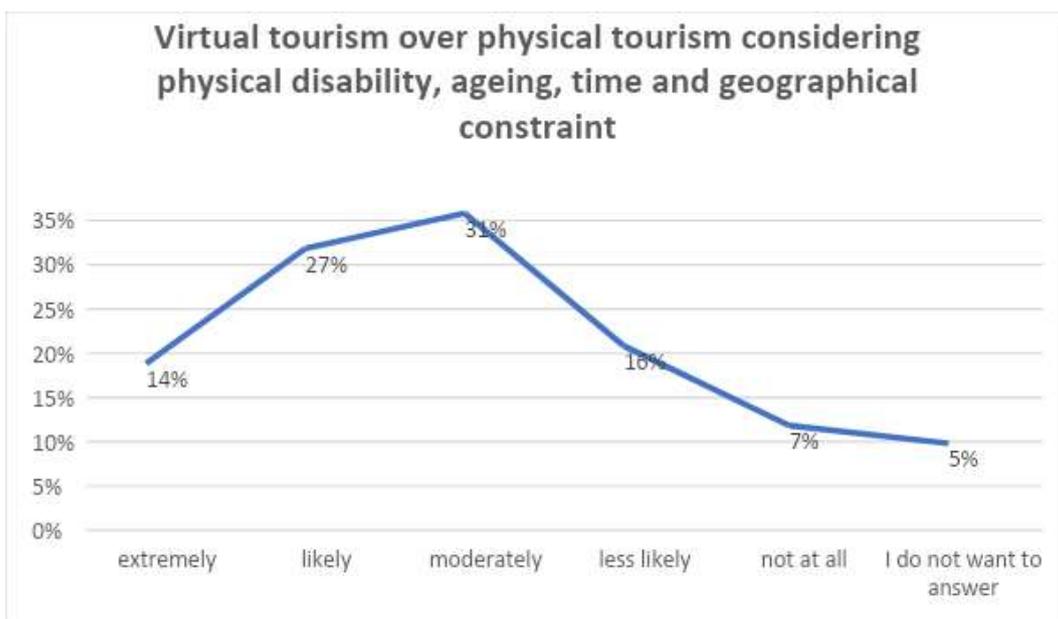


Figure 6. Preferences of respondents on Virtual tourism over physical tourism considering physical disability, ageing, time, and geographical constraint

The above survey exhibits that most of the internal tourists of Nepal prefer virtual tourism over physical tourism during unusual conditions like physical disability, ageing, time, and geographical constraint. However, VR offers the possibility of substitution for physical tourism because VR is very appropriate for physically disabled and ageing people. It

decreases the amount of time; the effort needed and allows users to visit without any geographical constraints.

This survey result reveals that physically disabled internal tourists and aged internal tourists could also be potential customers of VR technologies for virtual tourism in Nepal. Besides, those tourists who have no time for physical tourism due to various reasons are also included.

Preference of respondents for VR tours during uncertainties like COVID-19 and other pandemics

Figure 7 demonstrates the response of respondents regarding the preferences for VR tours during uncertainties like COVID 19 and other similar situations. About 18% of the total respondents responded that they would highly prefer VR tours whereas 11% of respondents responded that they would not prefer VR tours at all during times of uncertainty. Most of the respondents moderately preferred VR tours which were about 26%. Similarly, about 24% said they are likely and about 20% less likely to prefer VR tours during times of uncertainty. In the survey, about 1% of the respondents did not reply to this question.

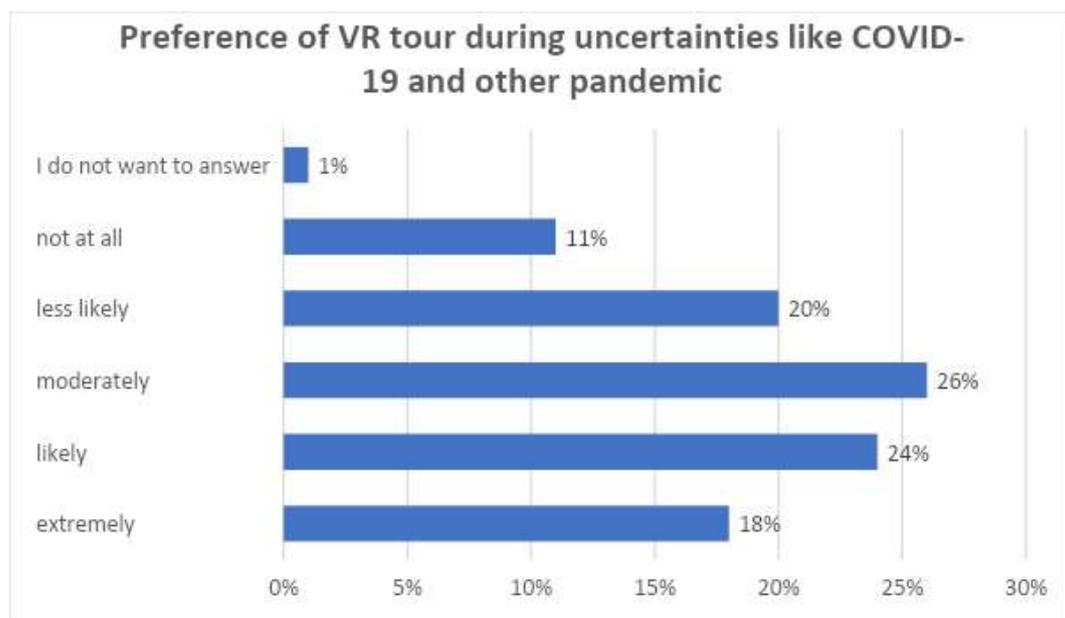


Figure 7. Preference of respondents for VR tours during uncertainties like COVID-19 and other pandemics

The result of the survey illustrates that most people prefer VR tours during times of uncertainty. During COVID-19, the government of Nepal restricted its people to travel from one place to another. There were no other substitutions that could satisfy the desire to travel.

When the above information was arranged together, it was revealed that Nepal has many existing customers who are interested in VR tours, especially during uncertainties like COVID-19 or other pandemics. The existing customers of VR tours indicate that Nepal has a huge market potential for VR in the tourism industry and could be one of the substitutions for physical tourism during times of uncertainty.

Preference of respondents for physical tourism considering the infrastructure of Nepal

Regarding the preference for physical tourism, 31% of the total respondents mentioned that they highly prefer physical tourism, 33% were likely to prefer physical tourism, 28% moderately prefer physical tourism, 7% were less likely to prefer and 1% did not prefer physical tourism at all with consideration to the infrastructure of Nepal. None of the respondents replied that they did not want to answer.

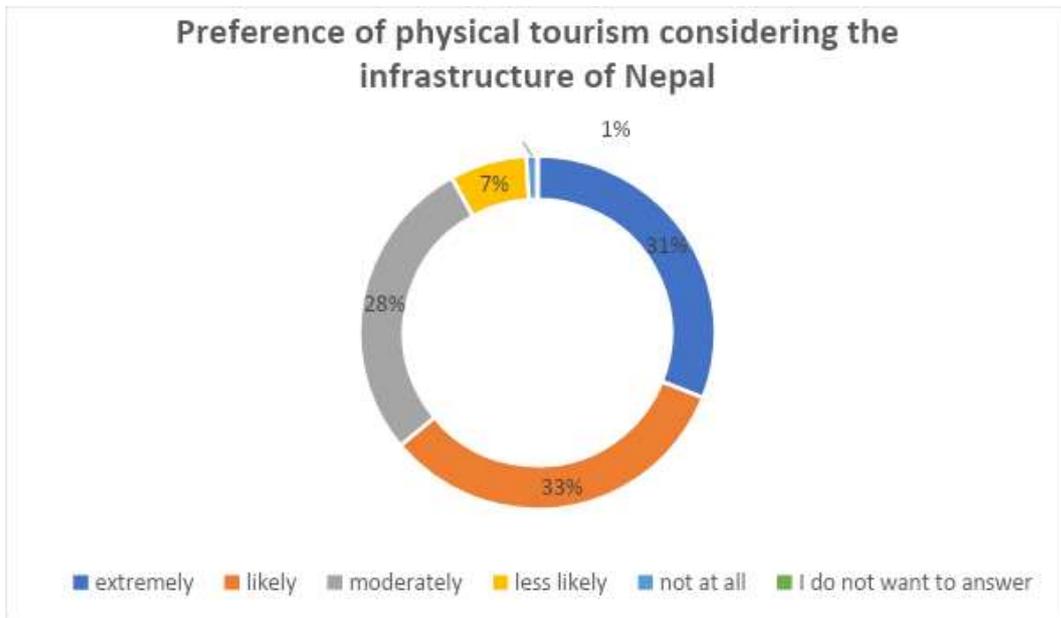


Figure 8. Preference of respondents for physical tourism considering the infrastructure of Nepal

The above figure reveals that even though the infrastructure of Nepal is poor, most of the internal tourists prefer physical tourism considering the infrastructure. Nepal is very famous for rural tourism and trekking activities; the development of modern infrastructure might reduce its authenticity.

