Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Information Technology

Master's Thesis

Web-based information system for tourists in Nepal

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Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

Basanta Bhujel

Informatics

Thesis title

Web-based information system for tourists in Nepal

Objectives of thesis

The objective of the thesis is to design, implement and develop a user-centered design web-based information system based on real user needs on the various services in Nepal that can provide reliable and up-to-date information about the country's attractions, services, and safety measures and evaluate the benefits of the newly designed system with existing systems. To achieve this, the following objectives will be pursued:
1) Gather user's needs and preferences before development of the system and verify user's level of satisfaction after development.
2) Utilize UML representations to display the relationship and interactions between various elements.
3) Use UML and wireframes to design a prototype for proper planning, analysis, and implementation of the system before writing the actual code.
4) Compare the new system with existing systems to demonstrate it's potential benefits in technical and economical perspective.

Methodology

To accomplish these objectives, the following methodology will be employed:

1) Conduct a comprehensive literature review of the technologies and methods used in the practical part of the thesis.

2) Collect primary data using a survey tool with open-ended and close-ended questionnaires to gather user's needs and preferences.

3) Use a sampling method to select respondents of the questionnaires and measure user's level of satisfaction using a Likert scale.

4) Use a web-site CMS framework to design the User Interface and other required features regarding the Software Development Life Cycle(SDLC).

5) Use UML and wireframes to design the prototype of an application that shows the relationship between the different elements in the system.

6) Use proper analytical methods to compare the new system with existing systems to demonstrate it's potential benefits in technical and economical perspective.

The proposed extent of the thesis

60 – 80 pages

Keywords

User-centered design, UML, Object-oriented Design, Nepal Tourism, System Analysis and Design, Web Application,Content Management System

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Declaration

I affirm that I have independently completed my master's thesis entitled "**Web-based information system for tourists in Nepal**" and have exclusively utilized the references listed in the thesis. As the author of the master's thesis, I confirm that it is in compliance with all copyright regulations.

In Prague on 15.03.2024

Basanta Bhujel

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I would like to express my sincere gratitude to Ing. Petr Benda, Ph.D, the esteemed individual who served as my thesis advisor, for their invaluable guidance, unwavering assistance, and insightful critique throughout the research process. The knowledge and expertise possessed by these individuals have played a pivotal role in shaping the direction and quality of this thesis.

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Web-based information system for tourists in Nepal

Abstract

Tourism in Nepal stands as a cornerstone of its economy, attracting visitors from around the globe with its diverse landscapes, rich cultural heritage, and unparalleled adventure opportunities. However, amidst the rapid advancement of technology, the tourism sector faces the challenge of adapting to changing traveler expectations and preferences. Web-based information systems have emerged as a vital tool in this endeavor, reshaping the way tourists seek and experience destinations. Despite this, existing systems often fall short of meeting the unique needs of travelers in Nepal. This thesis endeavors to bridge this gap by proposing a user-centered web-based information system tailored specifically to the needs of tourists in Nepal.

Through a multifaceted approach encompassing comprehensive literature review, meticulous user surveys, UML prototyping, and rigorous statistical analysis, the research aims to elevate the overall tourist experience, foster sustainable tourism practices, and bolster Nepal's position as a premier travel destination on the global stage. ANOVA, Regression, and Descriptive analysis are statistical techniques that are used to find important factors that contribute to the information system's effectiveness. The findings from this study shed light on the significant improvements in user satisfaction achieved through the proposed UI designs, underscoring the transformative potential of technology in Nepal's tourism industry.

The purpose of this thesis is to shed light on how essential a web-based information system is to meeting the needs of visitors to Nepal. The knowledge gained from this research can direct the creation and application of efficient plans for using technology to improve visitors' overall experience and engagement, which will support the long-term expansion of Nepal's tourism industry.

Keywords: Tourist, Tourism industry, Web based information system, User-centered design, UML prototyping, UI designs, User experience, Technology in tourism

Webový informační systém pro turisty v Nepálu

Abstraktní

Cestovní ruch v Nepálu je základním kamenem jeho ekonomiky a přitahuje návštěvníky z celého světa svou rozmanitou krajinou, bohatým kulturním dědictvím a jedinečnými příležitostmi pro dobrodružství. Uprostřed rychlého pokroku technologií však odvětví cestovního ruchu čelí výzvě přizpůsobit se měnícím se očekáváním a preferencím cestovatelů. Webové informační systémy se v tomto úsilí ukázaly jako zásadní nástroj, který mění způsob, jakým turisté vyhledávají a prožívají destinace. Navzdory tomu stávající systémy často nesplňují jedinečné potřeby cestujících v Nepálu. Tato práce se snaží tuto propast překlenout tím, že navrhuje webový informační systém zaměřený na uživatele, šitý na míru potřebám turistů v Nepálu.

Prostřednictvím mnohostranného přístupu zahrnujícího komplexní přehled literatury, pečlivé uživatelské průzkumy, prototypování UML a přísnou statistickou analýzu si výzkum klade za cíl pozvednout celkový turistický zážitek, podporovat praktiky udržitelného cestovního ruchu a posílit pozici Nepálu jako přední cestovní destinace na celosvětové scéně. ANOVA, regrese a deskriptivní analýza jsou statistické techniky, které se používají k nalezení důležitých faktorů přispívajících k efektivitě informačního systému. Zjištění z této studie vrhají světlo na významná zlepšení spokojenosti uživatelů dosažená prostřednictvím navrhovaných návrhů uživatelského rozhraní a podtrhují transformační potenciál technologií v nepálském turistickém průmyslu.

Cílem této práce je osvětlit, jak zásadní je webový informační systém pro uspokojení potřeb návštěvníků Nepálu. Poznatky získané z tohoto výzkumu mohou nasměrovat tvorbu a aplikaci efektivních plánů pro využití technologií ke zlepšení celkové zkušenosti a angažovanosti návštěvníků, což podpoří dlouhodobou expanzi nepálského turistického průmyslu.

Klíčová slova: uristika, Cestovní ruch, Webový informační systém, Design zaměřený na uživatele, Prototypování UML, Návrhy uživatelského rozhraní, Uživatelská zkušenost, Technologie v cestovním ruchu

Table of Contents

1. Introduction

Tourism, a dynamic industry, has undergone significant transformation with the integration of technology. In recent years, the confluence of tourism and technology has reshaped the way travelers seek and experience destinations. Particularly, the emergence of web-based information systems has played a pivotal role in facilitating seamless and personalized travel experiences.

As a socioeconomic phenomenon, tourism has developed to become one of the world's largest and fastest-growing industries. There is nothing like the multiplier effect of tourism when it comes to generating employment and dispersing money. It adds a significant amount of value in terms of producing hard foreign cash. Its development throughout developing countries would offer a natural channel for massive resource transfers from rich to emerging nations' economies. It's noteworthy to notice that compared to international trade, the growth route for tourism has been more constant. (Shrestha et al., 2021)

Cradled in the breath-taking Himalayas, Nepal is a popular travel destination for explorers, spiritual seekers, and culture vultures. From the towering peaks of the Everest region to the bustling streets of Kathmandu, Nepal offers a diverse array of experiences for visitors to explore and savor. In Nepal as well, tourism has become an essential component of the country's attempts to enhance foreign currency revenues, bring in foreign investment, develop competitive efficiency, and take other activities to secure Nepal's respectable standing in the world in the twenty-first century. However, navigating the vast landscape of attractions, services, and safety measures in a foreign environment can pose challenges for tourists.

By harnessing the power of technology to deliver reliable and timely information about the country's attractions, services, and safety measures, such a system holds the promise of enhancing the overall tourist experience and promoting sustainable tourism practices. This thesis endeavors to address this gap by proposing the design, implementation, and evaluation of a comprehensive web-based information system for tourists in Nepal.

2. Objectives and Methodology

2.1 Objectives

The objective of the thesis is to propose a user-centered design for web-based information system based on real user needs on the various services in Nepal that can provide reliable and up-to-date information about the country's attractions, services, and safety measures and evaluate the benefits of the newly designed system with existing systems. To achieve this, the following objectives has been pursued:

- Gather user's needs and preferences before development of the system and verify user's level of satisfaction after development.
- Utilize UML representations to display the relationship and interactions between various elements.
- Use UML and wireframes to design a prototype for proper planning, analysis, and implementation of the system before writing the actual code.
- Compare the new system with existing systems to demonstrate it's potential benefits in technical and economical perspective.

2.2 Methodology

To accomplish these objectives, the following methodologies has been employed:

- Conduct a comprehensive literature review of the technologies and methods used in the practical part of the thesis.
- Collect primary data using a survey tool with open-ended and close-ended questionnaires to gather user’s needs and preferences.
- Use a sampling method to select respondents of the questionnaires and measure user’s level of satisfaction using a Likert scale.
- Use UML and wireframes to design the prototype of an application that shows the relationship between the different elements in the system.
- Use proper analytical methods to compare the new system with existing systems to demonstrate it's potential benefits in technical and economical perspective.

3. Literature review

3.1 Introduction

The following chapter has been developed with the consideration of reviewing literature with reference to the current issue under discussion for the following research. The key purpose of the research includes considerations regarding the analysis of Web-based information system for tourists in Nepal. The literature studies in relation to communal marketing, social media presence, and their respective influences on the contextual structure of web-based information system for tourists in Nepal. There are multiple orientations that have been followed with the current structure, with which the main follow-up has been carried out with reference to the aligned literature from the respective studies. In that possibility, comprehensive knowledge has been collected with regards to WBIS and its respective possibilities with respect to the consideration of consumer engagement, respectively.

There are multiple orientations that have been developed under the headings of the current literature review in which the understanding has been carried out with WBIS. The general and comprehensive details have been respectively related to the consideration of maintained specifications within which the main approach has been related to the structural review for web-based information system for tourists in Nepal and its respective relationship with the existence of tourists in Nepal and the aligned consumer attraction. The consumer attraction has further been related to two different outcomes, consumer engagement and consumer loyalty, which further provides the respective orientation regarding how the different factors in relation to literature findings impact consumer engagement and loyalty, respectively.

Apart from the rising curiosity about people from other countries, the main factors contributing to the massive expansion of tourism have been the influence of persons from the industrialized west, an increase in free time, and advances in transportation technology. Often referred to as the "migration of nations in the 20th century," travel has increased dramatically in many countries. As several nations move away from industrial leisure, their populations' desire to travel and experience new things has

grown. The growth potential of this sector hasn't been fully investigated or used, nevertheless. There are many signs that the tourist industry is going to prosper in the twenty-first century.(Mergel, 2012)

For a number of reasons, tourism has expanded and flourished since World War II. The way people live have changed significantly as a result of changes in employment, leisure, finances, and lifestyle patterns in response to societal changes. During this time, there has also been a revolution in communications, encompassing information technology and transportation. A substantial service industry has emerged in response to the growing demand from travelers. This rapid growth in demand for professional holding consultants created the opportunity to launch a business. After World War II, a large number of transport aircraft were available in North America and Europe, where they were quickly acquired at low cost by companies hoping to resurrect their travel sector. Over the past 50 years, living conditions have drastically changed throughout the world. Due to their progress, citizens of these countries now possess greater disposable income. In addition, as life expectancy rose, people in the developed world could enjoy decades of freedom from familial responsibilities after their kids had grown up. Early retirement and state and personal pensions have freed up time and money so that members of this generation can travel more. Technological developments in transportation have made the tourism sector prosperous.(Easton & Wise, 2015)

Nepal forms the very watershed of Asia, land locked between India and China, it spans terrain from subtropical jungle to the icy Himalayas, and contains eight of the world’s ten highest mountains. Its cultural landscape is every bit as diverse: dozens of ethnic groups, speaking as many as fifty dialects coexist in this narrow, jumbled buffer state while two of the world’s great religions. Hinduism and Buddhism overlap and mingle with older tribal traditions-yet it is testimony to the Nepal’s tolerance and good humor that there is no tradition of ethnic or religious strife.(Tan, 2021)

Travel has always captivated humans; this fascination dates back thousands of years. The want to see new places, have new experiences, and discover new things has always compelled humanity to travel. Apart from going to and from work, moving, and making pilgrimages. The 20th century marks the official beginning of a new era for

international tourism. However, the concept of modern tourism as we know it today is rather recent, having emerged just in the last five or six decades.(Bhatia, 2003)

Village tourism is a phenomenon that revolves around the river, sun, rural house, environment, and society. It represents exploration, learning, preservation, and above all the benefit of nature and adventure for the local populace. The goal of village tourism is to help guests choose tours, arrange their trips, and minimize their impact on the environment. The village tourist industry is a balanced, well-run enterprise. Its reach is rather extensive. All parties partake in the advantages in accordance with an equitable allocation plan. When it comes to rural tourism, people always see the villagers as better humans living in unique situations rather than as animals. Above all, the sociocultural environment, economic expansion, and innovative technology transfers are important components of Nepal tourism. Traveling to Nepal is the best form of tourism. (Emmanuel, 2021)

The creation of employment, income, and industry by tourists propels the rural economy in Nepal, where it is the main engine of economic growth. Actually, one of the best strategies for lowering unemployment and poverty in Nepal is tourism. Ever since the country first opened its doors in the 1950s, tourism in Nepal has grown at a steady rate of 10 to 12 percent each year. Activities offered by the tourist industry include climbing as well as religious, cultural, and ecological travel. Despite the country's rich biodiversity, Nepal has not been able to generate enough tourists to access all of the remote areas.(Gaudel, 2020)

Approximately 88% of Nepal's total land area is made up of rural areas. Travel to Nepal thereby promotes the development of the tourism industry. Most notably, tourism has been one of the main foundations supporting the Nepalese economy. In terms of both tourist arrivals and foreign exchange earnings from tourism, Nepal is rated sixth in South Asia.(Chaulaghain, 2013)

The tourist website is one of the main components of ICT that helps travelers make decisions about their trips. With an underdeveloped economy, Nepal is a developing nation in South East Asia. The country has major economic and commercial

barriers as a result of being landlocked, and it mostly depends on China and India, its two biggest neighbors, to facilitate commerce. Agriculture accounts for 31.7% of GDP and employs 65% of the labor force, making it the primary economic activity. Tourism contributes 7.5% of GDP, whilst remittances make up 9.1%. One of the most major businesses in Nepal, tourism provides value in a number of ways and makes a substantial contribution to the nation's overall economic development. In 2018, statistics from the Economic Impact Research showed that 177 billion NRS of Nepal's GDP came from tourism. It is projected to rise by 4.3 percent annually and culminate in NRS 287.6 billion (8.3%) of GDP by 2027. This is essential for the growth and stability of the Nepalese economy, as the figure shows.(Kunwar, 2003)

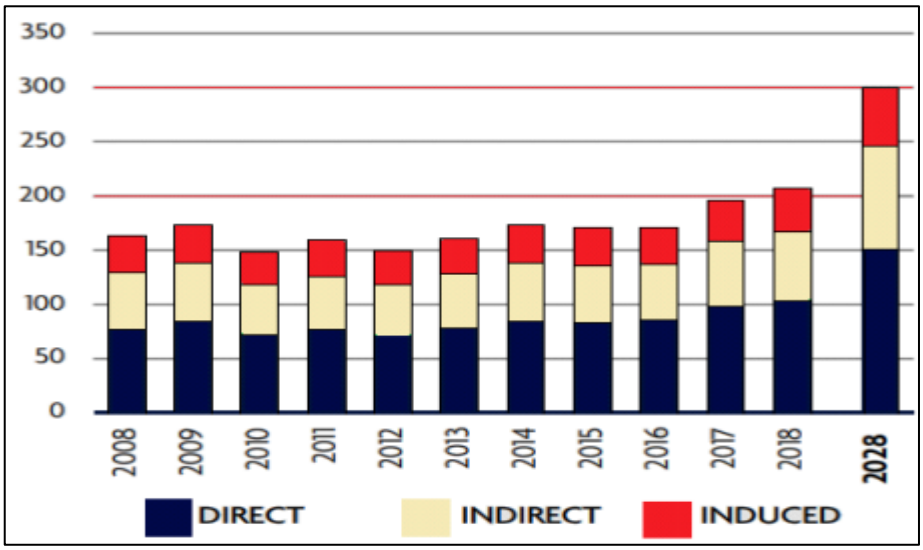


Figure 1: Travel & Tourism contribution to GDP of Nepal
(Source: WTTC report 2018)

Websites are great places to get the information tourists need to make decisions about their trip locations. These days, websites act as data repositories for information on goods and services related to travel. A thorough and attractive website is necessary for marketing, research, and data gathering for both travelers and travel firms. Travel websites must thus be created with user needs and a user-centric design strategy in mind. Through surveys and a review of the literature, this research investigates user needs and perspectives in order to provide suggestions, advice, and design concepts for successful travel websites.(Jeong, 2021)

The tourist industry in Nepal is vital to the national economy since it creates employment for its people. Strong tourism may provide doors for related sectors to grow and prosper as well as create employment of all sizes. The World Travel and Tourism Council lists information and communication technology as being crucial to promoting and assisting the development of the travel and tourism industry. As soon as the Nepali government recognized this, it launched a variety of initiatives and programs targeted at developing and upgrading the travel and tourism sector. Among the projects are those to promote Nepal 2020, conserve cultural treasures both domestically and internationally, digitize the travel industry, and more. A lot of work has already been done in this area, and the government has asked the public for ideas, proposals, and constructive criticism to improve the tourist industry.

ICT is seen as essential at this stage of development, and the travel industry is launching many technological initiatives. These initiatives involve, among other pertinent activities, creating websites for the tourism business, constructing tourist information centers, and establishing ICT systems at airports. Despite these efforts and the tourist industry's proactive approach, gaps remain at each stage of implementation. According to the research done by previous writers, Nepal also lacks established rules and plans, roads, physical infrastructure, and the ability to integrate and use digital technologies. This study looks at a website's fundamental requirements from the perspective of the user, which might lead to the development of better travel websites.(Sedai, 2011)

We suggest creating an online tourist information system for Nepal that would provide thorough, precise, and easily navigable data on a range of topics related to the country's tourism industry. The tourist products will be shown in a geographic context on interactive maps using Geographic Information System (GIS) technology, which will enable users to study and see the spatial linkages between various areas of interest. To deliver accurate and timely information about Nepal's tourist destinations, historical sites, protected areas, cities and towns, pilgrimage sites, events and festivals, and more, the system will also integrate data from other sources, including the Nepal Tourist Board and online travel guides. Features like online booking, reviews, ratings, comments, and

ideas will all be included in the system to improve customer pleasure and experience. (Telfer, D.J. & Sharpley, 2008)

3.2 Development of tourism in Nepal

Similar to its history, travel has always been a human pleasure. However, before the invention of the steam engine and motor cars in the early 19th century, travel was a very taxing and tiresome task. There were no tourist amenities, therefore only a few courageous and unyielding people used to go there. Therefore, travel was considered a luxury enjoyed only by a select few, with commerce, education, and religion serving as the main drivers behind lengthy and perilous journeys to remote areas. In Nepal, there has always been tourism. Travelers have been visiting Nepal in one way or another for a very long time. First and foremost, it is appropriate to display a legend in this circumstance. The Kathmandu Valley was made habitable for human settlement when water began to flow out of the valley due to Manjushree's sword-wielding, according to legend. Despite theories to the contrary, Manjushree is regarded as the first traveler to Nepal, having arrived there from China or India.