From the result, it can be stated that Virtual Reality tourism could be one of the potential options for physical tourism, but it can never occupy or replace the spot of physical tourism in many cases. However, some respondents who do not prefer physical tourism while considering the infrastructure of Nepal could be the possible customer for virtual tourism.

Preference of respondents to visit ancient heritages virtually if it is preserved digitally

Figure 9 denotes the preferences of respondents regarding the virtual visit of ancient heritages if they were preserved digitally. In this survey, about 40% of the respondents stated that if ancient heritages were to be preserved digitally, they would extremely prefer to visit it virtually, whereas 5% responded that they will not visit it virtually at all. About 18% of

the respondents' reply was that they will moderately prefer to visit it virtually. Similarly, 11% said that they are less likely to prefer the virtual visit, whereas 26% of the respondents mentioned that they will visit ancient heritage virtually if it were preserved digitally.

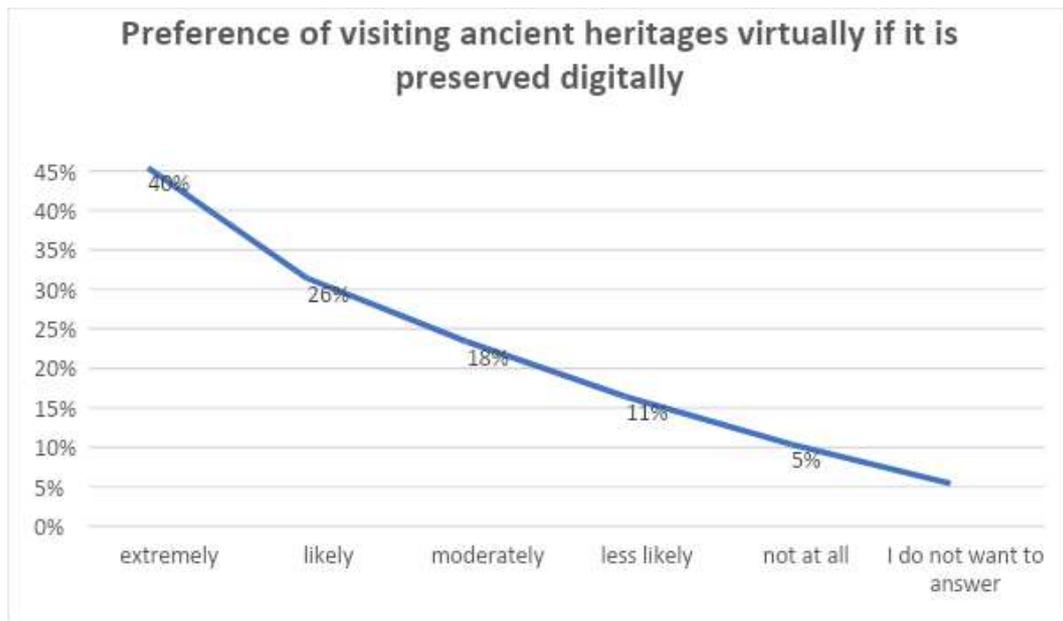


Figure 9. Preference of respondents to visit ancient heritages virtually if it is preserved digitally

The above result suggests that if the ancient heritage would be preserved digitally, a significant number of domestic tourists would visit it virtually. This provides knowledge to the tourist about the ancient culture and the country's history. However, many ancient heritage sites and monuments of Nepal are in poor condition. The government of Nepal has restricted tourists to visit them physically.

From the result, it can be perceived that the opportunities of VR tourism in the context of ancient heritages have a high potential market in Nepal. If the strategy is planned well, both internal and international tourists could be potential customers. The government could sell the VR videos of ancient heritages globally through internet platforms. This helps in the promotion of ancient heritages and generates income.

Opinion of respondents about the integration of VR technology in the tourism industry of Nepal (Open-end question)

Concerning the open-ended was devised with the expectation of understanding the opinions of internal tourists of Nepal regarding the integration of VR technology in the tourism industry of Nepal. 61 participants responded to this query among 107 total respondents so, 46 respondents did not express their views regarding this matter. All the freely written opinions were analyzed and based on the opinions the received information was further divided into 3 separate categories which were classified based on the opinion to be positive, mixed, and negative. The remaining 46 respondents were placed in the “No response” category in the pie chart below.

Out of 61 respondents, 51 respondents expressed that the integration of VR technology in Nepal’s tourism is suitable. Whereas 7 respondents indicated that it is not suitable at all. The remaining 3 respondents have mixed opinions regarding the issue of integration.

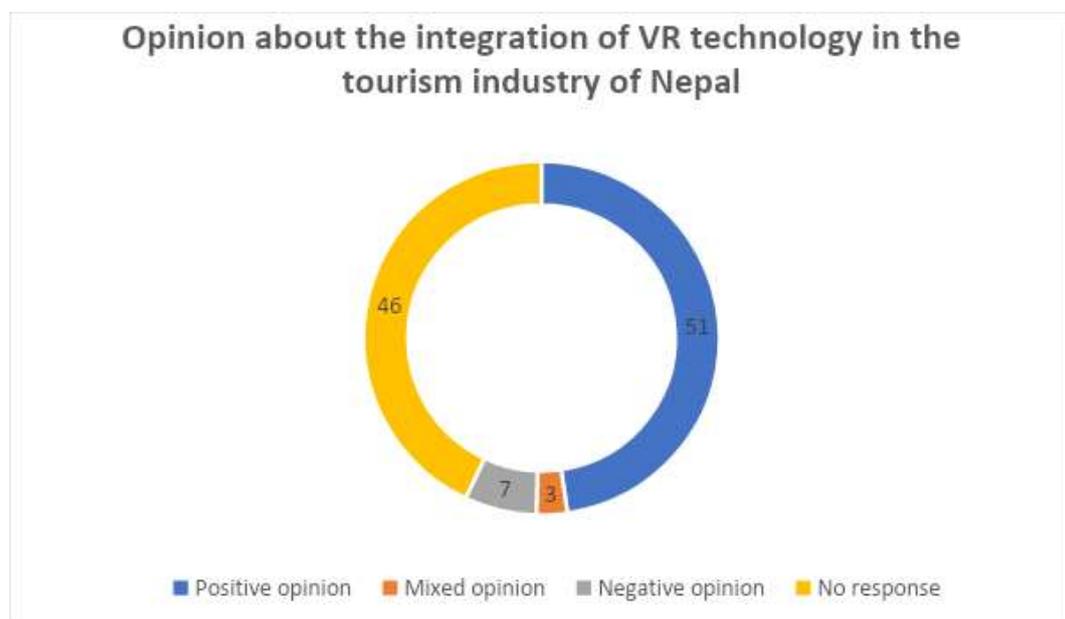


Figure 10. Opinion of respondents about the integration of VR technology in the tourism industry of Nepal

The outcome of the open-ended query demonstrated that the majority of respondents have a positive survey question illustrated that most of the internal tourists have a positive viewpoint in VR tourism opinion about the integration of VR technology in Nepal's tourism sector because physical tourism in Nepal has numerous complications and obstacles. The outcome and viewpoint of the respondents denote the VR application in the tourism industry of Nepal has huge market potential.

4.2 Data analysis and Survey results (Second survey)

The prime objective of this section is to include all the results acquired from the second survey that investigates the ongoing business activities of VR technology in Europe and then analyze the feasibility of VR technology in the tourism industry of Nepal. The following survey questions were sent to the VR related companies in Europe.

1. What is your position in the company?
2. How many years have you worked in the company?
3. How long has your company been in VR related business?
4. How likely is your company's economy to grow?
5. How likely is it that the same customer visits your company repeatedly?
6. How likely is your company affected during the COVID-19 pandemic?
7. What do you think about the future scope of VR related businesses?

In this second survey, out of the 270 contacted VR related business companies from Europe, only 8 companies replied to the survey questionnaires. The response rate was 3% which raises questions about the reliability of the research. The results of each variable from the second part of the research question are discussed below:

Position of respondents in the company

About the position of the respondents in their companies (See figure 11), out of the 8 respondents, 2 of the respondents were directors, 3 were managers, and 2 of the respondents belonged to other positions. In this survey, there were no respondents who hold the position of the administration. Furthermore, 1 of the respondents did not want to answer the survey question.

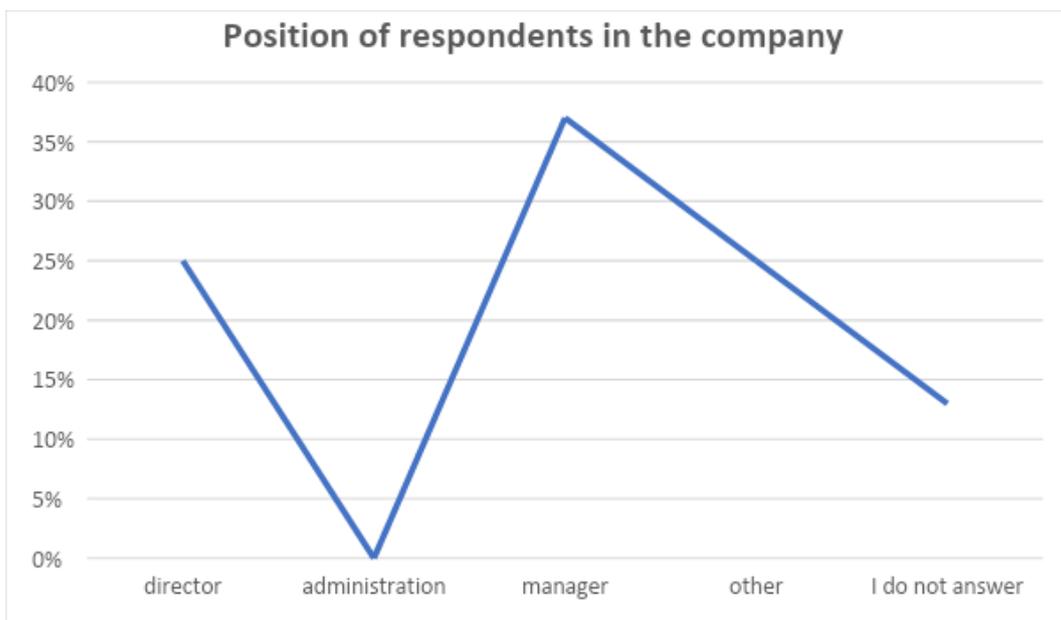


Figure 11. Position of respondents in the company

The outcomes from the survey indicated that most of the respondents hold a higher position in the company. This demonstrates that the information provided by the respondents has higher reliability and can be used for analysing the feasibility of VR in the tourism industry of Nepal.

Working experiences of the respondents in the particular company

The below figure 12 shows the working experiences of the respondents in their respective companies. Out of 8 respondents, 21 respondents have working experience between 1 to 3 years, 3 have working experience of 3 to 5 years, 1 have experience of 5 to 7 years, and 2

have working experiences above 7 years. In this survey, no respondents have working experience between 0 to 1 year and no respondents responded that they did not want to answer this query.

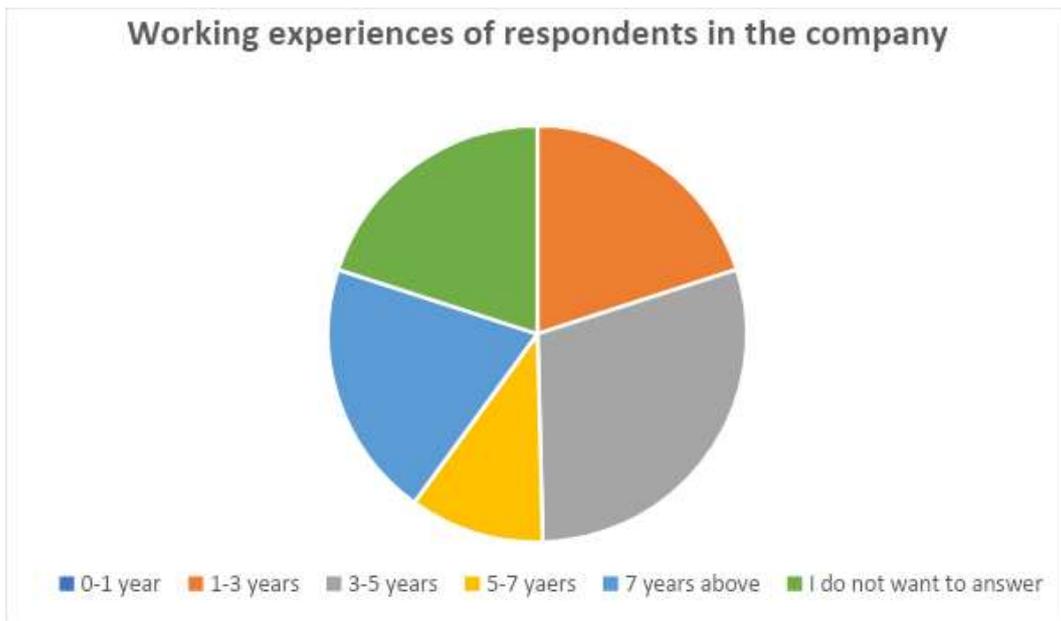


Figure 12. Working experiences of the respondents in the particular company

The above outcome reflects that the majority of the respondents have higher working experience in the respective companies related to the VR business. All the information provided by them can be valuable for analysing the feasibility of VR application in the tourism industry of Nepal.

Experiences of the respondents' company in VR related business

The following figure 13 displays the experience of the companies operating in VR related business in Europe. Out of 8 respondents from different companies, 3 of them are 2-4 years old, 4 companies are 4-6 years old and 1 company is 6-8 years old. There were no companies that were 0-2 years old and above 8 years old. Similarly, none of the respondents replied that they do not want to answer this survey question.