Even in prehistoric times, there are tales of notable travelers to Nepal. The chronicle describes the journey to Nepal made by Gautam Buddha during the rule of Jitedasti, the seventh Kirat King, who ruled over the western region of the country, close to Swayambhu. Even Ashok, the Great King of ancient India, traveled to Nepal. King Ashok built the Ashok Pillar on his journey to Lumbini, the birthplace of Lord Buddha. He then went on to the Kathmandu Valley and built other such pillars there. (Bajracharya, 2020)

Three adjectives nature, adventure, and cultural beauty can be used to summarize Nepal's comparative advantage in tourism. The highest peaks in the world are also found in Nepal. Apart from a multitude of diverse and amiable cultures and religions, there's Mount Everest, a profusion of wildlife and flora in national parks, first-rate hiking trails, snow-fed rivers, and breath-taking lakes. Eight of the top fourteen peaks in the world, including Mount Everest, are located in Nepal. Trekking trails in Nepal's mid-hills and high Himalayas are among the greatest in the world; they stand out for their biophysical diversity and rich cultural heritage. The

historic structures and architecture of Kathmandu, Bhaktapur, and Lalitpur are the country's main draws; pilgrimage destinations include the Lord Shiva-focused Pashupatinath Temple and the Lumbini birthplace of Lord Buddha. The great diversity of Nepal's many ethnic groups' cultures, religions, and lifestyles is another draw. (Sindhupal, 2022)

Nepal is a tiny nation with an antiquated economy that moves slowly, but it is remarkable for its abundance of natural resources, rich cultural heritage, and strong spiritual foundation. One of its main draws is the abundance of plants and animals. Nepal is well-liked as an adventure travel destination because to its distinctive topography. Nepal is one of the world's top travel destinations for mountaineers, rock climbers, and adventure seekers. Nepal is a popular destination for vacationers because of its friendly locals, great climate, and appeal to adventure-seeking tourists. Nepal's tourism prospects are quite promising due to its unique geography, which offers a wealth of natural beauty, mountains, plants, history, and cultural variation, among other things.

Even though Nepal hasn't yet realized its full potential, if sufficient infrastructure is built, the country's poverty rate will significantly decline and tourism would undoubtedly help Nepal. Nepal is just one of the many nations over the globe where tourism serves as a significant revenue stream. One of Nepal's main economic streams has been tourism. Nepal's growth has been significantly influenced by tourism. The tourist business may prove to be highly beneficial to the nation since it generates foreign currency and jobs, both of which are essential to the country's overall economic growth. (Ranganath, 2015)

Principal Tourist Activities in Nepal: Nepal is a tourist's paradise, offering a variety of activities that are briefly discussed here:

Rural Tourism: The majority of people in Nepal live in remote, secluded villages that are home to several ethnic groups, providing tourists with a genuine sense of the unique way of life and culture of the nation. In addition, tourism in Nepal supports

other significant projects, such as the nation's reforestation, the reform of agriculture, the generation of income, the exchange of knowledge and culture, etc.

Mountain Climbing: The distinctive alpine scenery of Nepal is well-known, drawing large numbers of visitors there. Only 326 of the 1792 mountain summits are accessible for climbing, even though 1310 of them are higher than 6000 meters.

Trekking: Additionally, Nepal offers fantastic trekking locations with breathtaking scenery that draw visitors in and persuade them to remain longer. (D. P. Dhakal, 2011)

Visiting Religious and Cultural Sites: Particularly for Buddhism and Hinduism, Nepal is home to a large number of historically and artistically significant religious and cultural sites. Ten Nepalese cultural and religious monuments have been inducted as World Heritage monuments by UNESCO.

Rafting: There are many rivers in Nepal, and some of them run rather quickly, making them great for whitewater rafting. Rafting is another way for visitors to see the nation's natural and cultural splendor.

Bungee Jumping: Nepal is home to several thrilling Bungee Jumping destinations that provide guests with wonderful adventurous experiences and a terrific time. The Bhote Koshi site serves as the main venue for these events.

There are tons of other activities available in addition to these, such rock climbing, mountain biking, hot air ballooning, paragliding, mountain flying, shopping for locally made items, visiting museums, meditation, and so on. These pursuits are fundamentally related to ecotourism, or travel focused on the natural world, animals, and cultural heritage. However, the management of all activities will always play a major role in the smooth running of ecotourism in Nepal. Apart from its many benefits, tourism may also have detrimental impacts on the environment, including excessive environmental pressure, pollution, loss of natural areas and landscapes, depletion of water supplies, loss of cultural heritage, and a rise in drug abuse and

criminal activity. Consequently, it is essential to increase tourism while accepting the goals of local development and environmental preservation that go hand in hand. Ecotourism may thus be used as a preventative tool against the detrimental effects of mass tourism. In the end, the ideas of ecotourism were also accepted by Nepal's travel industry as a way to promote responsible and beneficial travel to the country. (R. Dhakal, 2015)

3.3 Previous studies on web-based information systems

Website design and quality is a hot topic for researchers with the growth and demand of web-based systems in business organizations. Different studies have been conducted at different time intervals that talk about different aspects of website research and development which include content, organization, design, reach, indexing, etc. The evolution of this technology has still not provided any standard reference model to guarantee a perfect web design. (Garett et al., 2016), (Morales-Vargas et al., 2020)

The researchers have used different tools and applied different methodologies in the web design field to study design solutions, recommendations, architectural needs and other business aspects. Some studies done by different authors include, design and commercial development of seasons and activities, visa information section, exploration of tourism destination by interest, digital assistance, applications and tools and visitor contribution. Each section further consisted of important tourism business components the provided a space for selecting a product, a service or search for an information. Web structure, content organization, easy navigability, text appearance, color combination, security, user profiling, inbuilt search, speed and performance optimization were the extended UI design considerations.

Figure 2: Welcome screen having interactive menus for user preference

(Source: Shrestha D, 2020)

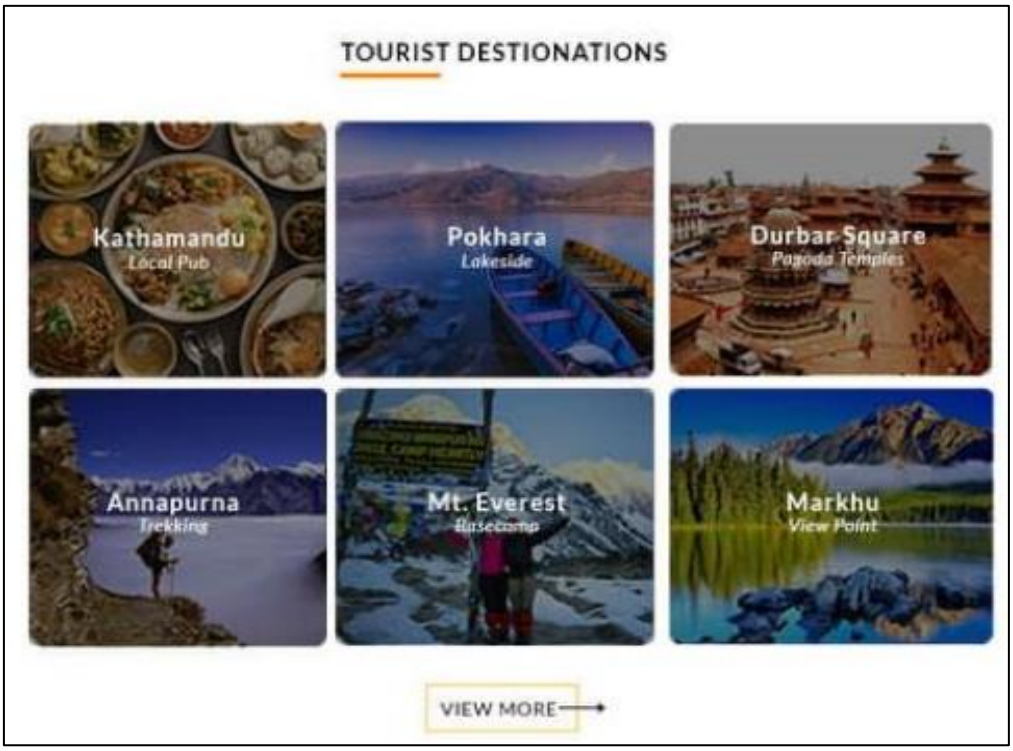


Figure 3: Tourist destination selection and news update windows

(Source: Shrestha D, 2020)

Figure 4: Tourism activity based on month and tourism activities

(Source: Shrestha D, 2020)

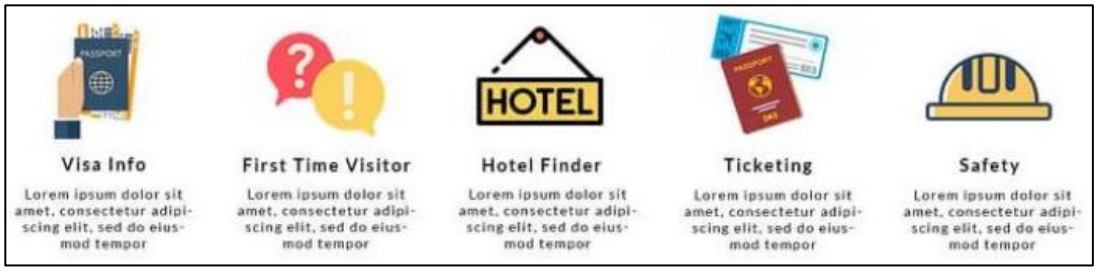


Figure 5: Visa information with associated information components

(Source: Jeong S, 2020)

Figure 6: Representing exploration based on tourist interest

(Source: Wenan T, 2020)

Figure 7: Recommender systems for tourism products and services

(Source: Shrestha D, 2020)

Figure 8: Representing applications & tools for tourism assistance

(Source: Maharjan S, 2020)

Figure 9: Visitor contribution section based on their experience and sharing

(Source: Shrestha D, 2020)

3.4 Importance of User Interface Design in Travel Websites

In the competitive landscape of travel websites, UI design plays a pivotal role in attracting and retaining users. By adhering to certain principles, entrepreneurs can enhance their websites' appeal and usability: An enticing UI should evoke the essence of travel through captivating images of destinations, activities, and cultural experiences. These visuals serve to inspire wanderlust and engage visitors effectively.

To ensure ease of navigation, simplify the interface by providing clear menu labels, intuitive navigation bars, and well-organized content categories. A clutter-free design facilitates seamless exploration and enhances user experience. Addressing common visitor queries and concerns upfront, such as transportation options, accommodation choices, and safety tips, instills confidence and fosters trust in the website.

Given the prevalence of mobile usage in travel planning and booking, it's imperative to prioritize mobile-friendly designs. Responsive layouts, minimal text, and optimized images are essential for ensuring a seamless experience across devices. Personalization features, including filters, tailored recommendations, and loyalty programs, create a more personalized and engaging experience for users. However, it's crucial to strike a balance and avoid intrusive tactics. Ultimately, an effective UI guides visitors toward completing desired actions, such as booking trips, through clear calls-to-action and a streamlined checkout process. (Unicorn Platform, 2023)

3.4.1 Key Elements of Travel Website UI Design

Several key elements contribute to an effective travel website UI:

- **Images and Visuals:** Utilize high-quality images to showcase destinations and experiences, including hero images, galleries, and videos, to immerse users in the travel experience.
- **Clear Navigation and Categorization:** Implement a simple and consistent navigation menu, supplemented by logical categorization and descriptive page titles, to facilitate easy exploration.

- **Call-to-Action Buttons:** Strategically place prominent CTAs like "Book Now" or "Learn More" to encourage conversions and guide users toward desired actions.
- **Responsiveness for Mobile Users:** Optimize the UI for mobile devices with a focus on simplicity, large tap targets, and fast load times to enhance the mobile user experience.
- **Personalized Content:** Tailor the website experience with personalized recommendations and features to deepen user engagement and connection. (Unicorn Platform, 2023)

3.4.2 Optimizing the Homepage for Travel Website UI

The homepage serves as the gateway to a travel website, and optimizing it is crucial for capturing user interest:

- **Focus on High-Quality Images:** Leverage captivating visuals of landscapes, activities, and cultural elements to entice visitors and evoke the allure of travel destinations.
- **Clear Value Proposition:** Articulate the website's purpose and offerings prominently, utilizing descriptive keywords to resonate with the target audience.
- **Call-to-Action Buttons:** Incorporate prominent CTAs throughout the homepage to prompt user engagement and guide them towards trip planning tools or booking services.
- **Balanced Layout:** Strike a balance between visuals and text, ensuring an uncluttered yet compelling layout that provides sufficient context and encourages exploration.
- **Personalized Content:** Enhance user experience by presenting personalized destination content and recommendations based on user preferences and behavior. (Unicorn Platform, 2023)

3.5 Overview of User-Centered Design

3.5.1 Introduction to User-Centered Design

When evaluating product design, many emphasize aesthetics and perceived intuitiveness. However, ensuring functionality requires more than just design skills. Relying solely on intuition and assumptions often results in user experience issues. Even with impeccable visual design, involving users in the design process is crucial for success. User-centered design (UCD) places users at the forefront of the design process, ensuring that products meet their needs effectively. (Next, 2024)

3.5.2 User-Centered Design: Definition and Importance

User-centered design (UCD) prioritizes users throughout the design process, considering their needs, objectives, and feedback at every stage. By focusing on users, designers can create products that establish meaningful connections with their intended communities. Without user input, the purpose of a product becomes questionable. UCD ensures that products not only offer value but also deliver that value in a user-friendly manner, fostering a positive user experience crucial for long-term success in competitive markets. (Next, 2024)

3.5.3 Human-Centered vs. User-Centered Design

While all users are human, not all humans are users of a particular product. Understanding the distinction is vital for effective design. Successful user-centered design requires in-depth knowledge of the target audience, obtained through extensive research. By comprehensively understanding users' challenges and aspirations, designers can create well-rounded user personas that guide design priorities, ensuring that the product addresses various user needs effectively. (Next, 2024)

3.5.4 Essential Principles of User-Centered Design

User-centered design operates on several key principles essential for successful implementation.

- **Early User Involvement:** Users should be involved from the outset to understand their requirements accurately and avoid deviating from the right path during product development.
- **Empathy:** Design should focus on addressing users' pain points rather than merely launching a product for expedience.
- **Iterative Process:** Design evolves through multiple iterations, incorporating feedback and making necessary adjustments to ensure continuous improvement.
- **Multiple Feedback Loops:** Gathering diverse data types, including qualitative and quantitative feedback, aids in evaluating product effectiveness and guiding further enhancements.
- **Fundamental Design Principles:** While emphasizing user-centricity, adherence to the fundamentals of good design remains crucial for effective implementation. (Next, 2024)

3.5.5 User-Centered Design Methods

Various research methods complement user-centered design principles, providing valuable insights into user preferences and behaviors:

- **Focus Groups:** Inviting groups of users to collectively share thoughts and opinions facilitates understanding of product use cases and perspectives.
- **Questionnaires & Surveys:** Structured feedback collection via questionnaires and surveys yields statistical data on user challenges and needs.
- **Interviews:** Open-format interviews enable in-depth insights into individual user needs and behaviors, particularly valuable in the early design stages.
- **Usability Testing:** Direct interaction with prototypes allows for feedback collection on user interaction and identification of issues or bugs.
- **Card Sorting:** Testing and refining website or application architecture through user-driven content organization aids in building a user-friendly structure.

- **Participatory Design:** Involving stakeholders in prototype generation fosters collaborative decision-making but requires effective coordination and analysis. (Next, 2024)

3.5.6 Developing a User-Centered Design Process

Creating a user-centered design process involves several key steps to ensure effective integration of user needs into product development:

- **Research:** Conduct comprehensive research to understand user needs and behaviors, informing the development of user personas.
- **Define and Align Requirements:** Establish clear project boundaries and goals, ensuring alignment with user needs and technical feasibility.
- **Design Solutions:** Prototype design solutions based on research insights, validating decisions at each step to maintain alignment with user needs.
- **Evaluate with Feedback:** Gather extensive user feedback through testing and observation, identifying areas for improvement and alignment with user research.
- **Iterate:** Continuously refine designs based on feedback, embracing failure as part of the iterative process to ultimately deliver a product that delights users. (Next, 2024)

User-centered design forms the foundation for creating successful and impactful products by prioritizing user needs throughout the design process. By embracing user-centricity, employing appropriate research methods, and following a structured design process, organizations can develop products that resonate with users and stand out in competitive markets. (Next, 2024)

3.6 UML Diagrams

A Unified Modeling Language (UML) diagram is a partial graphical depiction of a system model that is either being developed, implemented, or is already in existence. Under UML, you'll find all of the graphical elements, or symbols. The project's future requirements may be met by making use of the many diagrams that were created throughout the system's design, modeling, and maintenance stages. A use case diagram depicts the system's functionality, a class diagram shows the system's structure, and other similar diagrams help developers understand the system's inner workings before developing it. The Unified Modeling Language (UML) is a graphical tool for designing, analyzing, and implementing system processes. For example, you can't use it to depict a state machine inside a use case since it can't combine different types of diagrams. This is because merging structural and behavioral aspects is necessary. In UML specifications, there are two main types of diagrams: (Nishadha, 2022)

- Structural diagrams,
- Behaviour diagrams

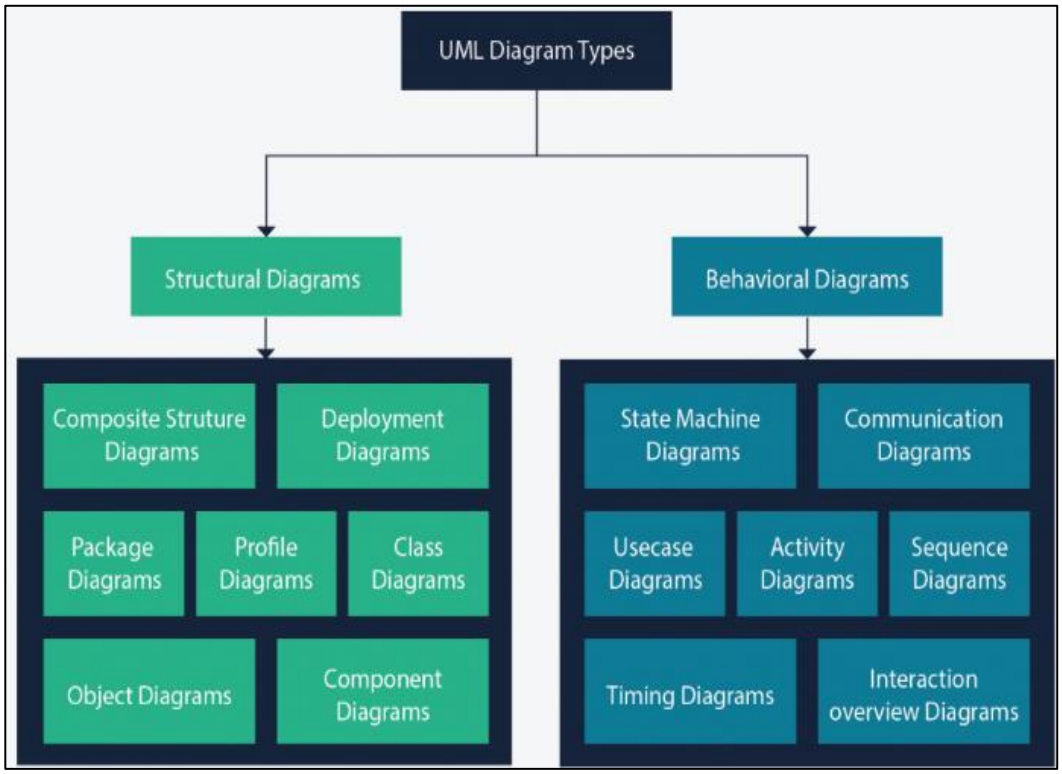


Figure 10: Types of UML Diagrams

(Source: Creately, 2024)

3.6.1 Structural Diagrams:

To illustrate the idea of a system and its interconnections in a way that is independent of time, structural diagrams show the system's static structure. In a structural diagram, each piece represents a connection that is either structural or semantic. Neither the time-related idea nor the specifics of the dynamic behavior are shown in these illustrations. These diagrams show the flow of data through the system, from input to processing and ultimately to the output. Some examples of structural diagrams include:

- Class Diagram
- Component Diagram
- Deployment Diagram
- Object Diagram
- Package Diagram
- Profile Diagram
- Composite Strcuture Diagram

Class Diagram: Class diagrams serve as the foundation of object-oriented solutions, illustrating the classes, attributes, operations, and relationships within a system. They provide a high-level overview of the system's structure, enabling stakeholders to grasp its key entities and their associations. Class diagrams are indispensable in object-oriented analysis and design, guiding developers in implementing robust and scalable software solutions. (Nishadha, 2022)