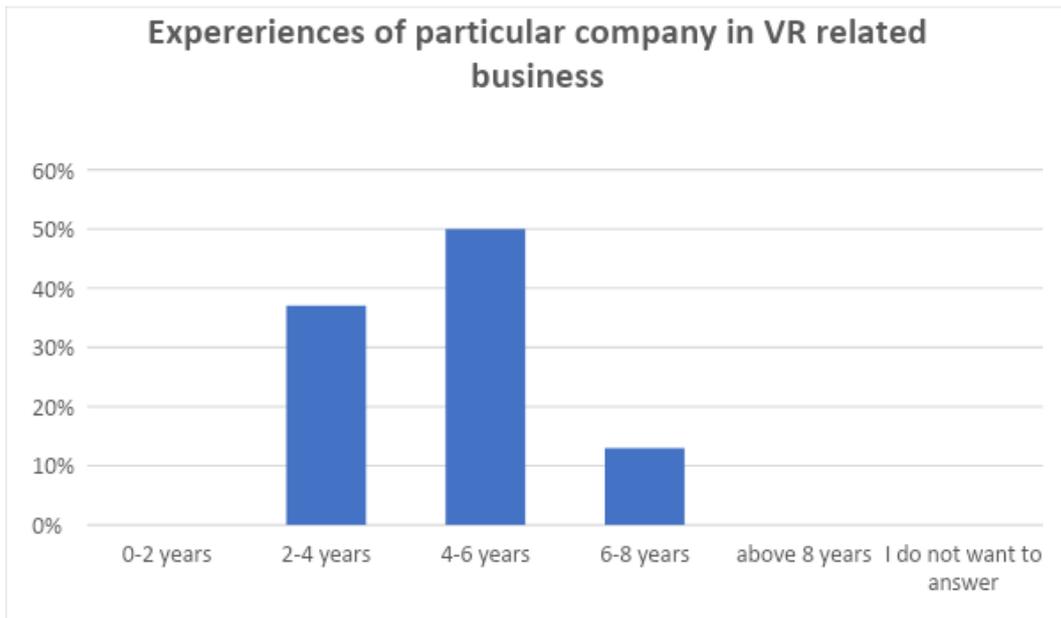


Figure 13. Experiences of the respondents' company in VR related business

The result from this survey question revealed one fact that most of the companies are old enough and still exist in the market, which denotes the companies are doing good business in Europe with VR technology. This indicates that if the VR related business companies in Europe are well existing then the opportunities of VR related business in Nepal are also high as VR is a new evolving technology that is rapidly expanding from innovative countries to all over the world.

The economy of the VR related business companies in Europe

Regarding the economic growth of the VR related business in Europe, the following figure 14 shows that about 2 respondents said that the economy of their company is growing moderately, 5 respondents responded that the economy of their company is likely to grow and 1 responded that the economy of their company is growing extremely fast. None of the respondents responded that the economy of their company is not growing at all or is less likely to grow. All the respondents answered this survey question.

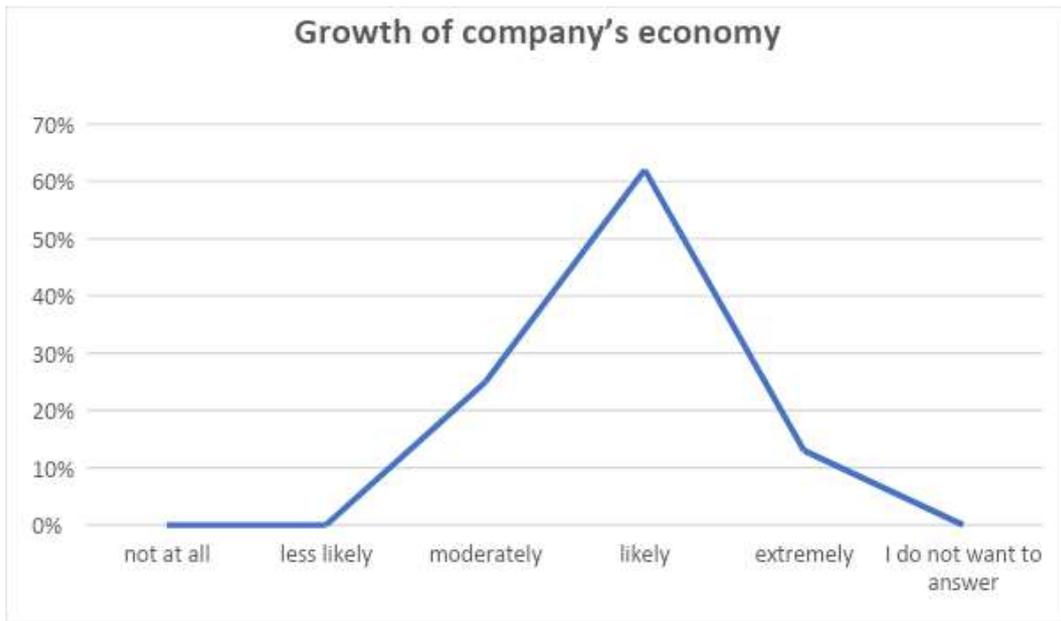


Figure 14. The economy of the VR related business companies in Europe

The findings of the survey disclose that all the respondent companies related to VR businesses in Europe have an increasing economy. The growing economy of the company implies that the customers and the market of VR related businesses in Europe are huge. Since VR is a new and evolving technology, not all countries have businesses that are related to it, yet. This survey result assists to understand the market potential of VR related businesses in other countries and inspires entrepreneurs to start up new VR related businesses in other parts of the world.

Regular customers of the particular VR related business company

Figure 15 reveals the respondent's replies regarding the regular customers of their companies. About 2 of the company's representatives responded that the same customer visits are less likely to their company, 1 of them mentioned that the same customer visit is moderately likely, 1 of the respondents stated it is likely, and 4 respondents replied that the same customers visit their company quite often. None of the respondents' replied that there were no customer visits to their company at all, and every respondent answered survey questions.

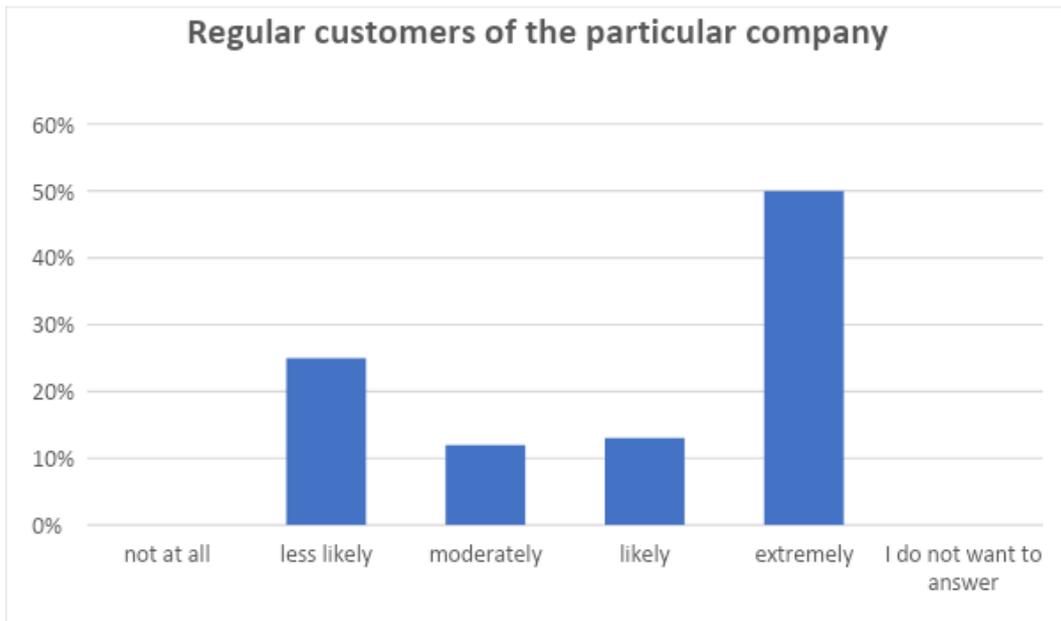


Figure 15. Regular customers of the particular VR related business company

From the above outcome, it can be interpreted that every VR related business company has their own regular customers. In most companies, the flow of the same customers is very high. It shows that customers are very much interested in VR technology for different purposes. This survey outcome helps to understand that if VR technology is used for tourism purposes in Nepal, there is a high possibility of regular visits from customers, even though the marketing about its service might be highly needed to attract the customers at the beginning.

Effect of COVID-19 pandemic on VR related business of the company

Regarding the effect of the COVID-19 pandemic on the VR-related business of the company, respondents were requested to mark on a 5-point Likert scale whether the COVID-19 pandemic affected their business. In response to this survey question, 2 of the total respondents said that their business was very little and moderately affected during the COVID-19 pandemic, 1 replied that it was somewhat affected and 3 responded that their business was extremely affected during the COVID-19 pandemic whereas 2 replied the effect was moderate. None of the respondents' responses was that it was not affected at all, and there were no respondents who did not want to answer the survey questions.

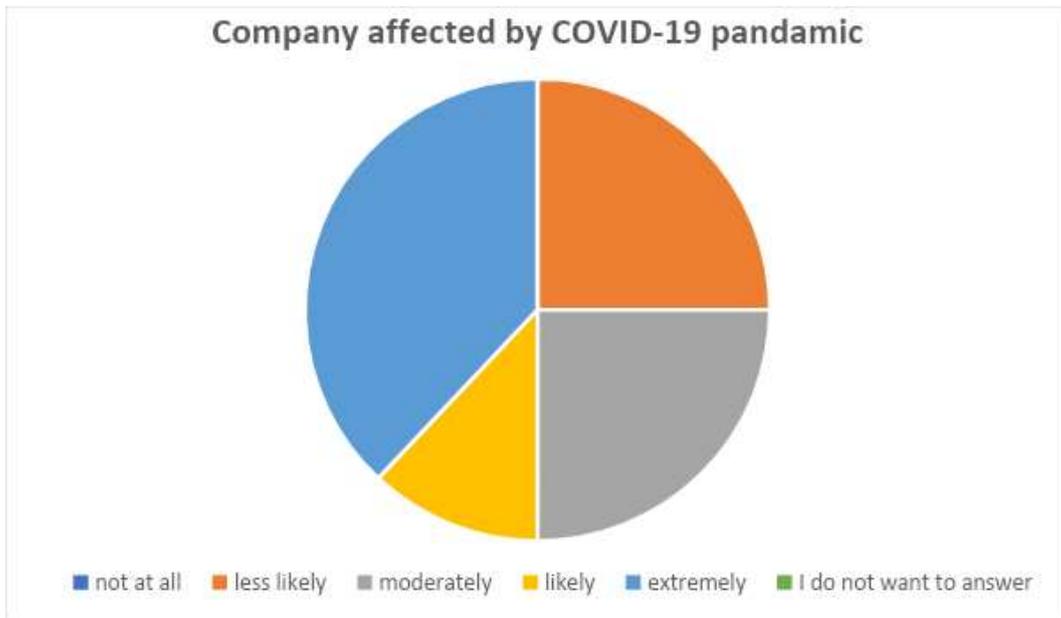


Figure 16. Effect of COVID-19 pandemic on VR related business of the company

From the result, it can be deduced that every VR related business is affected by the COVID-19. This could be due to a lockdown where people were asked to restrict themselves to their homes and all businesses were closed. If the proper safety procedures are applied during such pandemic situations VR related businesses in many sectors have more opportunities for improved performance as people do not need to travel far for tourism, entertainment, recreation, and educational purposes.

Opinion of company representatives about the Future scope of VR related businesses (Open-ended question)

Figure 17 shows the responses of the respondents regarding their opinion about the future scope of VR related businesses. Out of 8 respondents, only 7 replied to this survey question. Based on the opinions of respondents, the received information was then divided into 3 levels which are high scope, medium scope, and low scope. The only respondent who responded to other survey questions but did not respond to this survey question was placed in the 'I do not want to answer' section.

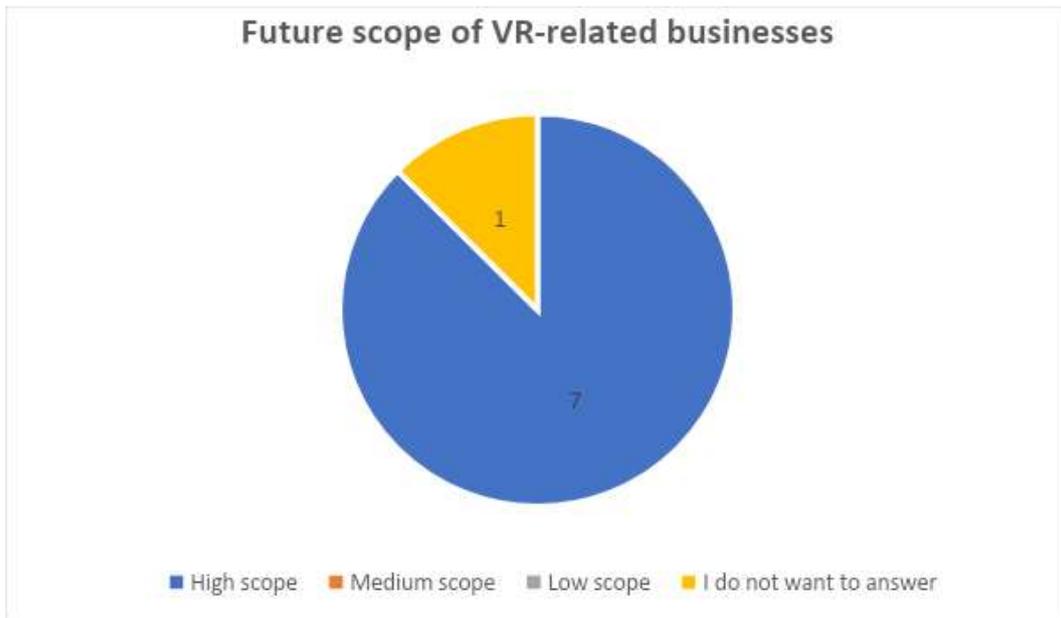


Figure 17. Opinion of company representatives about the Future scope of VR related businesses

From the above figure, it is seen that all 7 respondents who had replied to this survey have responded positively. The objective of this survey was to know the future scope assumption of VR related businesses from the experienced respondents. Every respondent thinks that VR related businesses have huge opportunities and scope in the coming days. As VR is needed for VR tourism and the author is planning to do VR tourism business in Nepal, this result helps to motivate and encourage the implementation of VR technology in the tourism industry of Nepal with the business service centre.

5 Feasibility analysis

A business feasibility study can be defined as a controlled process for identifying problems, determining objectives, defining successful outcomes, assessing the cost range, and other benefits associated with several alternative options for solving the problem (Herald et al. 1995). The study of business feasibility helps an entrepreneur in the decision-making process based on a cost-benefit analysis of their business project (United Nations, 2002). The feasibility study is conducted before finalizing the business plan to check whether the business project is feasible or not (Loan 2010). There are some goals of the business feasibility studies mentioned by Kenton (2020), which are given below:

- To understand all aspects of a project, plan, or concept in a detailed manner.
- To become aware of potential upcoming problems when implementing the project.
- To determine if the project is visible or not, after considering the significant factor.

According to Jebrin (2017), the business feasibility study comes under the roof of environmental analysis of the business projects which helps to identify internal risks as well as external risks of the business.

- Internal risks: The internal risks cover the aspects of yield, cost, technical problems, implementation, and operational difficulties of the business project.
- External risk: The external risks cover the aspect of commercial law, cost of energy, market factor, and inflation (approach to evaluate the business idea in a formal way i.e., showing facts and figures, the viability of an idea, and alternative solutions).

To identify the mission and objective of the organization, strategic management scans the internal environment for weaknesses and strengths, while the external environment is scanned for threats and opportunities. The management team of the organization formulates

different strategic alternatives to achieve their objectives and finally chooses the best one which will be feasible to achieve the objectives. (Field et al. 2006)

In this chapter, the feasibility test of the business idea is conducted to determine whether the business plan of opening a VR tour service centre in Nepal is plausible and worth investing in. Also, it helps in understanding the feasibility of VR in the tourism sector of Nepal. This chapter includes an introduction to the business idea, Mission, Vision, Five forces analysis, Feasibility plan and conclusion of the business idea feasibility analysis.

5.1 Introduction of the Business concept

“VR Tour Centre” is a service providing company that allows tourists to visit their desired tourist places of Nepal virtually. This business concept integrates the existing VR technology and 3D-360 degree tourism videos in one place and serves its customers. This provides opportunities for those tourists who want to visit the tourist places of Nepal physically but cannot do due to various factors like epidemics, economic conditions, pandemics, natural calamities, health conditions, geographical barriers, and other limitations. In addition, this business concept also aims to promote tourism and preserve the ancient monuments and old cultural heritage sites of Nepal digitally.