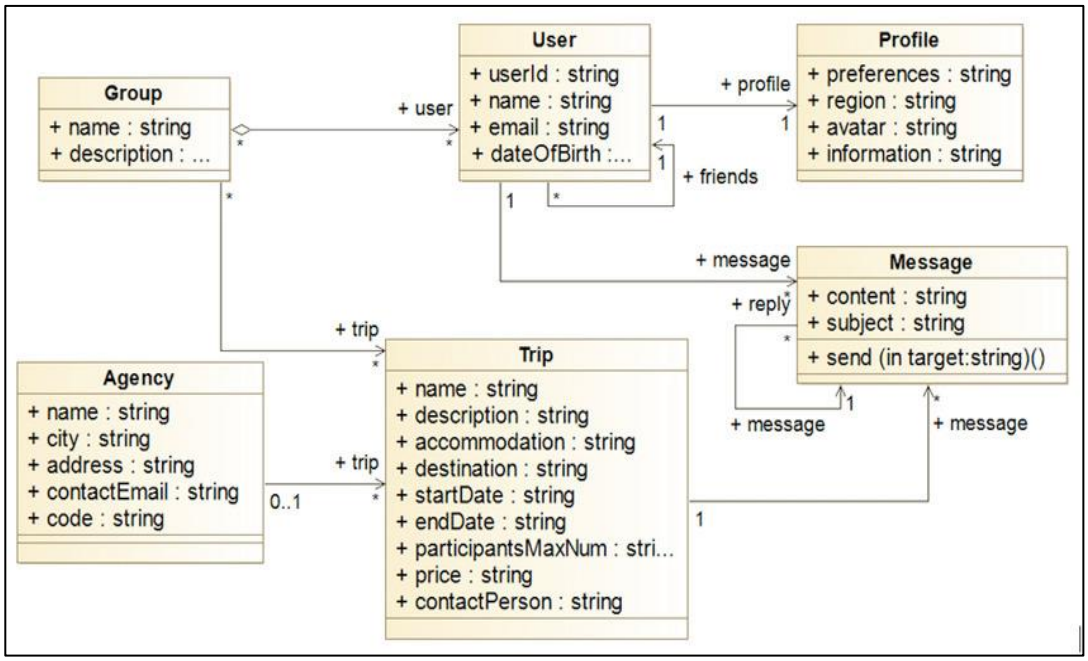


Figure 11: Class Diagram

(Source: Tesoriero, 2022)

Component Diagram: Component diagrams depict the structural relationships among components in a software system, particularly useful for complex systems with multiple components communicating via interfaces. These diagrams facilitate understanding of system architecture, component dependencies, and system scalability. By visualizing component interactions, developers can design modular and maintainable software systems. (Nishadha, 2022)

Deployment Diagram: Deployment diagrams visualize the hardware and software configurations of a system, facilitating understanding of system deployment across multiple machines. They provide insights into system distribution, scalability, and fault tolerance. Deployment diagrams are instrumental in system deployment planning, ensuring seamless deployment and efficient resource utilization. (Nishadha, 2022)

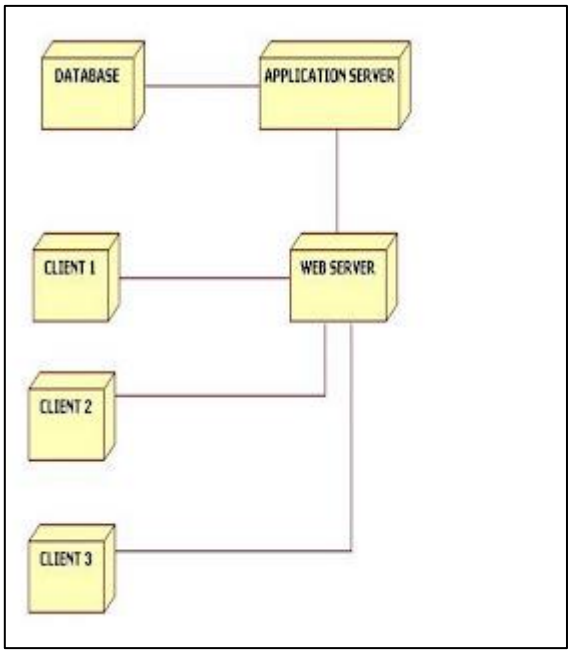


Figure 12: Deployment Diagram

(Source: Programsformca, 2012)

Object Diagram: Object diagrams, also known as Instance diagrams, demonstrate real-world examples of object relationships within a system, offering insights into complex object relationships. They provide concrete instances of classes and their relationships, aiding in understanding system behavior and data flow. Object diagrams are valuable in system modeling, testing, and debugging, allowing developers to validate system design and behavior. (Nishadha, 2022)

Package Diagram: Package diagrams showcase dependencies between different packages in a system, aiding in understanding the system's modular structure. They provide a hierarchical view of system components, illustrating package dependencies and relationships. Package diagrams facilitate modular design, component reuse, and system maintenance. (Nishadha, 2022)

Profile Diagram: Profile diagrams, introduced in UML 2, are rarely used and primarily focus on defining profiles for specialized modeling needs. They enable customization of UML for specific domains or applications, allowing developers to extend UML to suit their modeling requirements. Profile diagrams are useful in defining domain-specific modeling languages and customizing UML for specialized applications. (Nishadha, 2022)

Composite Structure Diagram: Composite structure diagrams illustrate the internal structure of a class, providing insights into the composition of complex classes. They depict the interactions and relationships among internal parts of a class, facilitating understanding of class behavior and functionality. Composite structure diagrams are valuable in system design and analysis, enabling developers to model complex class compositions and relationships effectively. (Nishadha, 2022)

3.6.2 Behavioral Diagrams

Behavioral diagrams focus on illustrating the interactions and behaviors within a system, offering a dynamic view of its functionality. They capture the system's runtime behavior, user interactions, and control flow. Each behavioral diagram type provides unique insights into system behavior, aiding in understanding, designing, and testing software solutions effectively. Some examples of Behavioral diagram includes:

- Use Case Diagram
- Activity Diagram
- State Machine Diagram
- Sequence Diagram
- Communication Diagram
- Interaction Overview Diagram
- Timing Diagram

Use Case Diagram: Use case diagrams provide a graphical overview of actors, their interactions, and the functions required by actors within a system. They depict the system's functionality from a user's perspective, illustrating user goals, scenarios, and system functionalities. Use case diagrams are instrumental in requirements analysis, system design, and user interface design. (Nishadha, 2022)

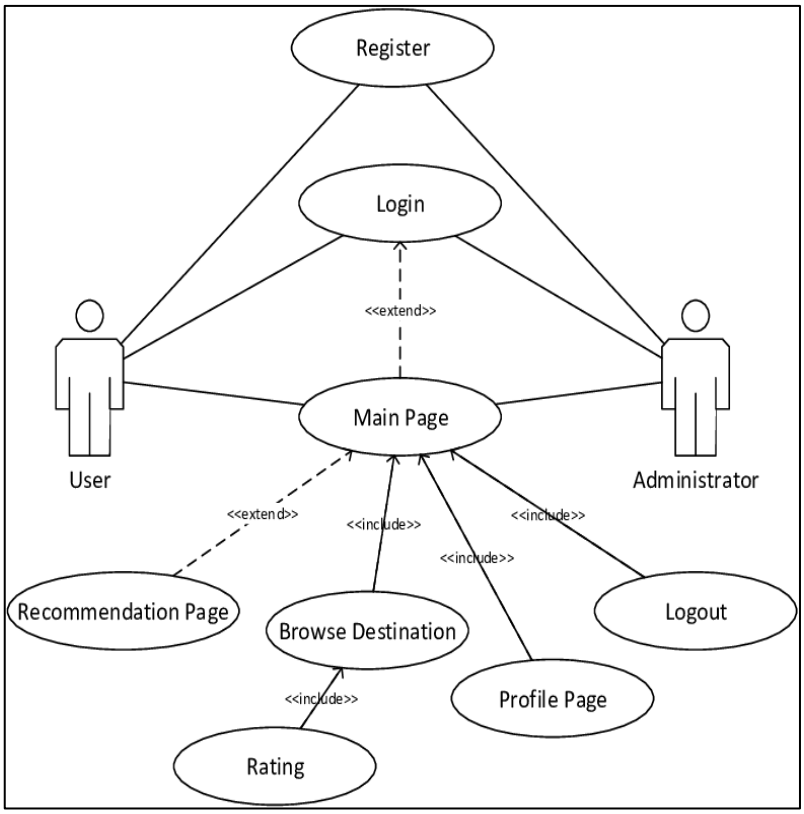


Figure 13: Use Case Diagram

(Source: Suharjito, 2021)

Activity Diagram: Activity diagrams visually represent workflows within a system, describing business or operational workflows using various symbols and notations. They capture the system's procedural logic, control flow, and concurrency, aiding in understanding system behavior and process orchestration. Activity diagrams are useful in business process modeling, system design, and software engineering. (Nishadha, 2022)

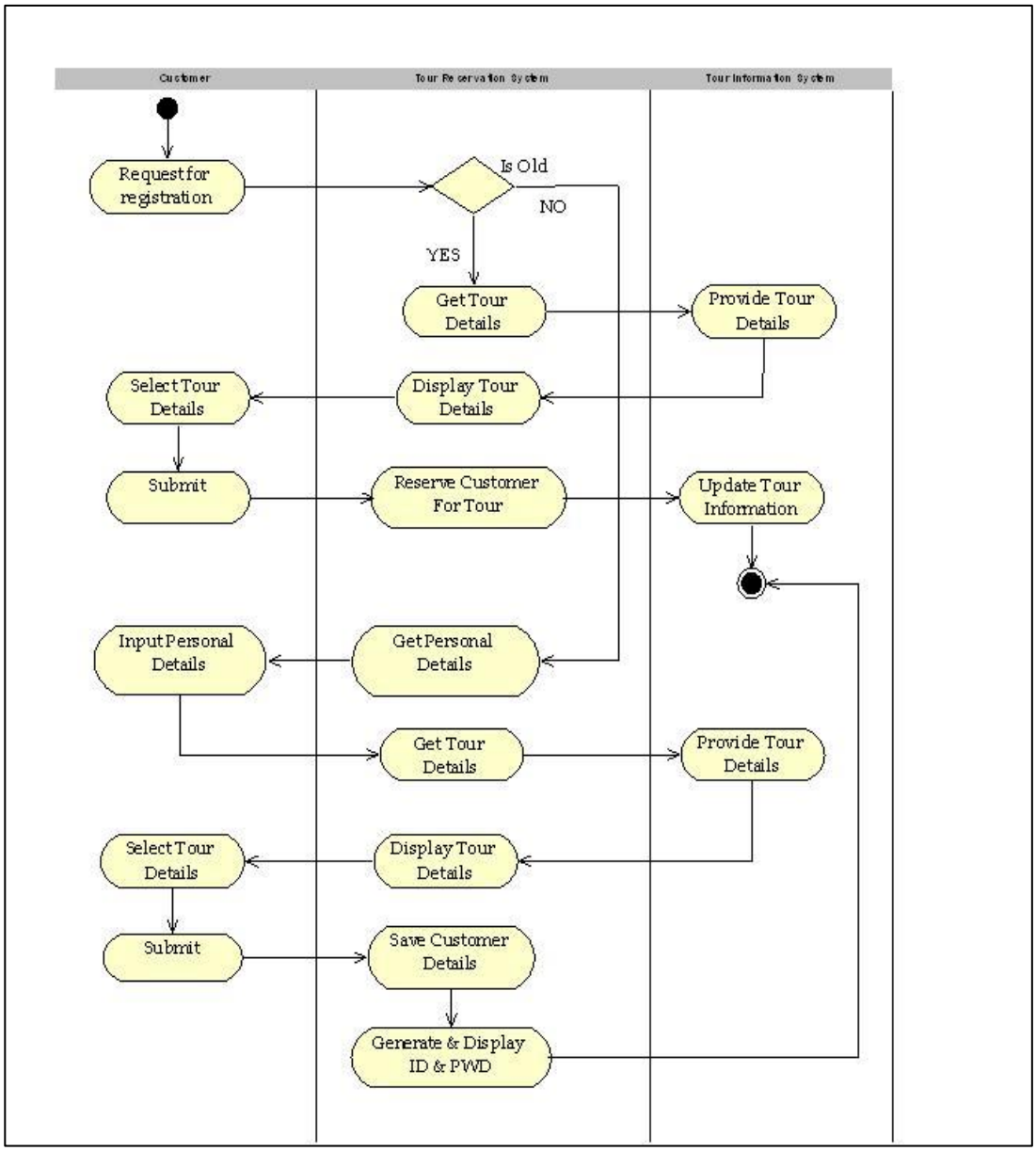


Figure 14: Activity Diagram

(Source: Programsformca, 2021)

State Machine Diagram: State machine diagrams, also known as state charts, describe the behavior of objects based on their current state, facilitating understanding of object behavior. They model the state transitions, events, and actions of objects, capturing the system's dynamic behavior. State machine diagrams are valuable in modeling reactive systems, protocol design, and embedded systems. (Nishadha, 2022)

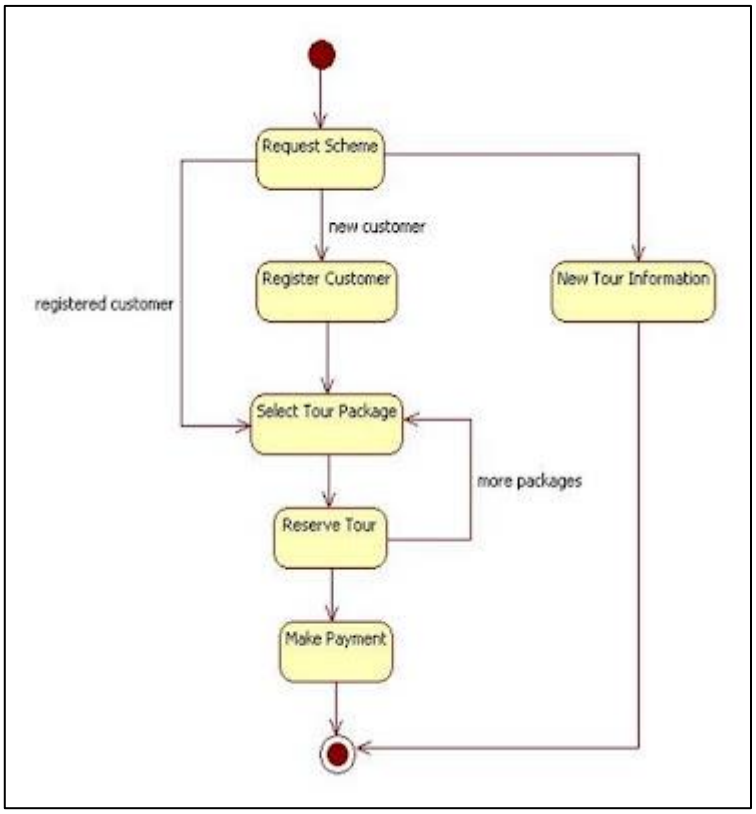


Figure 15: Elements of a state diagram

(Source: Programsformca, 2021)

Sequence Diagram: Sequence diagrams illustrate object interactions and the order of interactions within a specific scenario, representing processes vertically and interactions as arrows. They capture the message passing between objects, object lifelines, and the sequence of method invocations. Sequence diagrams are instrumental in system design, testing, and communication among stakeholders. (Nishadha, 2022)

Communication Diagram: Communication diagrams, formerly known as collaboration diagrams, focus on messages exchanged between objects, providing insights into object interactions. They depict the communication paths between objects, message flow, and object relationships. Communication diagrams are useful in system design, protocol analysis, and system documentation. (Nishadha, 2022)

Interaction Overview Diagram: Interaction overview diagrams, akin to activity diagrams, depict sequences of interaction diagrams, showcasing a collection of interaction types and their order of occurrence. They provide an overview of system interactions, message flows, and interaction scenarios. Interaction overview

diagrams are useful in system design, sequence modeling, and system analysis. (Nishadha, 2022)

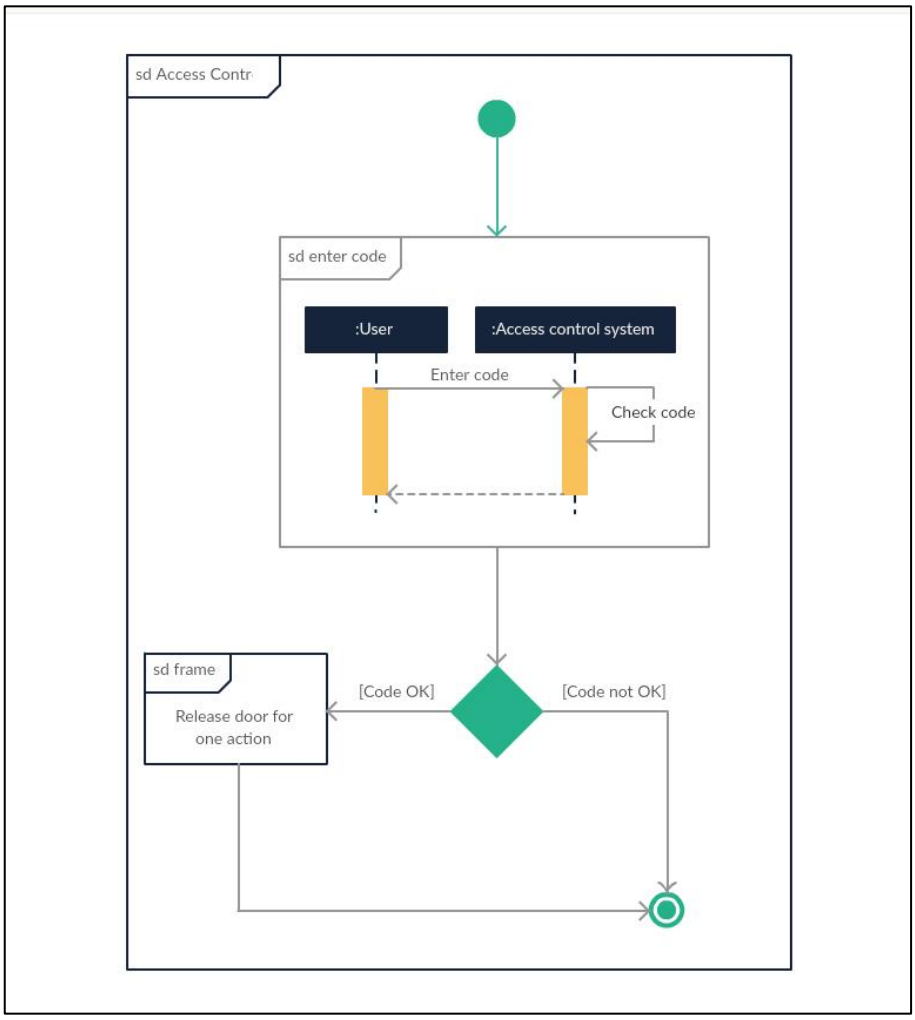


Figure 16: Interaction overview Diagram

(Source: Creately, 2024)

Timing Diagram: Timing diagrams depict object behaviors within a given time frame, particularly useful for representing interactions between multiple objects over time. They visualize timing constraints, event occurrences, and object interactions, aiding in understanding system timing and synchronization. Timing diagrams are valuable in real-time system design, performance analysis, and system optimization. (Nishadha, 2022)

3.7 Research Gap

The research gap identified in this study pertains to the absence of comprehensive web-based information systems specifically tailored to the needs of tourists visiting Nepal. Despite the significant growth in tourism in the region, existing systems have failed to adequately address key aspects of user satisfaction, particularly in terms of user interface (UI) design, navigation clarity, and accessibility.

Existing tourism websites in Nepal often lack a user-centric approach to design, resulting in suboptimal user experiences. Visitors may encounter difficulties in navigating the website, locating relevant information, and accessing essential services. This can lead to frustration and disengagement, ultimately impacting the overall satisfaction and enjoyment of the tourist experience.

Furthermore, there is a notable deficiency in the availability of comprehensive and up-to-date information on Nepal's attractions, services, and safety measures. Tourists may struggle to find reliable and timely information to plan their trips effectively, leading to inefficiencies and missed opportunities for exploration and enjoyment.

This research seeks to address these shortcomings by proposing a user-centered approach to design and evaluating a new web-based information system specifically tailored to the needs of tourists visiting Nepal. By prioritizing user needs and preferences, optimizing key UI elements, and leveraging effective prototyping techniques, stakeholders can create a more engaging and intuitive user experience that enhances overall satisfaction and enjoyment for tourists exploring Nepal's rich cultural and natural heritage.

4. Practical part

4.1 Sampling Method

The survey, an integral component of this research, aimed to gather feedback from users regarding the existing web-based information systems designed for tourists in Nepal. A total of 238 respondents participated in the survey. An online consent was undertaken after asking their interest to take part in the research. The respondents were divided into 4 classes which included tourism business personnels, government officials, frequent travelers and website designers. The domestic respondents were contacted both through online media. The international tourists were provided the questionnaire through online media with assistance of Facebook, Google and peer group contacts. These individuals comprised tourists from various parts of the world who had either visited Nepal or were planning to do so. To ensure a diverse range of perspectives, the survey was disseminated through Google Forms across different social media platforms frequented by individuals interested in visiting Nepal. The survey questionnaire, consisting of 10 questions, focused on assessing user satisfaction with various aspects of UI designs. Quantitative information was attained through the open and close-ended questionnaire, and the responses of participants were primarily coded utilising Likert scale that is designed determining the value of (1= strongly agree, 5=strongly disagree). The purpose was to ascertain users' preferences and opinions to identify areas for potential improvement in the existing systems.

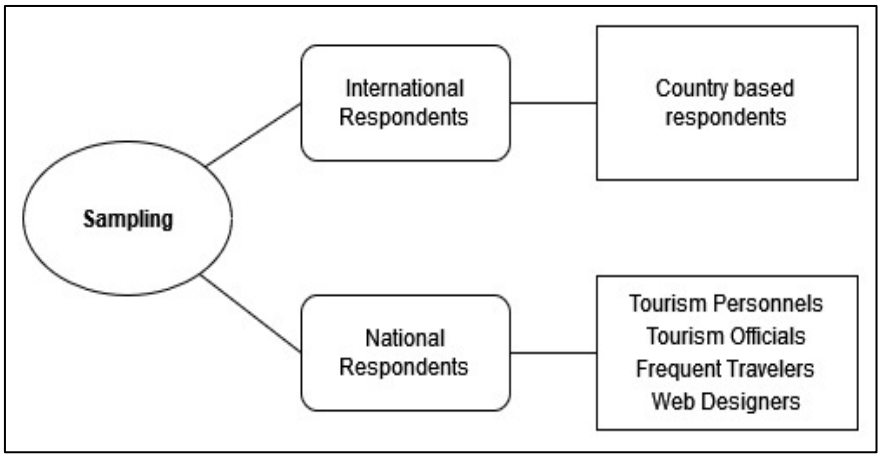


Figure 17: Sampling Outline of the Study

(Source: Author)

4.1.1 Descriptive Statistics of Survey on Existing systems

Descriptive Statistics				
	N	Min	Max	Mean
Satisfaction with the overall user interface design of the website	238	1	5	2.29
Satisfaction with the overall color scheme used in the UI	238	1	5	2.32
Rating the clarity of the website's navigation menus	238	1	5	2.34
Visibility and accessibility of key buttons and call-to-action elements	238	1	5	2.45
Overall aesthetics of UI elements, including buttons and input fields	238	1	5	2.84
Placement and visibility of important UI features like search bars	238	1	5	2.87
Satisfaction with the visual hierarchy of information on the UI	238	1	5	2.63
Evaluation of the consistency of design elements across different pages of the website	238	1	5	2.37
How well the UI guides you through multi-step processes, if applicable	238	1	5	2.42
Evaluation of the use of tooltips or help features for explaining UI functionalities	238	1	5	1.95
Valid N (listwise)	238			

Table 1: Descriptive Statistics of Survey on Existing systems

(Source: Author)

Based on the descriptive statistics provided for the survey conducted on existing tourism websites in Nepal, here are some interpretations of the results. Satisfaction with UI Design: The mean satisfaction score for the overall user interface (UI) design of the websites is 2.29 out of 5, indicating potential areas for improvement in design aspects.

Satisfaction with Color Scheme: Similarly, the mean satisfaction score for the overall color scheme used in the UI is 2.32 out of 5, suggesting that respondents may not find the color schemes appealing or well-suited for the websites.

Navigation Clarity: The mean rating for the clarity of the website's navigation menus is 2.34 out of 5, indicating potential issues with the organization or presentation of navigation elements.

Visibility and Accessibility of Key Elements: The mean score for the visibility and accessibility of key buttons and call-to-action elements is 2.45 out of 5, implying possible difficulties in locating or interacting with important elements on the websites.

Overall Aesthetics: The mean rating for the overall aesthetics of UI elements is 2.84 out of 5, suggesting room for improvement in the visual appeal of the websites.

Placement of Important UI Features: The mean satisfaction score for the placement and visibility of important UI features like search bars is 2.87 out of 5, indicating that respondents may find these features relatively well-placed and visible on the websites.

Visual Hierarchy: The mean satisfaction score for the visual hierarchy of information on the UI is 2.63 out of 5, suggesting possible issues with the organization or prioritization of information.

Consistency of Design Elements: The mean evaluation score for the consistency of design elements across different pages of the website is 2.37 out of 5, indicating potential inconsistencies in design elements across various pages.

Guidance through Multi-Step Processes: The mean evaluation score for how well the UI guides users through multi-step processes is 2.42 out of 5, implying challenges in providing clear guidance for users during complex interactions.

Use of Tooltips/Help Features: The mean evaluation score for the use of tooltips or help features for explaining UI functionalities is 1.95 out of 5, indicating potential shortcomings in providing explanatory assistance or guidance within the UI.

Overall, these findings highlight areas where improvements can be made to enhance the user experience and usability of tourism websites in Nepal.

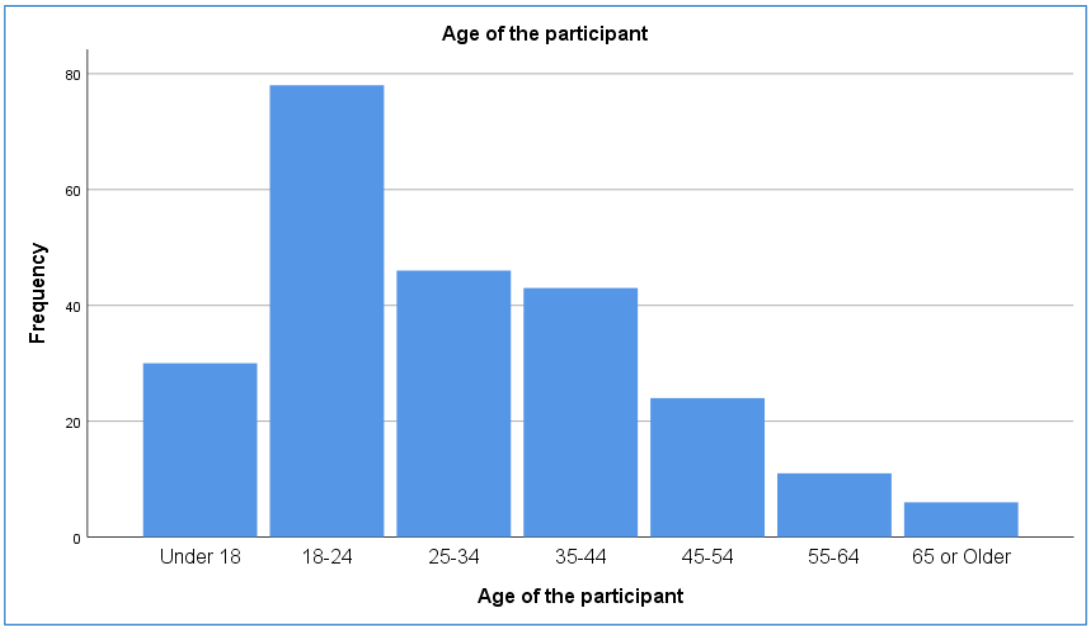
Frequency Table

Age of the participants					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 18	30	12.6	12.6	12.6
	18-24	78	32.8	32.8	45.4
	25-34	46	19.3	19.3	64.7
	35-44	43	18.1	18.1	82.8
	45-54	24	10.1	10.1	92.9
	55-64	11	4.6	4.6	97.5
	65 or Older	6	2.5	2.5	100.0
	Total	238	100.0	100.0	

Table 2: Age distribution of the participants

(Source: Author)

The age distribution of the participants shows that the majority fall within the age groups of 18-24 and 25-34, comprising 32.8% and 19.3% of the total participants, respectively.



Graph 1: Graphical Representation of Age of the participants

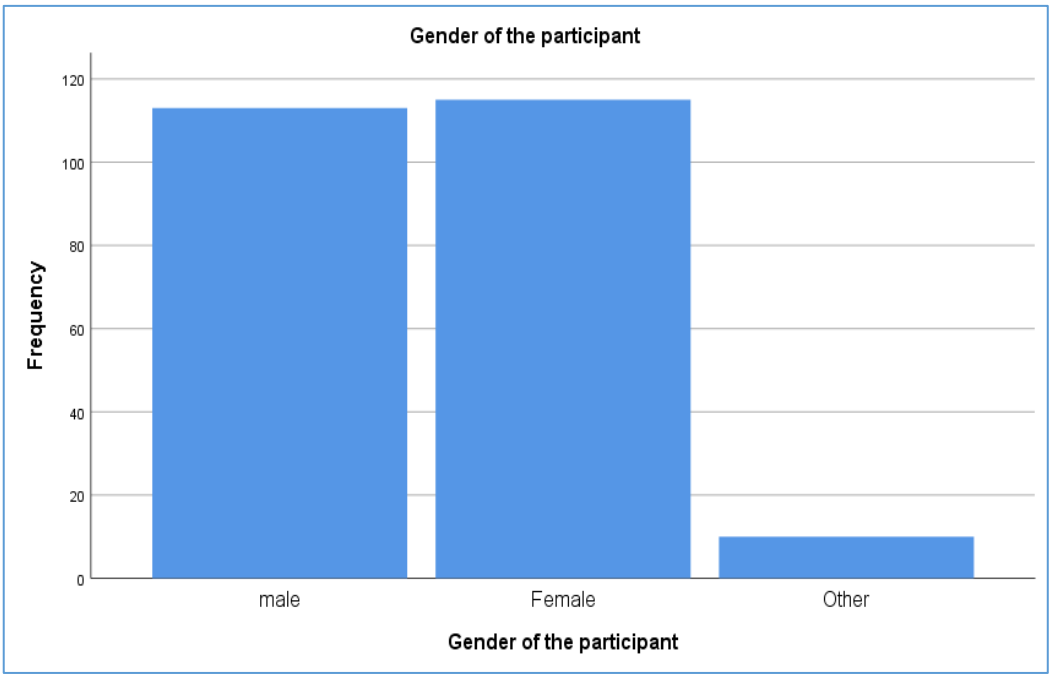
(Source: Author)

Gender of the participant					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	113	47.5	47.5	47.5
	Female	115	48.3	48.3	95.8
	Other	10	4.2	4.2	100.0
	Total	238	100.0	100.0	

Table 3: Frequency table of Gender of the participants

(Source: Author)

In terms of gender, the participants were almost evenly split between male (47.5%) and female (48.3%) respondents, with a small percentage identifying as "Other" (4.2%).



Graph 2: Graphical representation of Gender of the participants

(Source: Author)

How often do you visit travel and tourism websites?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rarely	17	7.1	7.1	7.1
	Occasionally	155	65.1	65.1	72.3
	Regularly	57	23.9	23.9	96.2
	Frequently	9	3.8	3.8	100.0
	Total	238	100.0	100.0	

Table 4: Frequency table of how often do you visit travel and tourism websites?

(Source: Author)

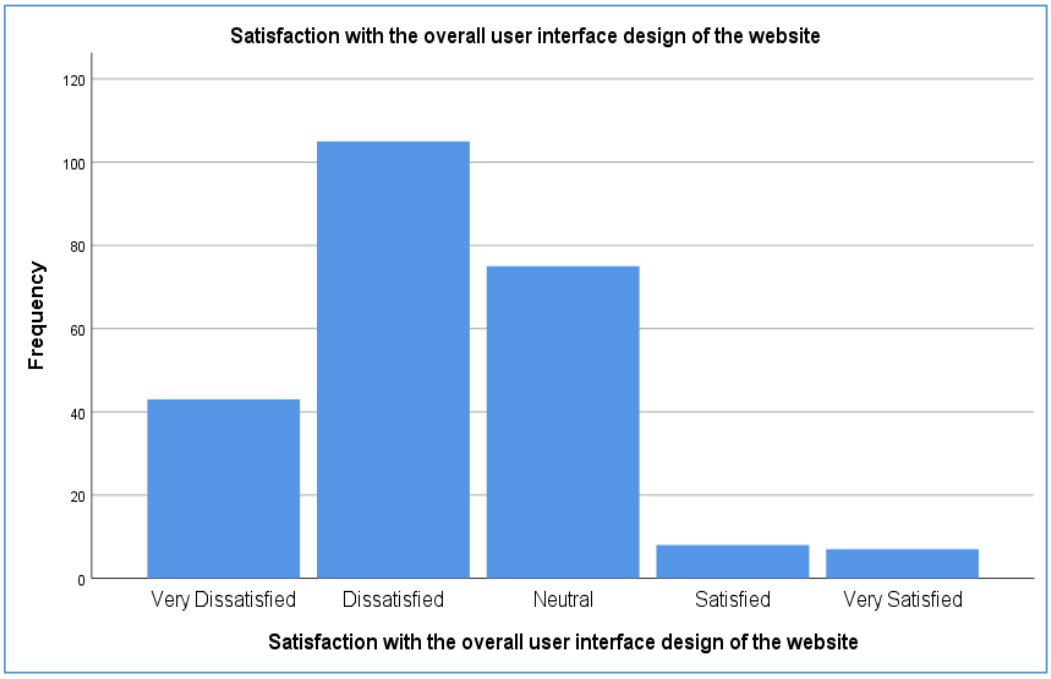
The data indicates that most particpants visit travel and tourism websites occcasionally (65.1%) or regulary (23.9%), with smaller percentages visiting rarely (7.1%) or frequently (3.8%).

Graph 3: Graphical representation of how oftern do you visit travel and tourism website? (Source: Author)

Satisfaction with the overall user interface design of the website					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	43	18.1	18.1	18.1
	Dissatisfied	105	44.1	44.1	62.2
	Neutral	75	31.5	31.5	93.7
	Satisfied	8	3.4	3.4	97.1
	Very Satisfied	7	2.9	2.9	100.0
	Total	238	100.0	100.0	

Table 5: Frequency table of satisfaction with overall user interface design of the website (Source: Author)

Regarding satisfaction with the overall user interface design, the majority of participants were either dissatisfied (44.1%) or neutral (31.5%), with smaller percentages being very satisfied (2.9%) or satisfied (3.4%).



Graph 4: Graphical representation of satisfaction with the overall user interface design of the website

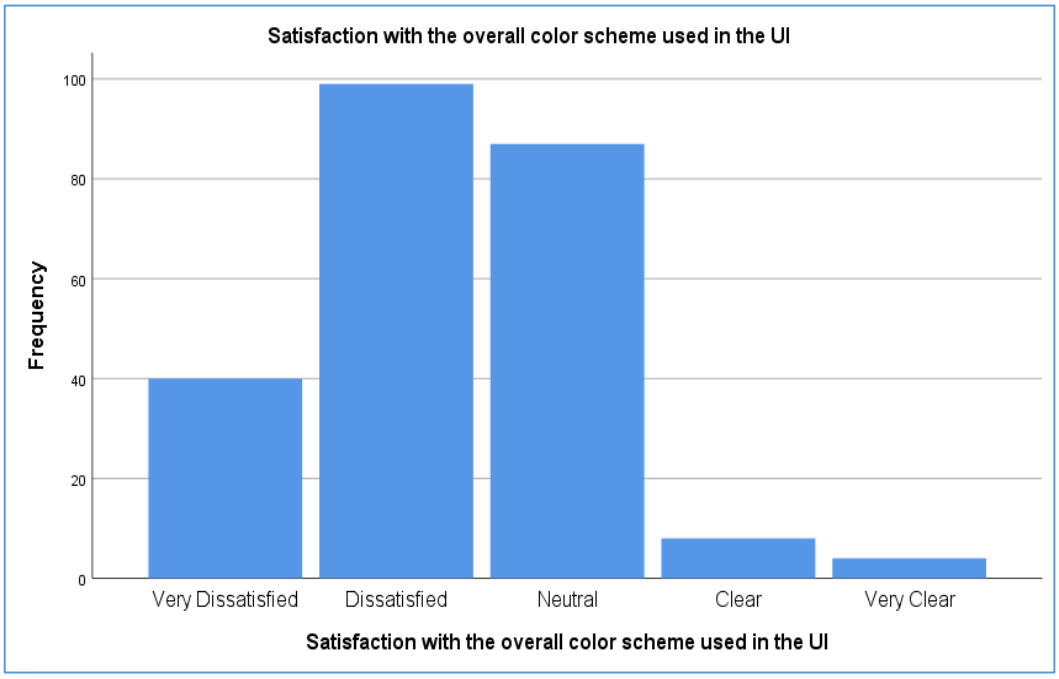
(Source: Author)

Satisfaction with the overall color scheme used in the UI					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	40	16.8	16.8	16.8
	Dissatisfied	99	41.6	41.6	58.4
	Neutral	87	36.6	36.6	95.0
	Clear	8	3.4	3.4	98.3
	Very Clear	4	1.7	1.7	100.0
	Total	238	100.0	100.0	

Table 6: Frequency table of satisfaction with the overall color scheme used in the UI

(Source: Author)

Participants' satisfaction with the color scheme used in the user interface varied, with a significant portion being either dissatisfied (41.6%) or neutral (36.6%). A smaller percentage found the color scheme clear (3.4%) or very clear (1.7%).



Graph 5: Graphical representation of satisfaction with the overall color scheme used in the UI

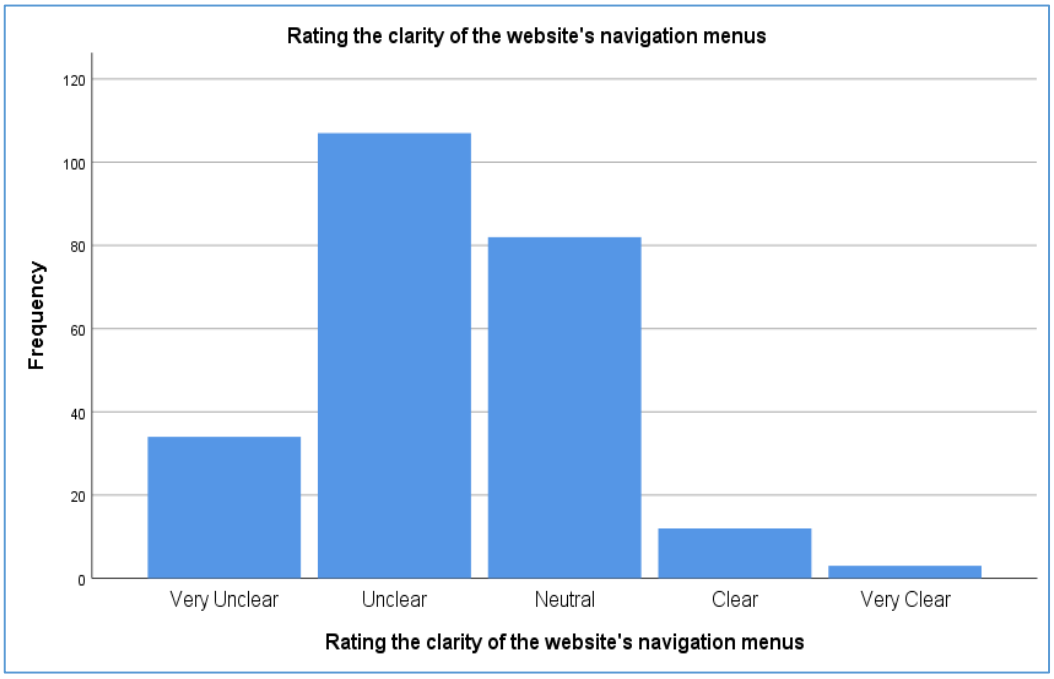
(Source: Author)

Rating the clarity of the website's navigation menus					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unclear	34	14.3	14.3	14.3
	Unclear	107	45.0	45.0	59.2
	Neutral	82	34.5	34.5	93.7
	Clear	12	5.0	5.0	98.7
	Very Clear	3	1.3	1.3	100.0
	Total	238	100.0	100.0	

Table 7: Frequency table of rating the clarity of the website's navigation menus

(Source: Author)

The clarity of the website's navigation menus was rated as unclear by a majority of participants, with 45.0% finding them unclear and 34.5% neutral. A smaller percentage rated them as very clear (1.3%).