In the following paragraph below, the author discusses the Mission, Vision and Five Force Analysis of the business idea which was generated to analyze the feasibility of VR technology in Nepal’s tourism.

Mission

Our mission is to bring the core values to the customers by providing the best user experience of VR tourism to the customers of Nepal through our innovative technology.

Vision

The transition of the world can only be brought about with the long-term vision of the companies. Our vision is to make tourism sites of Nepal accessible virtually to every tourist who has problems with physical tourism. Besides this, we also envision seeing Nepal as one of the biggest tourist destinations in the world.

Five Force Analysis

Porter's Five Force Analysis is a strategic tool that was designed to identify the strength, weaknesses, and threats of the competition in the current market as well as the power of our suppliers and buyers.

Threats of New Entrants (Moderate): There is no other similar business yet in the Nepali market which serves the same services as ours. However, there are always uncertainties in business. The new competitor could enter the market with the same business concept. If possible, the patent of the services can be registered for avoiding the new entrants.

Bargaining power of Supplier (Moderate): We need the latest technology (VR devices, simulator and 3D-360 degree tourism videos of Nepal) for providing virtual tourism experiences to our customers. There are many manufacturers and suppliers of VR devices available in the market. Without compromising the quality, we can buy it from one of the suppliers at a possible low cost. Moreover, we also need 3D-360 degree tourism videos of Nepal. For this, we can outsource the experienced 3D-360 degree video making company. Many such companies exist in the market.

Bargaining power of Buyer (High): As our business is a service-related business that requires more interaction with the clients to sell our services. It is therefore vital to maintain a good relationship with our customers. The services provided by our company should satisfy the clients.

Threats of substitution (Moderate): If we are successful in patenting, substitution threats could be reduced. However, technology is evolving and the new technology with different services might replace our business.

Competitive Rivalry (Moderate): There are no direct competitors in the market with a similar business concept yet, but we cannot ignore the future uncertainties. Besides, some companies have started to provide VR gaming services in the Nepali market. Customers who just want to experience the VR world could be the common customer for both companies.

5.2 Feasibility Plan

The feasibility plan consists of four different parts which help to determine whether the VR tour service centre concept is deemed feasible as a business concept. In this research, the author followed the feasibility model that was suggested by Bruce R. Barringer (2009), which includes the four different subtopics of the feasibility plan i.e., Service feasibility, Industry/market feasibility, organizational feasibility, and financial feasibility.

5.2.1 Service Feasibility

The “VR Tour Centre” in Nepal is a concept that integrates existing technology (i.e., VR technology and 3D-360 degree photos/videos of tourist places of Nepal) in one place for providing a realistic feeling of VR tours to the customers and also for promoting the tourism of Nepal. Although these technology and tourism places are well-known and commonly used, a service concept that seeks to integrate these must be tested. Concept statement/test and buying intention survey tools were used to test the service feasibility of “VR Tour Centre”.

Concept Statement/Test

A concept statement/test describes the concept of the “VR Tour Centre” in Nepal that needs to be presented to 10 randomly selected groups of individuals to assess its feasibility. The following concept statement was presented to the random people that took part in the concept statement test:

“VR tour centre” is a service centre where different groups of people can visit the tourist places of Nepal virtually. Physical tourism is not always possible because of pandemics, geographical structure, lack of proper infrastructure, ageing, health conditions, poverty etc. To overcome this problem, the idea of a ‘Virtual tour centre’ in Nepal was generated to provide a platform for those people who want to visit the tourist places of Nepal but cannot do so because of the various problems mentioned above.

The information which has been received from the randomly selected people is summarized below in three categories.

Strengths of the service idea: The suggested service is based on new technologies at an affordable price. All groups of people who are not able to travel physically due to various constraints can visit tourist places in Nepal virtually.

Suggestion for strengthening the idea: Some of the randomly selected people suggest that “VR Tour Centre” should also focus on other services like VR games to generate a secondary revenue stream.

Overall feasibility of the service was assessed as high: About more than 70% of the randomly selected people said that the idea of a “VR Tour Centre” in Nepal is the need of the current times and thought that “VR tour centre” would be a feasible service concept.

Buying Intention

The data from the survey conducted on the internal tourists of Nepal (see Chapter 4.1.1) is used to evaluate their buying intentions for such a service. The survey was distributed to 265 potential customers, out of which 107 responded. The survey questions can be seen in subchapter 4.1.

The analysis of the results for the buying intention shows that most of the internal tourists of Nepal are highly interested in this business idea and are willing to buy the services that “VR Tour Centre” offers. Based on further analysis of the information, we can preliminarily conclude that the service desirability of “VR Tour Centre” is likely to be high among people with a physical disability, high age, time, and geographical constraints.

5.2.2 Industry/Market Feasibility

This part of the feasibility plan examines the feasibility and suitability of the service in the industry and the specific target market. To understand the industry and target market feasibility, three different tools were selected by the author which provides a broad overview of the potential that “VR Tour Centre” in Nepal could have in the industry and that it would become a part of the Nepali tourism market.

First, the Industry Attractiveness Assessment Tool is used to analyse the industry feasibility. Second, the Target Market Attractiveness Assessment Tool is used to assess the target market attractiveness of the “VR Tour Centre” in Nepal. Finally, the Market Timeliness Assessment Tool is used to understand the timeline that the “VR Tour Centre” should follow while entering the market. The industry attractiveness, target market attractiveness and market timeliness are evaluated in tables 3, 4, and 5 respectively.

Table 3. Industry Attractiveness Assessment Tool (Barringer 2009)

	<i>Potential</i>
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<i>Number of competitors</i>	None
<i>Industry age</i>	Young
<i>The growth rate of the industry</i>	High growth
<i>Average net income for firms in the industry</i>	Medium
<i>Degree of industry concentration</i>	Neither concentrated nor fragmented
<i>Industry life cycles stage</i>	Emergence phase
<i>Importance of industry's products and/or services to customers</i>	Would like to have
<i>The extent to which business and environmental trends are moving in favour of the industry</i>	High
<i>Number of exciting new products and services emerging from the industry</i>	High
<i>Long-term prospects</i>	Strong

Table 4. Target Market Attractiveness Assessment Tool (BrockUniversity 2022)

	<i>Potential</i>
<i>Number of competitors in the target market</i>	None
<i>The growth rate of firms in the target market</i>	Rapid growth
<i>Potential to employ low-cost guerrilla and/or buzz marketing techniques to promote the firm's product</i>	High
<i>Methods for generating revenue in the industry</i>	Clear
<i>Ability to create "barriers to entry" for potential customers</i>	Might or might not be able to create

<i>The degree to which customers feel satisfied by the current offerings in the market</i>	Neither satisfied nor dissatisfied
<i>Average net income for firms in the target market</i>	Medium
<i>The excitement surrounding new product offerings in the target market</i>	Medium

Table 5. Market Timeliness Assessment Tool (Barringer 2009)

	<i>Potential</i>
<i>Buying mood of customers</i>	Moderate
<i>The momentum of the market</i>	Moderate
<i>The extent to which business and environmental trends are moving in favour of the target market</i>	High
<i>Need for a new firm in the market with your offerings or geographic location</i>	High
<i>Recent or planned entrance of large firms into the market</i>	Low

From the above self-assessment of industry attractiveness, market attractiveness and market timeliness, it can be concluded that Industry attractiveness seems to be a positive contributor to the concept of the “VR Tour Centre” in Nepal. In Industry attractiveness, 10/10 areas have either moderate or strong potential in the market. In the target market attractiveness, 4/8 of the areas indicate moderate potential and 4/8 of the areas indicate strong potential in the target market. Whereas, in the market timeliness, 5/5 areas are either indicating moderate or high potential. Based on all of these, it seems that “VR Tour Centre” can successfully enter the Nepali tourism Industry. Similarly, the target market seems to be right with its offering. Moreover, the Timeliness of entering the target market also looks suitable for it.