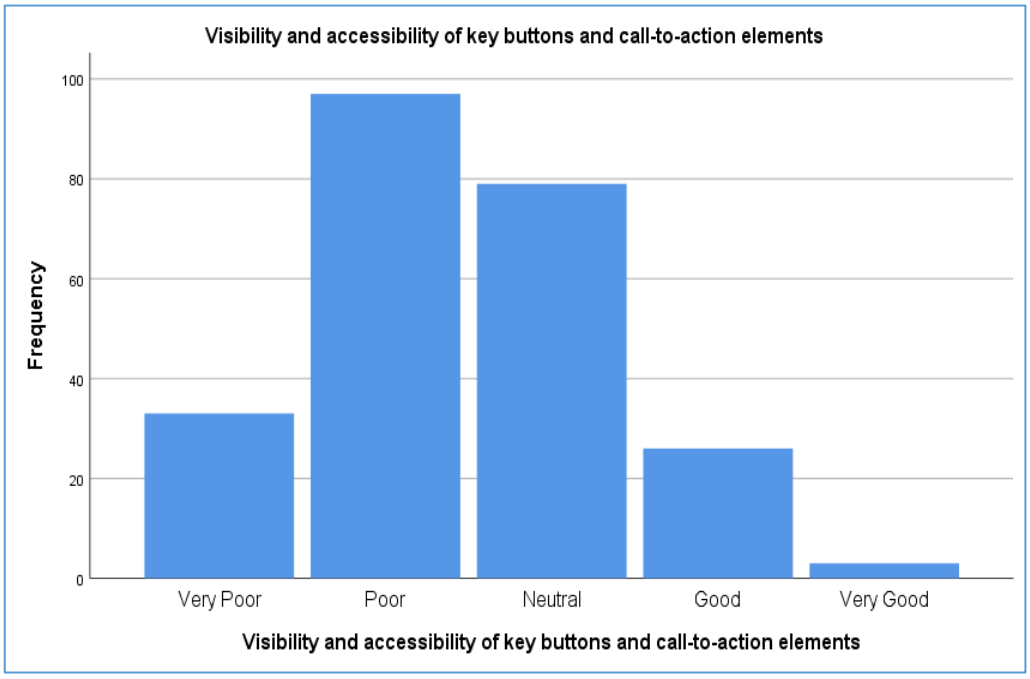


Graph 6: Graphical representation of rating the clarity of the website's navigation menus (Source: Author)

Visibility and accessibility of key buttons and call-to-action elements					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Poor	33	13.9	13.9	13.9
	Poor	97	40.8	40.8	54.6
	Neutral	79	33.2	33.2	87.8
	Good	26	10.9	10.9	98.7
	Very Good	3	1.3	1.3	100.0
	Total	238	100.0	100.0	

Table 8: Frequency table of visibility & accessibility of key buttons, call-to- action (Source: Author)

The visibility and accessibility of key buttons and call-to-action elements were predominantly rated as poor (40.8%) or neutral (33.2%) by the participants, with only a small percentage rating them as very good (1.3%).

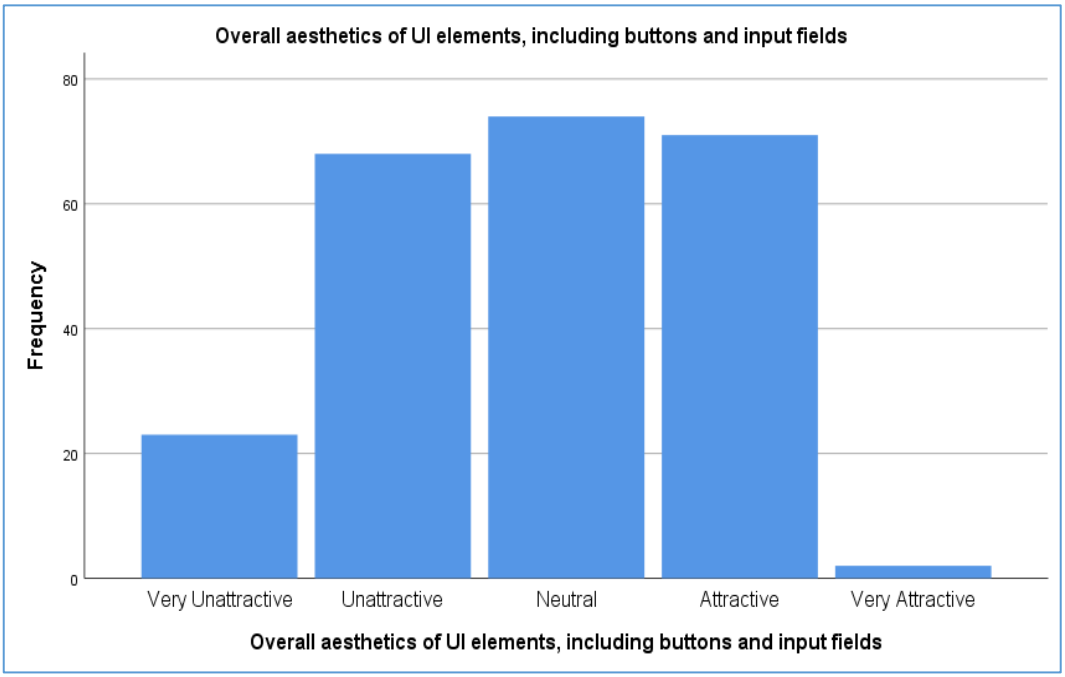


Graph 7: Graphical representation of visibility & accessibility of key buttons and call-to-action elements
(Source: Author)

Overall aesthetics of UI elements, including buttons and input fields					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unattractive	23	9.7	9.7	9.7
	Unattractive	68	28.6	28.6	38.2
	Neutral	74	31.1	31.1	69.3
	Attractive	71	29.8	29.8	99.2
	Very Attractive	2	.8	.8	100.0
	Total	238	100.0	100.0	

Table 9: Frequency table of overall aesthetics of UI elements, buttons and input fields
(Source: Author)

The aesthetics of UI elements, including buttons and input fields, were perceived as unattractive by 28.6% of participants, neutral by 31.1%, and attractive by 29.8%. A small percentage found them very attractive (8.0%).

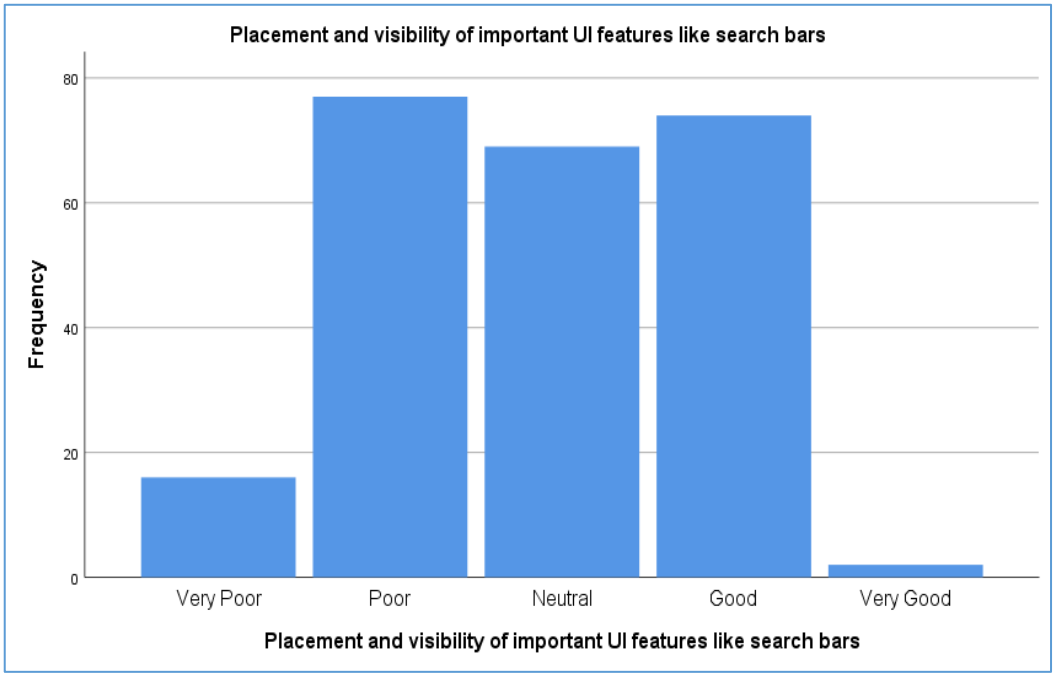


Graph 8: Graphical representation of overall aesthetics of UI elements, including buttons and input fields
(Source: Author)

Placement and visibility of important UI features like search bars					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Poor	16	6.7	6.7	6.7
	Poor	77	32.4	32.4	39.1
	Neutral	69	29.0	29.0	68.1
	Good	74	31.1	31.1	99.2
	Very Good	2	.8	.8	100.0
	Total	238	100.0	100.0	

Table 10: Frequency table of placement & visibility of important UI features, search bars
(Source: Author)

Participants' views on the placement and visibility of search bars vary. About 39.1% rated it poorly, while 68.1% were neutral. On the other hand, 31.9% rated it positively, considering it good or very good.

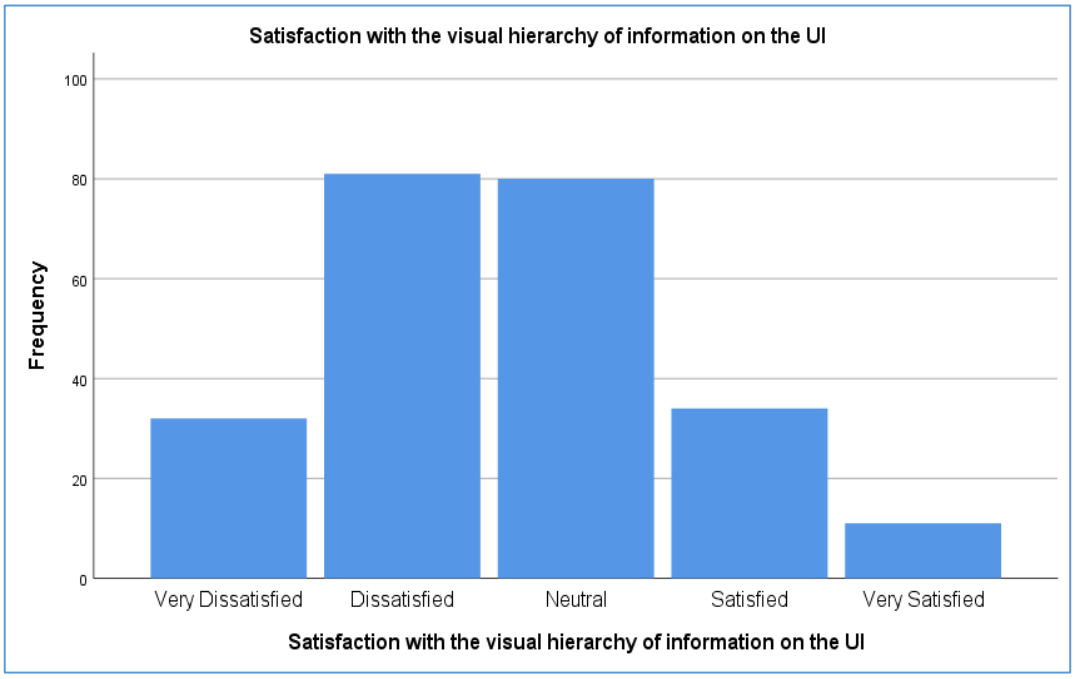


Graph 9: Graphical representation of placement and visibility of important UI features like search bars
(Source: Author)

Satisfaction with the visual hierarchy of information on the UI					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	32	13.4	13.4	13.4
	Dissatisfied	81	34.0	34.0	47.5
	Neutral	80	33.6	33.6	81.1
	Satisfied	34	14.3	14.3	95.4
	Very Satisfied	11	4.6	4.6	100.0
	Total	238	100.0	100.0	

Table 11: Frequency table of satisfaction with visual hierarchy of information on the UI
(Source: Author)

Satisfaction with the visual hierarchy of information on the user interface varied, with 34.0% of participants being dissatisfied and 33.6% neutral. Smaller percentages were very satisfied (4.6%) or satisfied (14.3%).

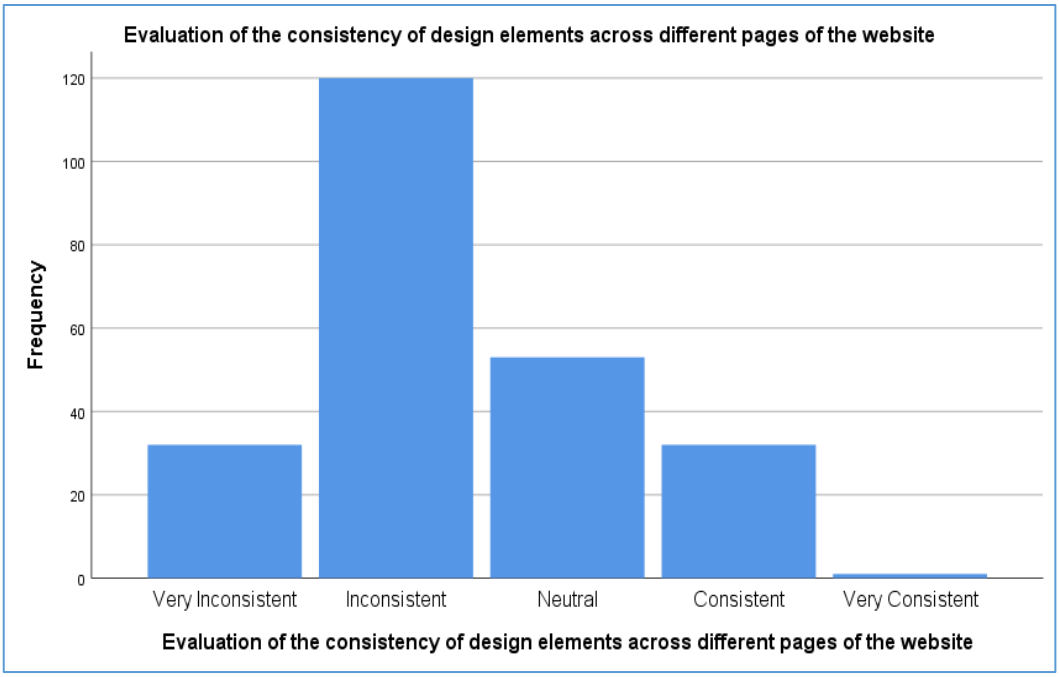


Graph 10: Graphical representation of satisfaction with the visual hierarchy of information on the UI
(Source: Author)

Evaluation of consistency of design elements across different pages of website					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Inconsistent	32	13.4	13.4	13.4
	Inconsistent	120	50.4	50.4	63.9
	Neutral	53	22.3	22.3	86.1
	Consistent	32	13.4	13.4	99.6
	Very Consistent	1	.4	.4	100.0
	Total	238	100.0	100.0	

Table 12: Frequency table of evaluation of the consistency of design elements across different pages of the website
(Source: Author)

Participants' evaluation of the consistency of design elements across different pages of the website showed that 50.4% found them inconsistent, while 13.4% found them very inconsistent. A smaller percentage found them consistent (13.4%) or very consistent (4.0%).

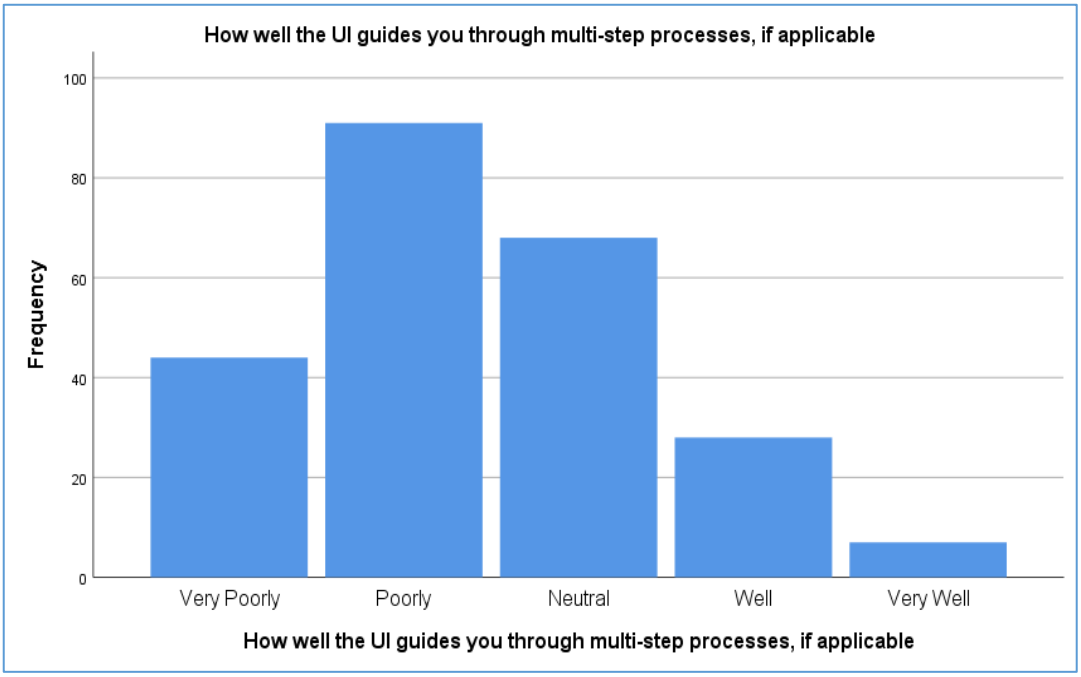


Graph 11: Graphical representation of evaluation of the consistency of design elements across different pages of the website
(Source: Author)

How well the UI guides you through multi-step processes, if applicable					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Poorly	44	18.5	18.5	18.5
	Poorly	91	38.2	38.2	56.7
	Neutral	68	28.6	28.6	85.3
	Well	28	11.8	11.8	97.1
	Very Well	7	2.9	2.9	100.0
	Total	238	100.0	100.0	

Table 13: Frequency table of how well UI guide through multi-step processes
(Source: Author)

The guidance provided by the user interface through multi-step processes was rated poorly by 38.2% of participants and neutrally by 28.6%. A smaller percentage found the guidance very poorly (18.5%) or very well (2.9%).



Graph 12: Graphical representation of how well the UI guides you through multi-step processes, if applicable

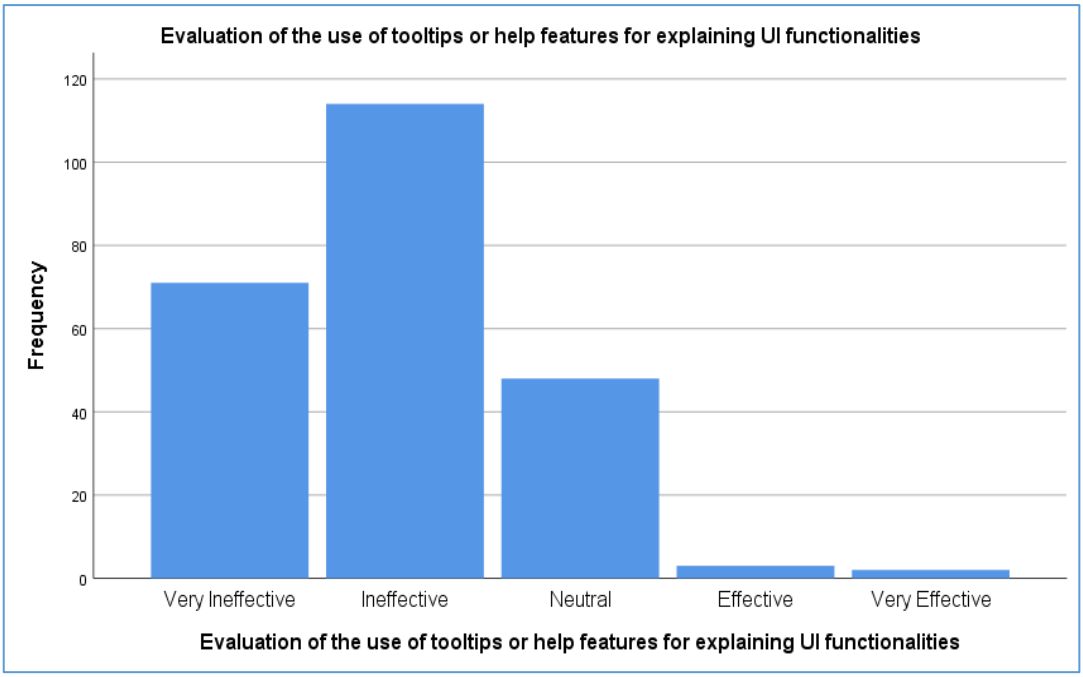
(Source: Author)

Evaluation of use of tooltips or help features for explaining UI functionalities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Ineffective	71	29.8	29.8	29.8
	Ineffective	114	47.9	47.9	77.7
	Neutral	48	20.2	20.2	97.9
	Effective	3	1.3	1.3	99.2
	Very Effective	2	.8	.8	100.0
	Total	238	100.0	100.0	

Table 14: Table 14: Frequency table of evaluation of the use of tooltips or help features for explaining UI functionalities

(Source: Author)

A majority of participants, 77.7%, rated tooltips or help features as very ineffective or ineffective. About 20.2% expressed neutrality. Only a small fraction, 2.1%, found them effective or very effective.



Graph 13: Graphical representation of evaluation of the use of tooltips or help features for explaining UI functionalities
(Source: Author)

4.2 Data Analysis

In the data analysis section of the thesis, using SPSS software several statistical analyses involving descriptive analysis to reveal the mean of the overall responses of the participant, regression modeling, and ANOVA testing were employed to explore the relationships between various user interface (UI) aspects and user satisfaction with web-based information systems tailored for tourists visiting Nepal. These statistical techniques serve as fundamental tools for understanding the interplay between different UI elements and their impact on user experience.

Through regression modeling, the objective was to identify significant predictors among the UI aspects that influence user satisfaction with website design. This analysis aimed to pinpoint which elements carry the most weight in shaping

user experience, providing valuable insights for optimization. The R Square value derived from the regression analysis offers a quantification of the proportion of variability in user satisfaction explained by the UI aspects, thereby gauging the strength of the relationship between the variables under study.

ANOVA testing was conducted to evaluate the significance of the regression model, determining whether the collective UI aspects contribute meaningfully to explaining user satisfaction with website design. A significant model suggests that the included factors adequately explain the variability in user satisfaction, offering confidence in the model's predictive capabilities.

Overall, the findings derived from these analyses offer actionable insights for optimizing UI design elements to enhance user satisfaction and improve overall website design quality. By discerning the factors that exert the most influence on user experience, designers can make informed decisions to create more user-friendly web-based information systems. Moreover, researcher pinpoints that regression and ANOVA testing are influential in examining a variable's impact, strength and association. Thus, these statistical analyses played a key role in drawing conclusions as well as determining the main findings of the research. The adoption of both mixed method designs permitted for an in-depth exploration of the multi-layered aspects of web-based information system for tourists in Nepal enriching the breadth and depth of the study findings.

4.2.1 Regression Analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.857[a]	.735	.724	.474

Table 15: Regression Model

(Source: Author)

The regression model summary shows an R Square value of 0.735, meaning that approximately 73.5% of the variability in the dependent variable, which is "Satisfaction with the overall user interface design of the website," can be explained by the independent variables (UI Aspects variables). This high R Square

value suggests a strong relationship between the UI aspects and user satisfaction with the website design.

4.2.2 ANOVA Testing

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	141.780	9	15.753	70.131	.000[b]
	Residual	51.215	228	.225		
	Total	192.996	237			

Table 16: ANOVA test

(Source: Author)

a. Dependent Variable: Satisfaction with the overall user interface design of the website
b. Predictors: (Constant), UI Aspects variables

Furthermore, the ANOVA results reveal a significant regression model, with a low p-value of .000, indicating that the regression model is a good fit for the data. The F-statistic of 70.131 further supports this, suggesting a strong relationship between the independent variables (UI Aspects) and the dependent variable (Satisfaction with website design). Overall, these results highlight that the UI aspects play a crucial role in influencing users' satisfaction with the overall design of a website.

In summary, the key findings from the regression analysis are: A high R Square value of 0.735 indicates that UI aspects explain approximately 73.5% of the variability in user satisfaction with website design. The regression model is statistically significant, as evidenced by a low p-value of .000. The F-statistic of 70.131 suggests a strong relationship between UI aspects and user satisfaction with website design. These results underscore the importance of considering and optimizing UI aspects to enhance user satisfaction and overall website design quality.

4.3 Prototypes – UML Diagrams

4.3.1 Data Dictionary

Class Name	Description
Person	This is the base class for all users interacting with the system: Admin, Customer, and TourGuide. It has attributes common to all users and defines methods for logging in and out.
Admin	Inherits from Person. Represents someone with administrative privileges for managing the system, including potentially confirming payments and updating their dashboard (not explicitly shown).
Customer	Inherits from Person. Represents a customer making a hotel reservation. Inherits login and logout functionalities from Person. It also allows customers to book services, make payments, edit profiles, and give feedback.
TourGuide	Inherits from Person. Might not be directly relevant to core functionalities. It includes attributes specific to tour guides, like the languages they speak.
Booking	Represents a reservation made by a customer. It stores details like unique identifier, service name (e.g., room), and description (e.g., room type).
Payment	Represents a payment made by a customer. It stores the total amount paid and has a method to generate a payment receipt.
Hotel	Represents the hotel itself. It stores the hotel's name, location, and the number of rooms available.

4.3.2 Class Diagram

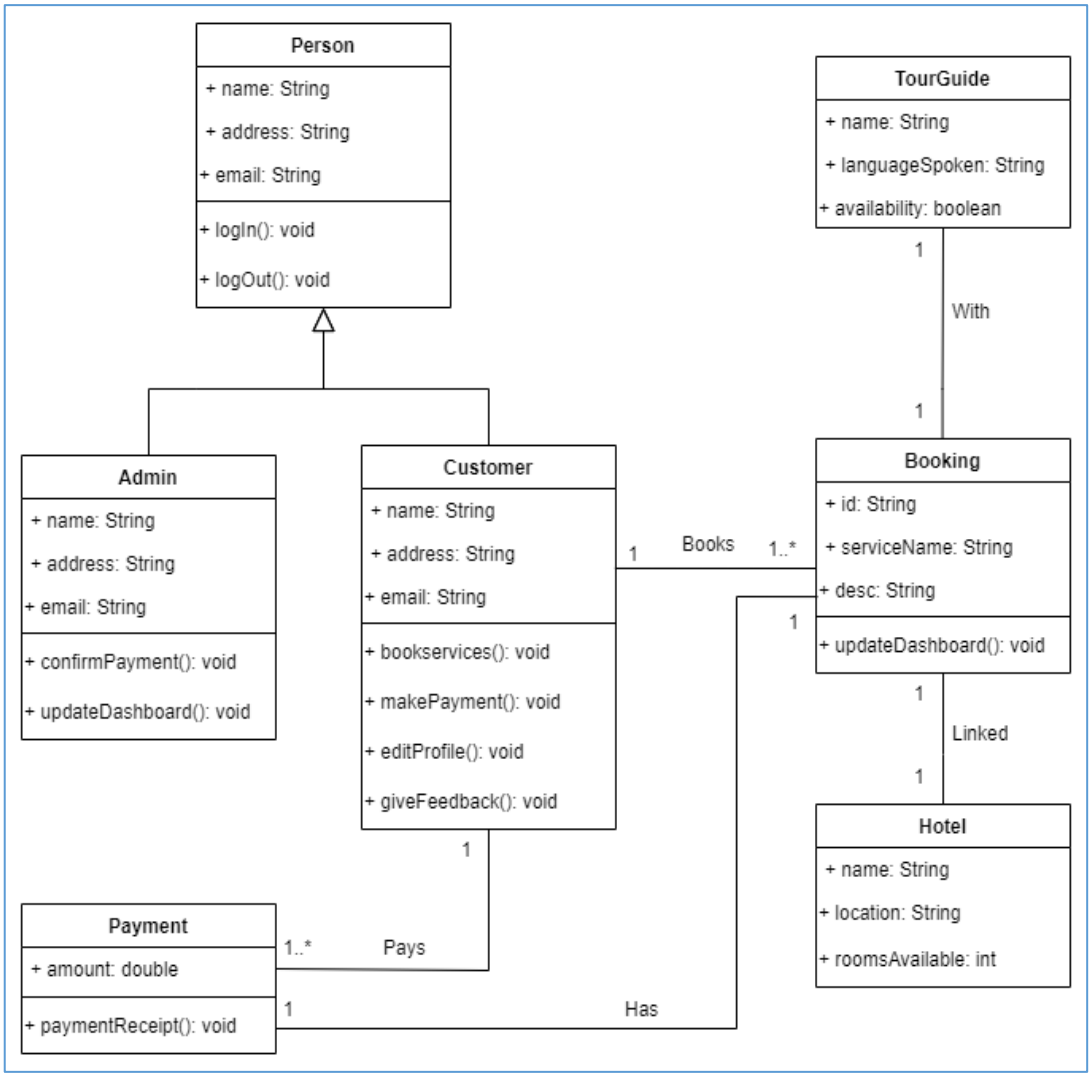


Figure 18: Class Diagram

(Source: Author)

Person Class: The Person class serves as a base class for other entities in the system. It encapsulates common attributes such as name, address, and email. These attributes are essential for identifying and interacting with individuals within the system. The login() and logOut() methods allow instances of this class to manage authentication and session-related functionality.

Admin Class (Inherits from Person): The Admin class represents administrative users. It inherits attributes from the Person class, including name, address, and email. Admins have additional responsibilities, such as confirming

payments (confirmPayment()) and updating the system dashboard (updateDashboard()). They play a crucial role in managing system operations.

Customer Class (Inherits from Person): The Customer class also inherits from Person. Customers are end-users of the system. They have their own set of attributes (name, address, and email). Customers can perform various actions:

- The bookServices() method allows customers to reserve services (e.g., hotel rooms, tours).
- Customers can make payments using the makePayment() method.
- The editProfile() method enables customers to update their profile information.
- Customers can give feedback through the giveFeedback() method.

Relationships: Customer class is associated with Booking through a "Books" relationship (multiplicity: one-to-many). A customer can create multiple bookings. Customer class is also linked with Payment through a "Pays" relationship (multiplicity: one-to-many). A customer can make multiple payments.

Payment Class: The Payment class represents financial transactions. It's primary attribute is amount, which stores the payment value (e.g., the cost of a booking). The paymentReceipt() method generates a receipt for completed payments.

TourGuide Class (Inherits from Person): Tour guides inherit from the Person class. They possess additional attributes: name: the guide's name, languageSpoken: the languages the guide can communicate in, availability: a boolean indicating whether the guide is available for tours. It is associated with Booking via a "With" relationship (multiplicity: many-to-many). A tour guide can be assigned to multiple bookings, and a booking can have multiple tour guides.

Booking Class: The Booking class represents reservations made by customers. It has the following attributes: id: A unique identifier for each booking,

serviceName: Describes the type of service booked (e.g., hotel room, tour), desc: Additional information or description related to the booking. The updateDashboard() method allows the system to refresh the booking-related dashboard. This class is linked to Hotel via an unnamed relationship (multiplicity: many-to-one). Multiple bookings can be associated with a single hotel.

Hotel Class: The Hotel class represents accommodation facilities. It includes the following attributes: name: the hotel's name, location: describes the geographical location of the hotel, roomsAvailable: an integer indicating the number of available rooms in the hotel.

4.3.3 Use Case Diagram

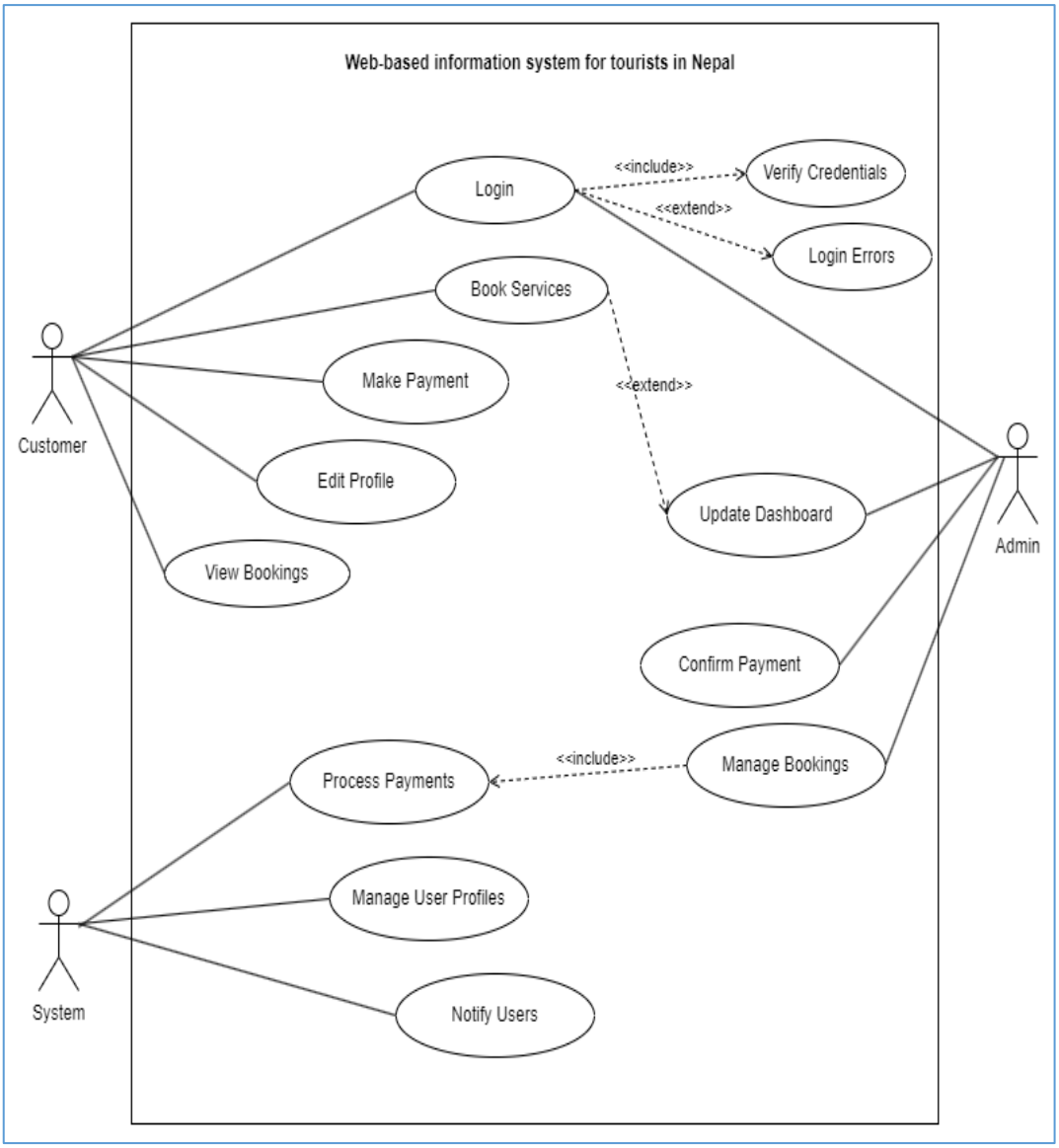


Figure 19: Usecase Diagram

(Source: Author)

The use case diagram outlines the interactions within a web-based information system designed specifically for tourists visiting Nepal. In this system, various actors such as customers, administrators (admin), and the system interact to provide essential services and information to tourists.

Actor Customer: represents tourists who use the system. Customers can perform several actions:

- **Login:** This use case involves verifying user credentials to grant access to the system. It includes interactions such as validating usernames and passwords. If login errors occur (e.g., incorrect password or a locked account), the system handles them.
- **Book Services:** Customers can reserve various services, such as hotel rooms, guided tours, or transportation.
- **Make Payment:** Initiates payment for booked services. This use case extends to a step where payment confirmation is required.
- **Edit Profile:** Allows customers to update their personal information, preferences, or contact details.
- **View Bookings:** Displays information about existing bookings made by the customer.

Actor Admin: represents system administrators responsible for managing system operations. Admins have specific tasks:

- **Update Dashboard:** Admins maintain and update the system dashboard, ensuring that relevant information is displayed for both customers and other admins.
- **Manage Bookings:** This use case involves handling booking-related tasks, such as approving reservations, modifying bookings, or resolving issues.

Actor System: represents the underlying software system itself. It manages the entire process.

- **Process Payments:** The system manages financial transactions related to bookings and services. This includes handling payment gateways,

confirming successful payments, and generating receipts. Additionally, the system manages user profiles associated with payment methods.

- **Notifies Users:** The system sends notifications to users (both customers and admins) regarding booking confirmations, payment status, or any relevant updates.