5.2.3 Organizational Feasibility

To understand the industry and target market feasibility of the “VR Tour Centre” in Nepal, the Resource Sufficiency Assessment Tool was selected. This tool provides a broad overview of the organizational resources that the individuals involved in the VR tour Centre need to possess.

Table 6. Resource Sufficiency Assessment Tool (IvyPanda 2019)

<i>Ratings</i>	<i>Resource Sufficiency</i>
<i>2</i>	Office space
<i>1</i>	Space to launch a service business
<i>1</i>	Contract manufacturers or outsourced providers
<i>1</i>	Key management employees
<i>2</i>	Key support personnel
<i>3</i>	Key equipment needed to operate the business
<i>2</i>	Ability to obtain intellectual property protection on key aspects of the business
<i>1 - Available, 2 - Likely to be available: will probably be available and will be within the budget, 3 - Unlikely to be available: will probably be hard to find or gain access to, and may exceed my budget, 4- Unavailable 5. NA: not applicable to my business</i>	
<i>Ratings: Strong, Neutral or Weak</i>	
<i>Weak</i>	Proximity to similar firms
<i>Neutral</i>	Proximity to suppliers
<i>Strong</i>	Proximity to customers
<i>Strong</i>	Proximity to a major research university

The organizational feasibility analysis presented above indicates that the organizational capabilities that the team and individuals that make up the team behind “VR Tour Centre” possess are at a level that might need further development. Management prowess, especially from an entrepreneurial perspective, needs further improvement. Also, the lack of prior industry knowledge could be an issue in the beginning. Otherwise, the future management team seems to be well-equipped for the tasks at hand. From a resource sufficiency perspective, “VR Tour Centre” is in a neutral or strong position, which indicates that needed resources and assets should be readily available.

5.2.4 Financial Feasibility

To understand the financial feasibility of the “VR Tour Centre” concept in Nepal, three tools that assess the financials were selected. Firstly, a simple total start-up cash calculation was created. This illustrates the minimal cash needed to start the business operations. Secondly, the estimated annual sales and net income were calculated which shows that there are notably great expectations for both the sales and net income. Thirdly, a financial attractiveness assessment of the concept was created to assess the feasibility of the “VR Tour Centre” as an investment.

Table 7. Total cash needed for start-up

<i>Operating Expenses</i>	<i>Amount</i>
<i>VR sets (Oculus)</i>	Rs 500,000
<i>Legal, accounting, and professional services</i>	Rs 100,000
<i>Advertising</i>	Rs 50,000
<i>Deposits for utilities</i>	Rs 100,000
<i>Cost of licenses and permits</i>	Rs 10,000
<i>Insurance</i>	Rs 90,000

<i>Rent</i>	Rs 500,000/year
<i>Salary and wages</i>	Rs 600,000
<i>Payroll taxes</i>	Rs 200,000
<i>Travel</i>	Rs 50,000
<i>Signs</i>	-
<i>Tools and supplies</i>	Rs 200,000
<i>Starting inventory</i>	Rs 1,000,000
<i>Cash (working capital)</i>	-
<i>Other</i>	Rs 200,000
<i>Total start-up cash needed</i>	Rs 2,200,000

Table 8. Estimated annual sales and net income (Barringer 2009)

<i>Estimate of Proposed Venture's Annual Sales</i>	<i>Explanation of how the estimate was computed</i>
<i>Estimate of Year 1 Sales:</i> Rs 1,500,000 Below average; Average; Above average	As there are not any existing competitors in the market and since it is a new technology, people might visit for new experiences which will cost them.
<i>Estimate of Year 2 Sales:</i> Rs 3,000,000	When customers experience a VR tour in the first year, the author assumes that many customers will visit the Virtual tour centre again

Below average; Average; Above average	and again because by that time people will understand what the Virtual tour centre is offering and its value.
<i>Estimate of proposed venture's net income</i>	Explanation of how the estimation was computed.
<i>Estimate of year 1 net income:</i> Rs 240,000 Below average; Average; Above average	Net income is calculated by subtracting estimated sales from estimated expenses.
<i>Estimate of year 2 net income:</i> Rs 1,500,000 Below average; Average; Above average	The expenses are estimated to be a bit higher in the second year to facilitate the higher level of sales.

Table 9. Financial Attractiveness Assessment Tool (Barringer 2009)

	<i>Potential</i>
<i>Steady and rapid growth in sales during the first one to three years in a clearly defined target market</i>	Extremely likely

<i>The high percentage of recurring income - meaning that once you win a client, the client will provide recurring sources of revenue</i>	Moderate
<i>The likelihood that internally generated funds will be available within two years to finance growth</i>	Moderately likely
<i>Ability to forecast income and expenses with a reasonable degree of certainty</i>	Moderate
<i>Availability of exit opportunity for the investor if applicable</i>	Likely to be available

Based on the financial feasibility analysis presented above, it could be concluded that the financial feasibility of the “VR Tour Centre” venture would be relatively good. The start-up investment needed is quite small and its payback period would be less than a single year. A rough estimate of the capital needed to start the venture is presented in the Total start-up cash needed review. The attractiveness of the “VR Tour Centre” venture was analysed through the Financial Attractiveness Assessment Tool. Based on the assessment, it would likely be a venture that will generate a growing revenue quickly, which also has a likelihood of having many recurring customers.

5.3 Conclusion of the Business concept

This sub-chapter provides the outcome of the above-presented analysis. In the below table, the result of the feasibility analysis is summarized. In addition, it also provides suggestions for improving the feasibility of the business idea.

Table 10. Conclusion table of Business concept

	<i>Overall Feasibility of the Business</i>	<i>Suggestions for Improving the Feasibility</i>

<i>Service Feasibility</i>	Feasible	The concept of a “VR Tour Centre” in Nepal was deemed feasible.
<i>Industry/Market Feasibility</i>	Feasible	The industry and target market were deemed feasible.
<i>Organizational Feasibility</i>	Unsure	More entrepreneurship experience and industry knowledge are needed.
<i>Financial Feasibility</i>	Feasible	The concept of a “VR Tour Centre” in Nepal is financially feasible on a GENERAL level, but this requires more analysis.
<i>Overall Assessment</i>	Feasible	In general, the concept of the “VR Tour Centre” in Nepal can be considered a feasible start-up venture.

From the table above, it appears that the business concept of opening a “VR Tour Centre” in Nepal is somehow feasible. The feasibility analysis shows that the Service feasibility, Industry feasibility, and financial feasibility of the proposed business idea are feasible. Whereas the organizational feasibility of a business idea seems to be unclear due to the lack of more entrepreneurship experience and industry knowledge needed for implementing the business concept in the targeted market.

6 Discussion and Limitations

Virtual Reality (VR) is often defined as a computer-generated 3D environment, not a new concept that has existed since the 1960s. The advancement in the field of research and development has enabled its applications in all areas of human endeavour. VR applications have been developed for manufacturing, training, education, evaluating design, maintenance tasks, assistance for the handicapped, study and treatment of phobias, entertainment, and much more. The outbreak of COVID-19 has affected all areas of human life, this pandemic is forcing us to look for alternatives to all aspects of life. The use of VR technology in the tourism sector has given rise to a concept called virtual tourism, which empowers the tourist to experience the destination with interactive, detailed, and realistic 3D visualization in a virtual tour.

Nepal as a tourist destination has obtained the attention and international recognition since 1953 as the highest mountain, Mount Everest was conquered. Since then, the tourism industry has evolved by adding different elements to attract more tourists every year. Nepal is one of the best destinations for activities like mountaineering, trekking, and rafting. With the ambition to diversify the activities available for tourists and to modernize the industry, newer forms of adventure sport are being identified. A recent addition to activities includes skydiving, bungee jumping, zip flying, and ultralight flying. VR tourism in Nepal is a relatively newer concept that appears attractive and rewarding.