4.3.4 Activity Diagram – Login

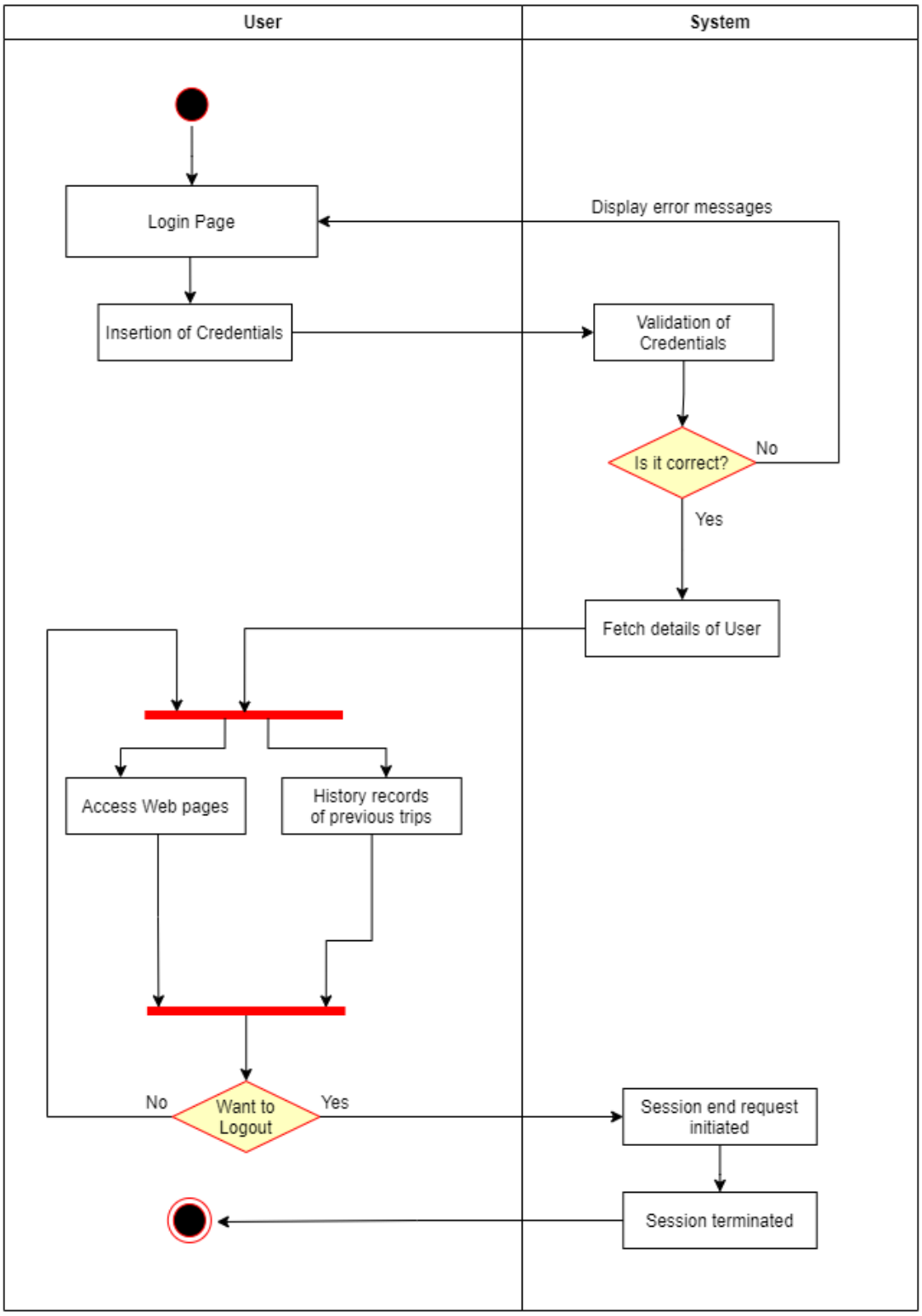


Figure 20: Activity Diagram – Login

(Source: Author)

The activity diagram for web-based information system designed for tourists visiting Nepal depicts the process of a user interacting with a system, specifically related to logging in and accessing web pages or viewing history records of previous trips. There are two partitions, User and System. On User column, it shows login Process. Tourists initiate their interaction by accessing the Login Page. At this stage, they input their credentials, which typically consist of a username and a password.

In the System column, the system performs Validation of Credentials. If the provided credentials are correct, the system grants access to the main features. If the credentials are incorrect, the system displays relevant error messages, prompting tourists to re-enter their information. Once authenticated, tourists can explore the following functionalities. The system provides a variety of web pages relevant to Nepal and its attractions.

These pages might include information about:

- Tourist Destinations: Details about popular places to visit, such as Kathmandu, Pokhara, or Lumbini.
- Cultural Heritage: Insights into Nepal's rich cultural history, temples, and monuments.
- Natural Wonders: Descriptions of the Himalayan mountain range, national parks, and wildlife sanctuaries.
- Local Cuisine: Recommendations for trying traditional Nepali dishes.
- Travel Tips: Practical advice on transportation, safety, and local customs.

Tourists can access their personal trip history within the system. This feature allows them to review past journeys, including dates when they visited Nepal, places visited like specific cities, towns, or regions, activities like trekking, sightseeing, cultural experiences, etc, details about hotels, guesthouses, or homestays. At last, to conclude their session, tourists have the option to log out. Choosing this option ensures the system terminates their access securely.

4.3.5 Activity Diagram – Book Tour

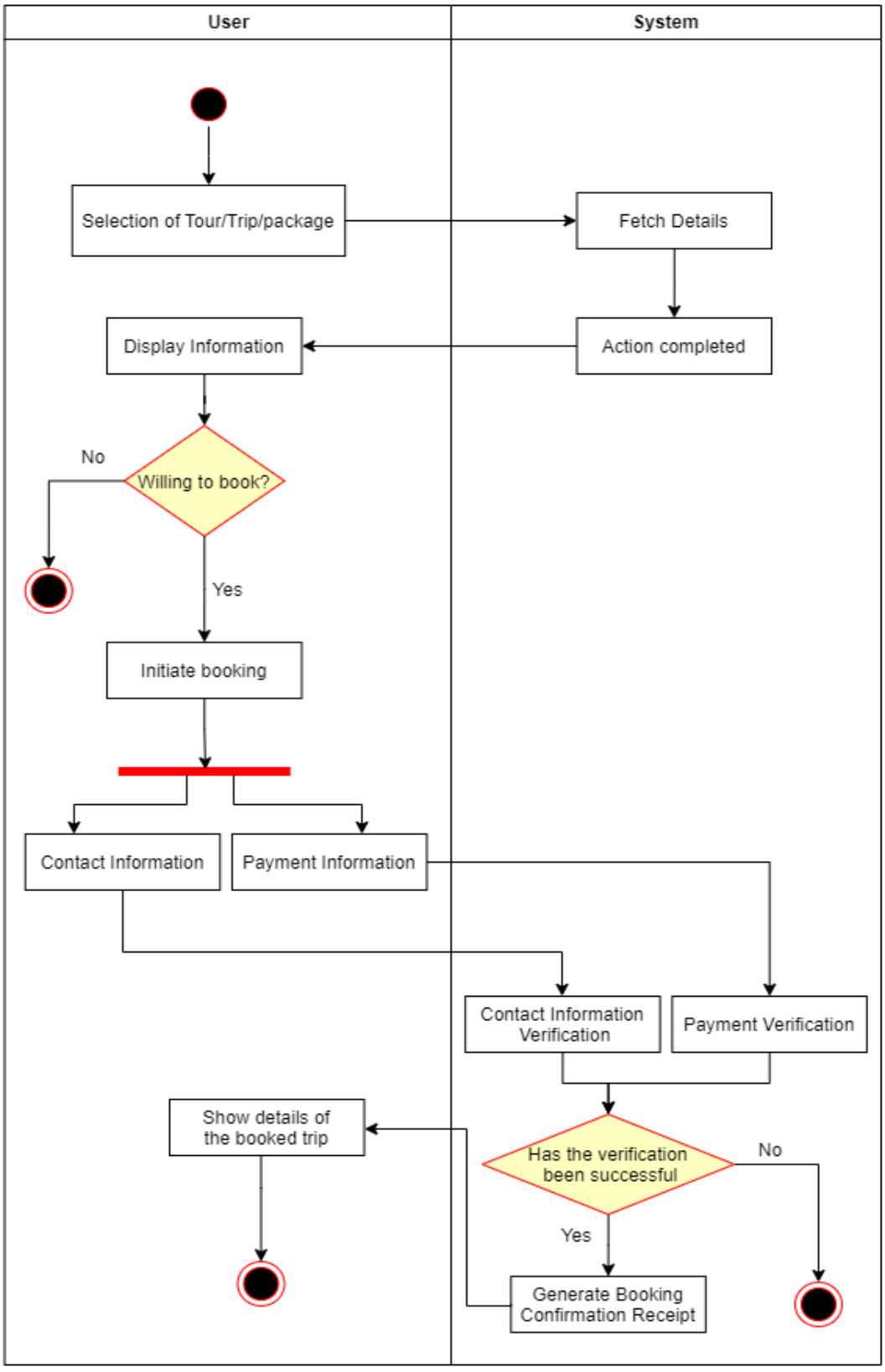


Figure 21: Activity Diagram – Book tour

(Source: Author)

This activity diagram outlines the steps involved in selecting, booking, and verifying a tourist experience in Nepal through a web-based system The diagram begins with the User selecting a Tour, Trip, or Package. This initial choice determines the type of experience they wish to explore in Nepal. The system responds by fetching relevant details based on the user's selection. These details could include information about destinations, itineraries, accommodations, and activities.

Once the system completes the data retrieval (indicated by "Action completed"), the user has a clearer understanding of what the chosen tour or trip entails. The key decision point arises: "Is the user willing to book?" If the user chooses not to book, the process ends here. They can continue exploring other options or exit the system. If the user is interested in booking, they proceed to the next steps. The user initiates the booking process by selecting the "Initiate booking" option. They provide essential information:

- Contact Information: Details like name, email address, and phone number.
- Payment Information: Payment method, credit card details, or any other relevant payment specifics.

Verification Steps: The system performs two critical verifications: Contact Information Verification: Ensures that the provided contact details are accurate and valid. If successful, the system proceeds. If not, the user may need to correct or update their contact information. Payment Verification: Validates the payment details. If the payment information is correct, the system moves forward. If there are issues (such as insufficient funds or incorrect card details), the user receives appropriate feedback. The final decision point asks, "Has the verification been successful?" If successful, the system generates a Booking Confirmation Receipt. This receipt includes essential details: Booking ID: A unique identifier for the reservation. Tour/Package Details: Specifics about the chosen experience. Payment Summary: Amount paid, payment method, and transaction timestamp. If the verification fails, the process ends, and the user may need to review their information or choose an alternative payment method.

4.4 Low Fidelity Wireframes

4.4.1 SignUp Page

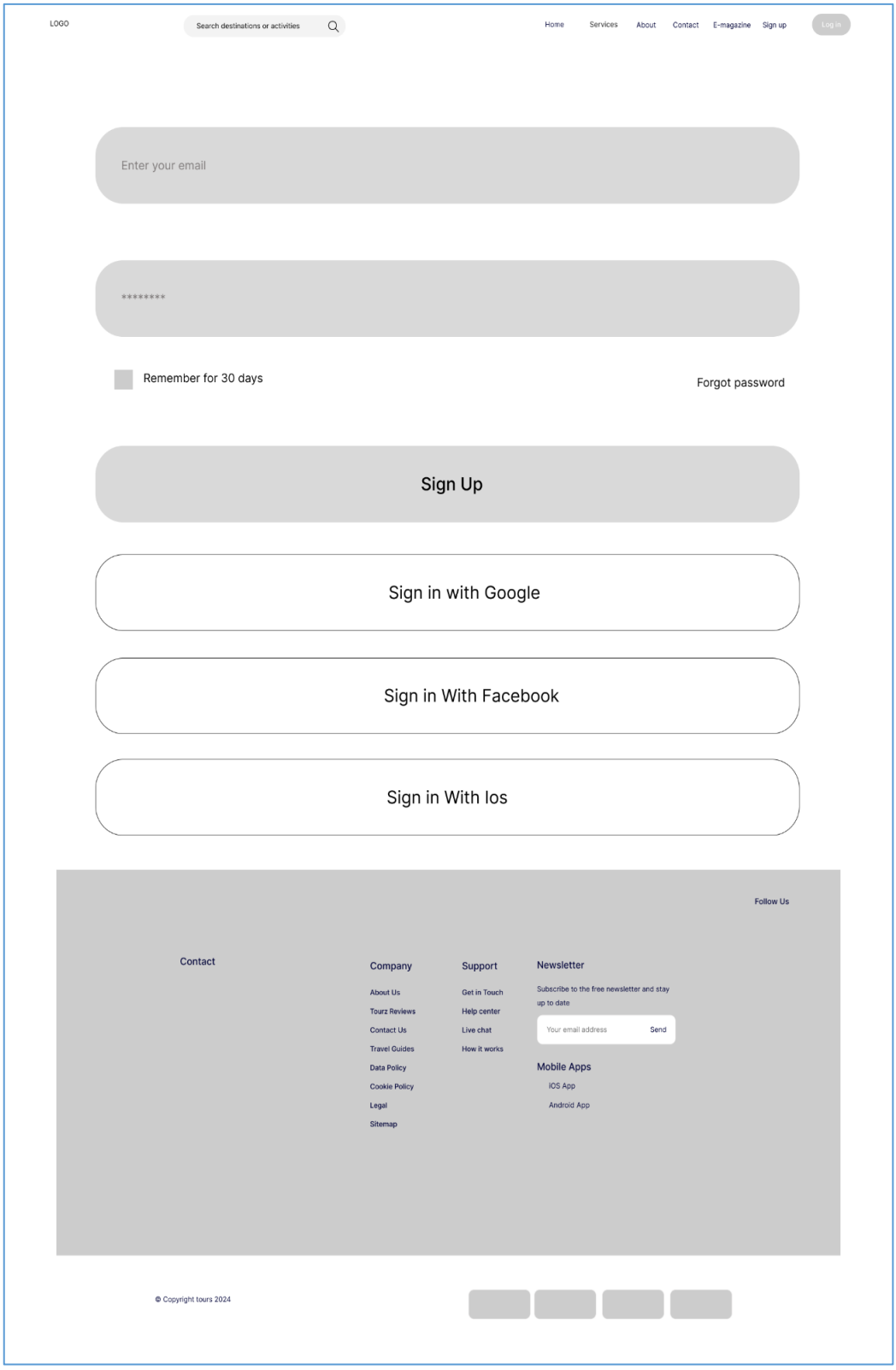


Figure 22: Signup Page

(Source: Author)

4.4.2 Login Page

Figure 23: Login Page

(Source: Author)

4.4.3 Service Booking

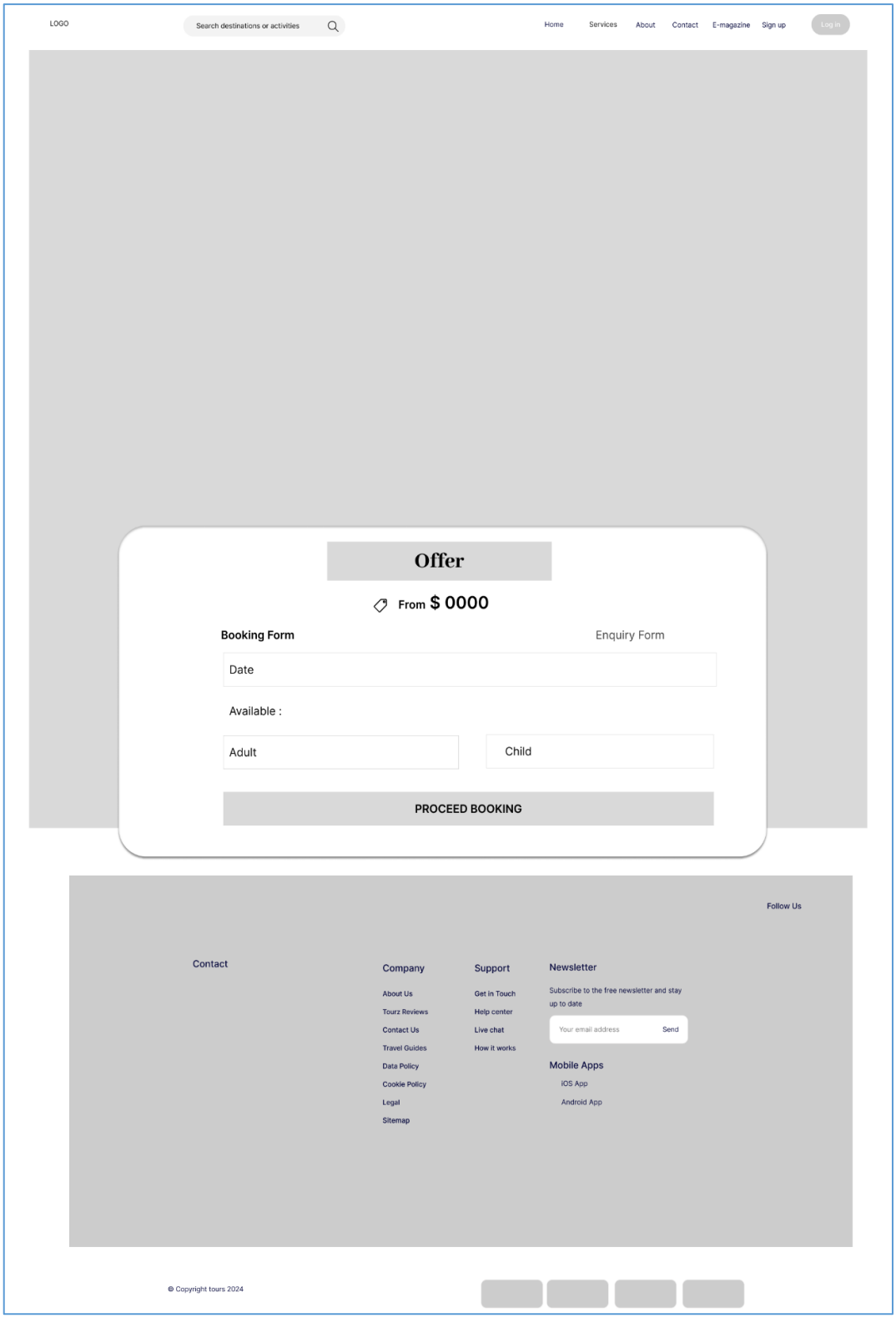


Figure 24: Service Booking

(Source: Author)

4.4.4 Book Tour

Figure 25: Book Tour

(Source: Author)

4.4.5 Landing Page

Figure 26: Landing Page

(Source: Author)

4.5 High Fidelity Wireframes (Proposed UI designs)

4.5.1 Signup Page

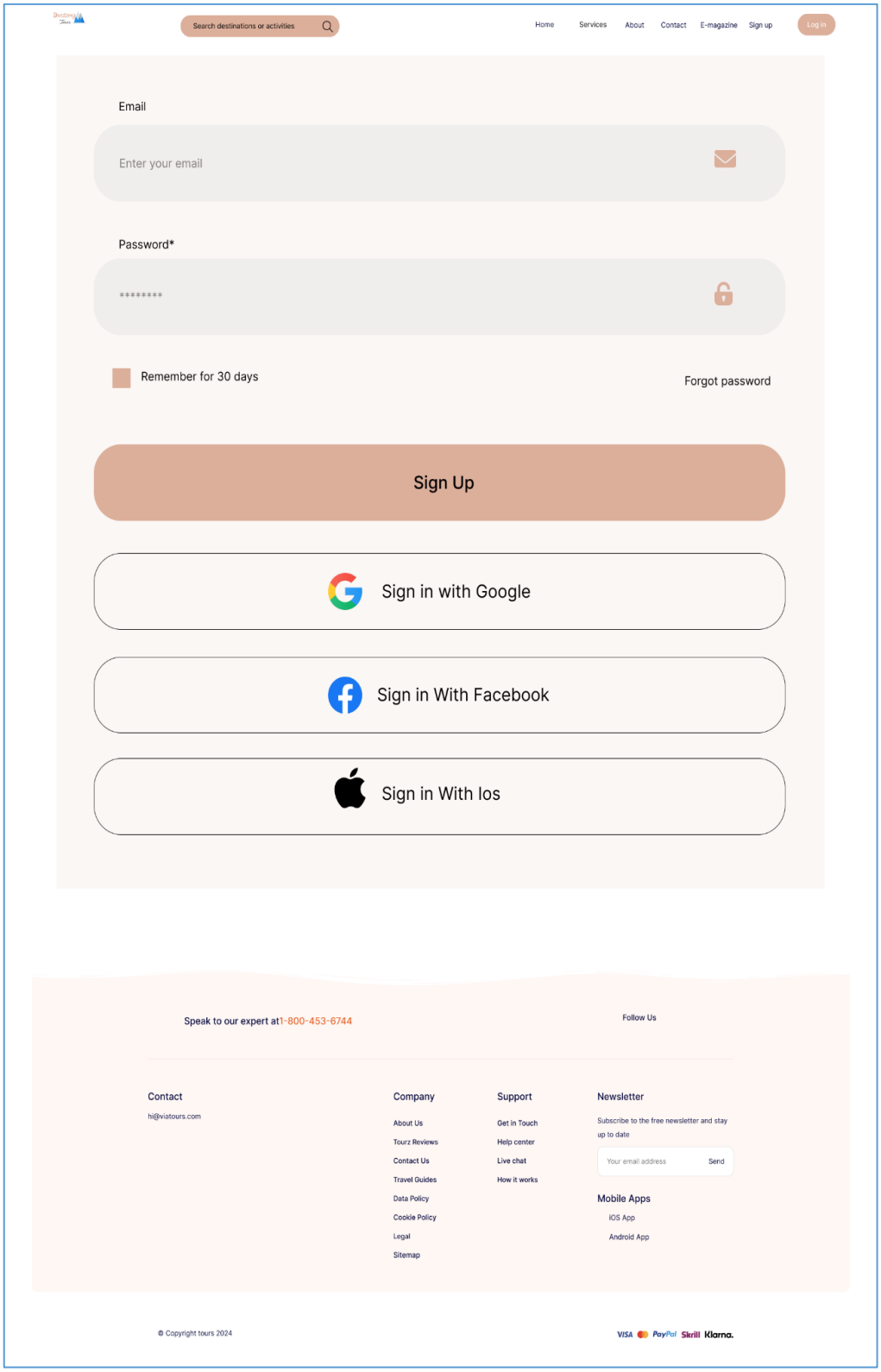


Figure 27: Signup Page

(Source: Author)