The primary purpose of the study was to investigate the prospects of VR tourism in Nepal and to examine its feasibility as a business. The author devises single research questions with its sub-questions to acquire a comprehensive view of VR tourism in the context of Nepal. The first part of the research question “Is VR technology feasible in the Nepalese context for developing VR tourism as a business?” aims to evaluate the characteristics considered necessary for the adoption of new technology. To obtain the information regarding the factors that are crucial for the adoption of VR a survey was conducted. The survey questionnaire included 10 queries which were created to know the basic information about

the respondents, their background, openness towards trying new technology, their view on the usefulness of VR during uncertain times, and their response to VR tourism. The respondent's response rate was 41% which ensured the reliability of the survey. As a result of the data that was analyzed, it is fair to state that VR technology has an encouraging potential in the Nepalese market. Most of the respondents on the survey are youths who seem curious about the technology that is open to trying out VR. Although COVID-19 restriction is slowly and carefully rising and people are looking for ways to come back to life as before the pandemic, it only seems logical to look for alternative ways for all the activities.

The second part of the research question is "what is the trend and activities of VR technology in Europe?" intends to understand the prospect of VR technology and business. The main motivation for choosing the European market and business for benchmarking is due to the fact that European countries are praised for research and development in technologies and are among the innovation leaders. To understand the European landscape for VR technology and business, a second survey containing 7 queries was created. The survey queries intended to inquire about the company's experience in the VR business, their customer's preferences, the pandemics' effect on business, and the future of the industry. The position of the representative responding to the survey was requested to validate if they are experienced enough and could make the right assessment about the business. The respondent's rate was only 3%, so literature on VR business in Europe was studied. Though the respondent rate was low, the tendency of the survey report and the literature reflected similarities in the projection regarding the growth. After analyzing the data available, along with the literature study it is unbiased to state that VR technology beholds enormous potential in Europe. Many industries are searching for opportunities to include VR technologies in their business as the market size and value is growing exponentially. The implementation of VR technology opens a newer dimension for many activities compared to traditional views.

The outcome of the research questions gave a comprehensive illustration of the business landscape. The review of the survey's outcome was optimistic and encouraging which validated that VR tourism in Nepal has promising growth. After the analysis of survey findings and the solution to the research question, the author decides to check the feasibility

of VR tourism in Nepal. The primary objective of the feasibility analysis was to identify problems and risks in the business, establish objectives, and expected outcomes for its success, evaluating cost and other benefits incorporated with the alternatives. The results of tools like service feasibility, market attractiveness assessment tool, organizational sufficiency assessment tool, and financial attractive assessment tool were evaluated. All assessments except the organizational sufficiency assessment tool, all others reflect that “VR Tour Centre” was a feasible business concept. The author's lack of experience with entrepreneurship and detailed knowledge of the industry was the cause behind unclear reflection on the concept. The author could address the concern by increasing the know-how of the industry and acquiring experience in the industry before establishing a VR Tour Centre.

Limitations of the research

As the research questions were more qualitative by nature, most of the study of this research was designed qualitatively. The research was built on inductive reasoning as there are no absolute means to compute its reliability. Even though 41percent of respondents acknowledged the query, the non-respondents 59% were the majority and their view on the subject might be different from the respondents. Therefore, there is still room for a different outcome that is unknown. The second survey had 3% respondents, so the author identifies literature that addressed the second research question and continues to interpret the data considering the literature as the basis or foundation for discussion. Without knowing the real response of approached respondents, the result stated might not be completely accurate. The other influencing factor might be the selection of literature that corresponds to the concept of VR technology from the business point of view rather than the technological viewpoint.

7 Conclusion and Recommendation

The objective of the thesis was to gather information regarding VR technology and evaluate whether potential customers of VR in Nepal would prefer this new technology that has the potential to drastically change the dimension of tourism by merging VR in the Nepalese tourism sector. Additionally, the European market and its projected growth, business functioning, and customer management were examined to determine the opportunities and risks associated with the VR business. The feasibility analysis was necessary to evaluate if the VR business is workable in Nepal.

Virtual Reality as a technology has the game-changing quality that all industries are trying to incorporate into their business portfolio. The tourism industry can be heavily benefited from VR technology as it opens a newer dimension of travelling. Technological advancement, research and development, advancement in material science, and its availability and ease of manufacturing have lowered the price for VR making its adoption and implementation possible. Nepal as a tourism destination could be an actor in the adoption and implementation of VR technology in the tourism industry. The survey reflects the curiosity and desire of potential customers of “VR Tour Centre” towards VR and its fusion with the tourism industry of Nepal.

Recommendation for future work:

VR technology consists of many research possibilities that could be done with a focus on any particular industry. Many sectors are trying to incorporate VR technology and benefit from it. The recommendations mentioned below are the outcome of the literature review and the limitations of this study.

- Research that deepens the study in development and applications
- Customer's perspective on physical and virtual tourism
- The study includes VR only, AR could provide more interactive solutions

- Proper planning of survey timing is required. In this research, there were fewer respondents in the 2nd survey due to COVID-19 and its lockdown.

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Appendix 1. Survey questionnaire for the first survey



Survey on Feasibility of Virtual Reality Tourism in Context to Nepal

The tourism industry has been a pioneer in the economic development of Nepal. Over the period, the tourism industry has been pushed hard by various factors like natural calamities, pandemics, political issues etc. Adopting new trends in technology has been utterly important in handling these factors. We ask you to spend 5-8 minutes of your valuable time to answer this survey.

Note: In the following survey, if you do not want to answer a question or questions, please do select " I do not want to answer".

1. Which age group do you belong to?

- 18 - 25
- 26 - 33
- 34 - 40
- 41 - 47
- 48 above

2. Are you familiar with Virtual Reality (VR) technology?

- yes
 - no
 - I do not want to answer
-

3. How likely do you adopt new technology?

- not at all
- less likely
- moderately
- likely
- extremely
- I do not want to answer

4. How much (NRs) do you spend on your recreational activities per month?

- 0 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 2000
- 2001 above
- I do not want to answer

5. How likely do you travel for tourism purposes?

- not at all
- less likely
- moderately
- likely
- extremely
- I do not want to answer

6. How likely do you prefer virtual tourism over physical tourism considering physical disability, ageing, time and geographical constraint?

- not at all
- less likely
- moderately
- likely
- extremely
- I do not want to answer

7. Considering the infrastructure of Nepal, how likely do you prefer physical tourism?

- not at all
- less likely
- moderately
- likely
- extremely
- I do not want to answer

8. How likely do you prefer VR tour during the uncertainties like COVID-19 pandemics?

- not at all
- less likely
- moderately
- likely
- extremely
- I do not want to answer

9. If ancient heritages of Nepal will be preserved digitally, how likely do you prefer to visit it virtually?

-
- not at all
 - less likely
 - moderately
 - likely
 - extremely
 - I do not want to answer
-

10. How suitable it would be to integrate VR technology in the Tourism industry of Nepal?

Appendix 2. Survey questionnaire for the first survey

Survey Research on VR related businesses of European countries to check the feasibility of VR tourism business in Nepal

1. What is your position in the company?

- director
- administration
- manager
- other
- I do not want to answer

2. How many years you have worked in the company?

- 0-1 year
- 1-3 years
- 1-5 years
- 5-7 years
- 7 years above
- I do not want to answer

3. How long has your company been in VR related business?

- 0-2 years
 - 2-4 years
 - 4-6 years
 - 6-8 years
 - above 8 years
 - I do not want to answer
-

4. How likely your company's economy is growing?

- not at all
- less likely
- moderately
- likely
- extremely
- I do not want to answer

5. How likely the same customer visits your company?

- not at all
- less likely
- moderately
- likely
- extremely
- I do not want to answer

6. How likely is your company affected during the COVID-19 pandemic?

- not at all
- less likely
- moderately
- likely
- extremely
- I do not want to answer

7. What you think about the future scope of VR related businesses?