4.5.2 Login Page

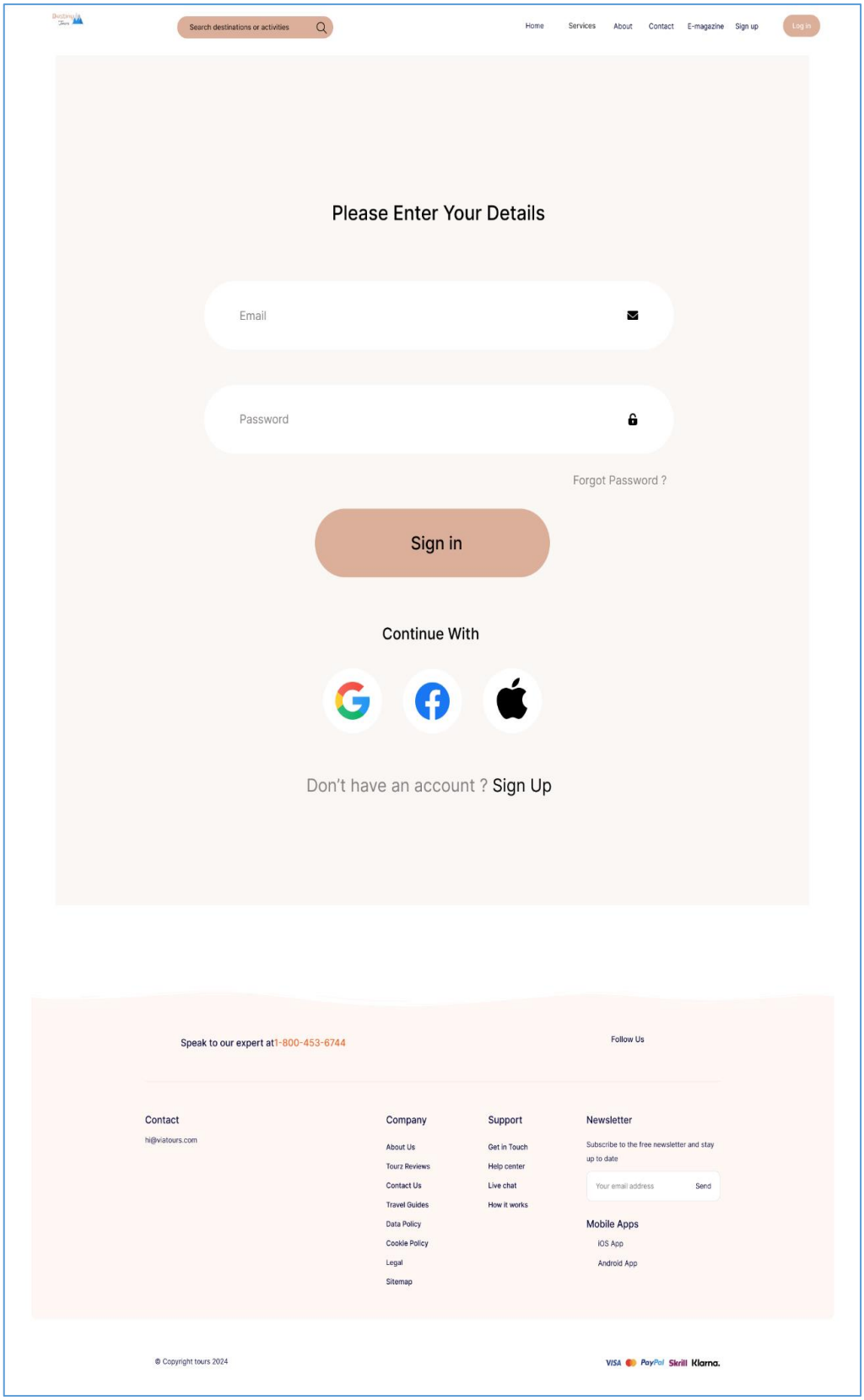


Figure 28: Login Page

(Source: Author)

4.5.3 Service Booking

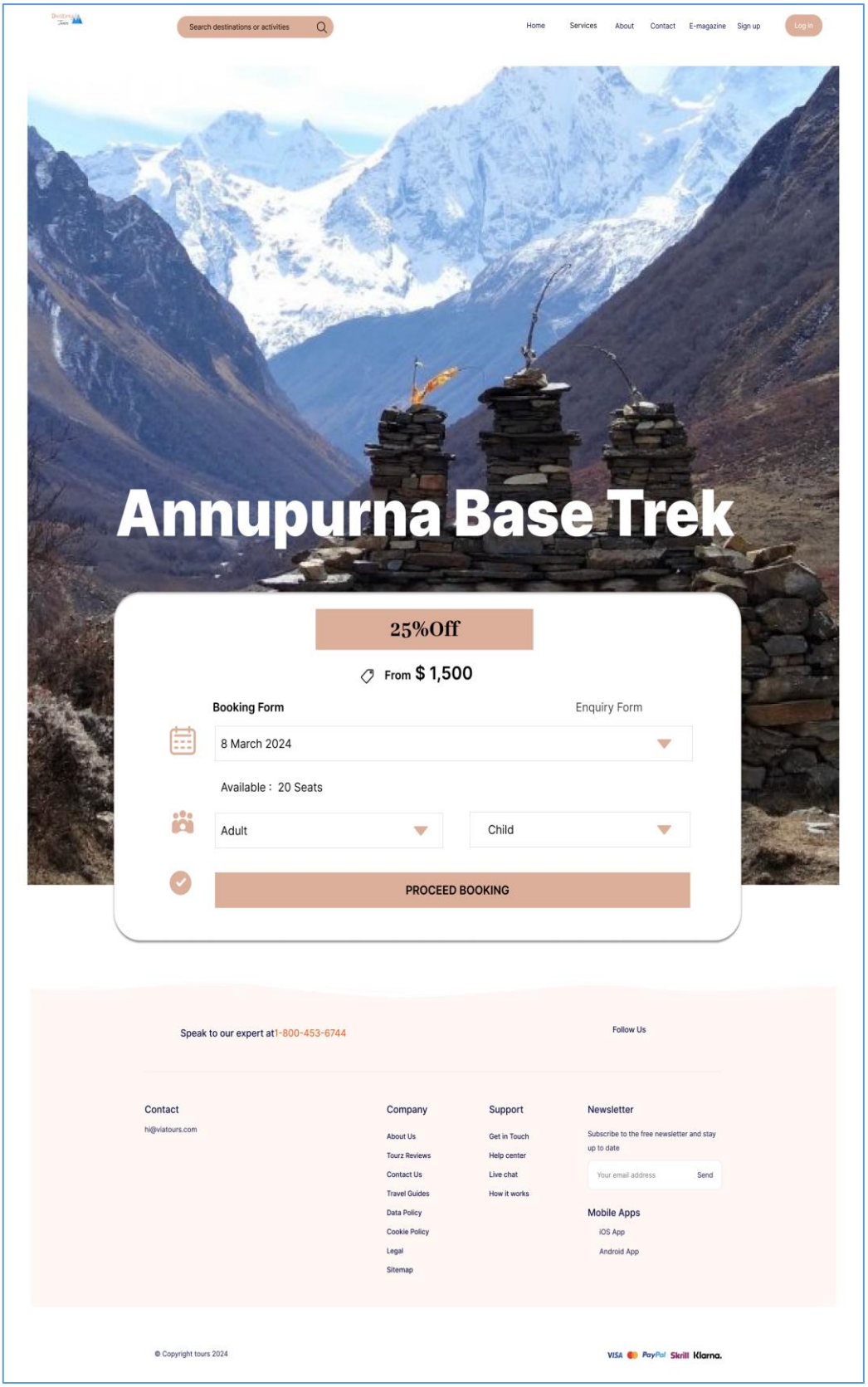


Figure 29: Service Booking

(Source: Author)

4.5.4 Book Tour

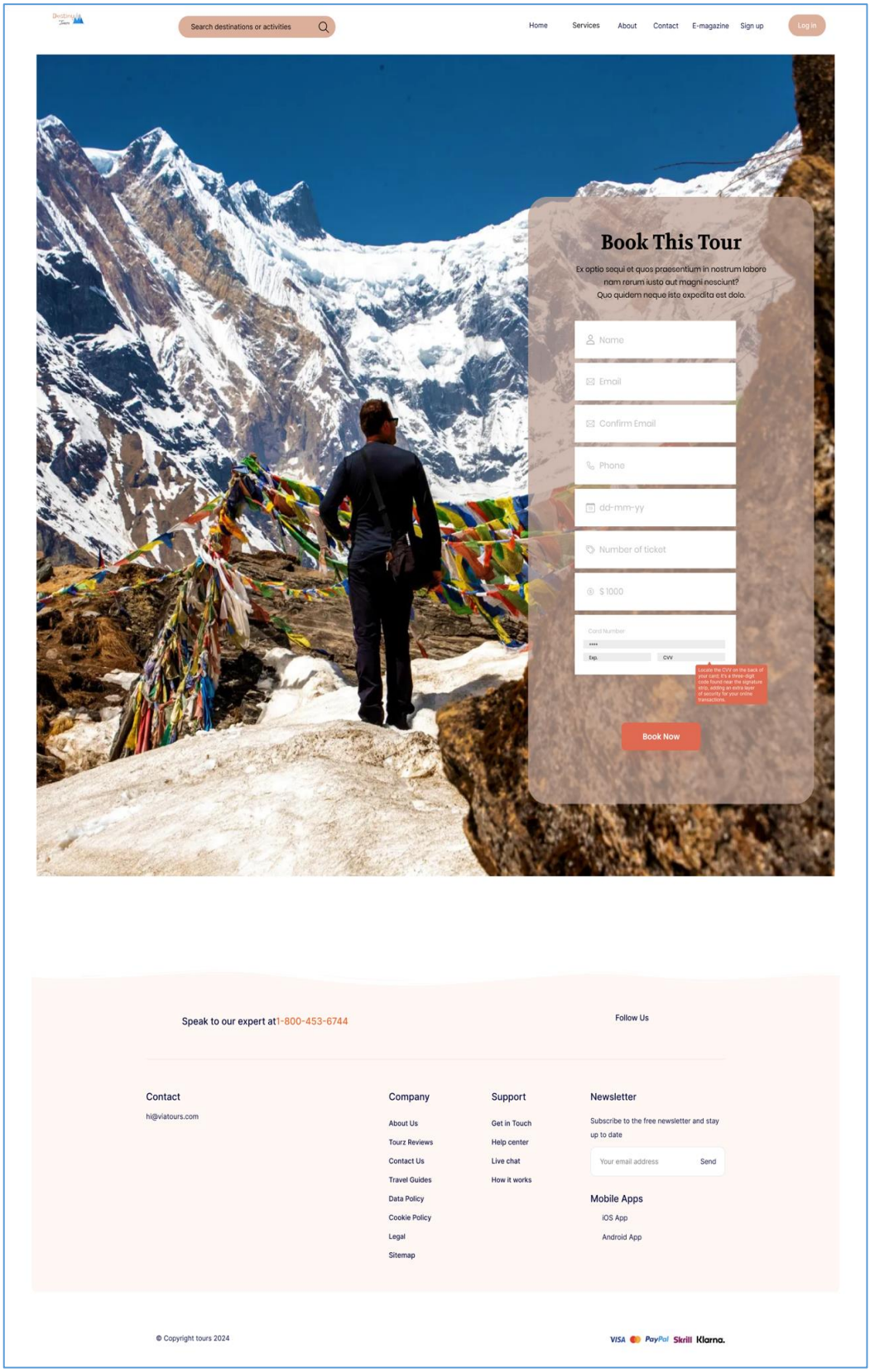


Figure 30: Book Tour

(Source: Author)

4.5.5 Landing Page

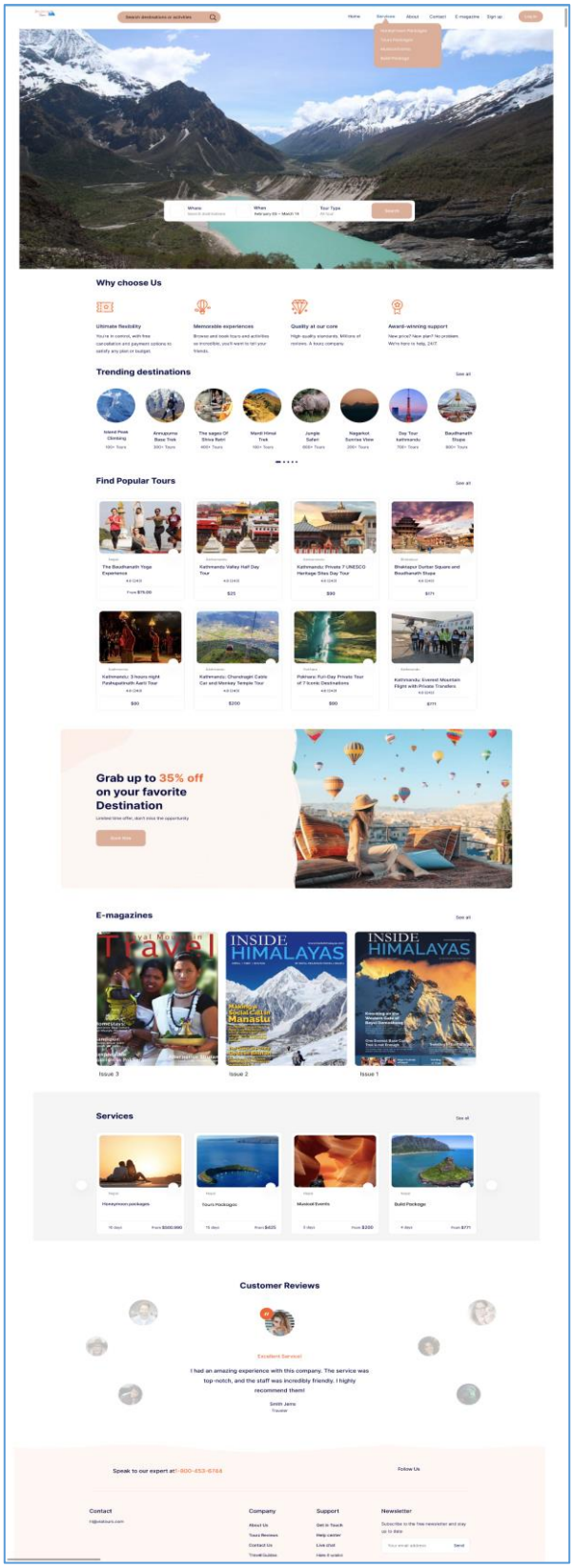


Figure 31: Landing Page

(Source: Author)

4.6 Description of new proposed UI designs

The new design appears clean and organized, with clear sections and easily identifiable elements. The layout is visually appealing and user-friendly. The color scheme is pleasing, utilizing a mix of neutral tones and vibrant colors. The contrast between different elements enhances readability and aesthetics. The navigation bar at the top provides clear links to essential sections like “Home,” “About Us,” and “Tours.”

Users should find it easy to explore different parts of the website. Important elements such as popular tours and customer reviews are prominently displayed. The offer banner (“Up to 35% off”) stands out due to its contrasting color. The aesthetics are modern and appealing, incorporating high-quality images and a balanced layout. The background photo showcasing Nepal’s scenic beauty adds to the overall appeal. Key features are centrally placed on the page, ensuring visibility and accessibility.

The “Why Choose Us” section with service icons is strategically positioned. Different content sections are separated distinctly, creating a clear visual hierarchy. Important information is highlighted effectively. Design elements (fonts, icons, spacing) appear consistent throughout the page. This contributes to a cohesive and professional look. Attention has been made to streamline multi-step processes for user convenience based on the overall design quality. Tooltips or help features has been placed on Book this tour page, where users are provided with helpful information while inserting the card details on the payment section.

Overall, the proposed UI designs address the weaknesses observed in existing systems and aim to enhance the user experience for visitors exploring Nepal’s tourism offerings.

4.7 User Satisfaction Level for new Proposed UI Designs

The survey conducted aimed to measure user satisfaction levels regarding the new proposed user interface (UI) designs for web-based information systems to tourists visiting Nepal. A total of 249 respondents participated in the survey, providing valuable feedbacks on various aspects of the proposed UI designs.

4.7.1 Descriptive Statistics of Survey of new Proposed UI designs

Descriptive Statistics				
	N	Min	Max	Mean
Satisfaction with the overall user interface design of the website	249	1	5	3.59
How well the UI guides you through multi-step processes, if applicable	249	1	5	3.42
Satisfaction with the overall color scheme used in the UI	249	1	5	3.31
Rating the clarity of the website's navigation menus	249	1	5	3.65
Visibility and accessibility of key buttons and call-to-action elements	249	1	5	3.47
Overall aesthetics of UI elements, including buttons and input fields	249	2	5	3.61
Placement and visibility of important UI features like search bars	249	1	5	3.38
Satisfaction with the visual hierarchy of information on the UI	249	1	5	3.45
Evaluation of the consistency of design elements across different pages of the website	249	1	5	3.50
Evaluation of the use of tooltips or help features for explaining UI functionalities	249	1	5	3.61
Valid N (listwise)	249			

Table 17: Descriptive Statistics of Survey of new Proposed UI designs

(Source: Author)

Satisfaction with the Overall User Interface Design: The mean satisfaction score for the overall user interface design of the website is 3.59 out of 5. This indicates a moderate to high level of satisfaction among respondents with the proposed UI design.

How Well the UI Guides Users through Multi-step Processes: Respondents rated the UI's effectiveness in guiding them through multi-step processes with a mean score of 3.42 out of 5, indicating a moderate level of satisfaction in this aspect.

Satisfaction with the Overall Color Scheme: The satisfaction level with the overall color scheme used in the UI received a mean score of 3.31 out of 5. While this score suggests a moderate level of satisfaction, there may be room for improvement in selecting colors that enhance user experience.

Rating the Clarity of the Website's Navigation Menus: Respondents rated the clarity of the website's navigation menus with a mean score of 3.65 out of 5, indicating a relatively high level of satisfaction in this aspect.

Visibility and Accessibility of Key Buttons and Call-to-action Elements: The mean satisfaction score for the visibility and accessibility of key buttons and call-to-action elements is 3.47 out of 5, suggesting a moderate to high level of satisfaction among respondents.

Overall Aesthetics of UI Elements: Respondents rated the overall aesthetics of UI elements, including buttons and input fields, with a mean score of 3.61 out of 5, indicating a moderate to high level of satisfaction in this aspect.

Placement and Visibility of Important UI Features like Search Bars: The mean satisfaction score for the placement and visibility of important UI features like search bars is 3.38 out of 5, suggesting a moderate level of satisfaction in this aspect.

Satisfaction with the Visual Hierarchy of Information on the UI: Respondents rated the visual hierarchy of information on the UI with a mean score of 3.45 out of 5, indicating a moderate level of satisfaction.

Evaluation of the Consistency of Design Elements across Different Pages: The mean satisfaction score for the consistency of design elements across different pages of the website is 3.50 out of 5, suggesting a moderate to high level of satisfaction in maintaining consistency throughout the UI.

Evaluation of the Use of Tooltips or Help Features for Explaining UI Functionalities: Respondents rated the use of tooltips or help features for explaining UI functionalities with a mean score of 3.61 out of 5, indicating a moderate to high level of satisfaction in providing assistance to users.

Overall, the survey results suggest a generally positive reception of the proposed UI designs for web-based information systems catering to tourists visiting Nepal.

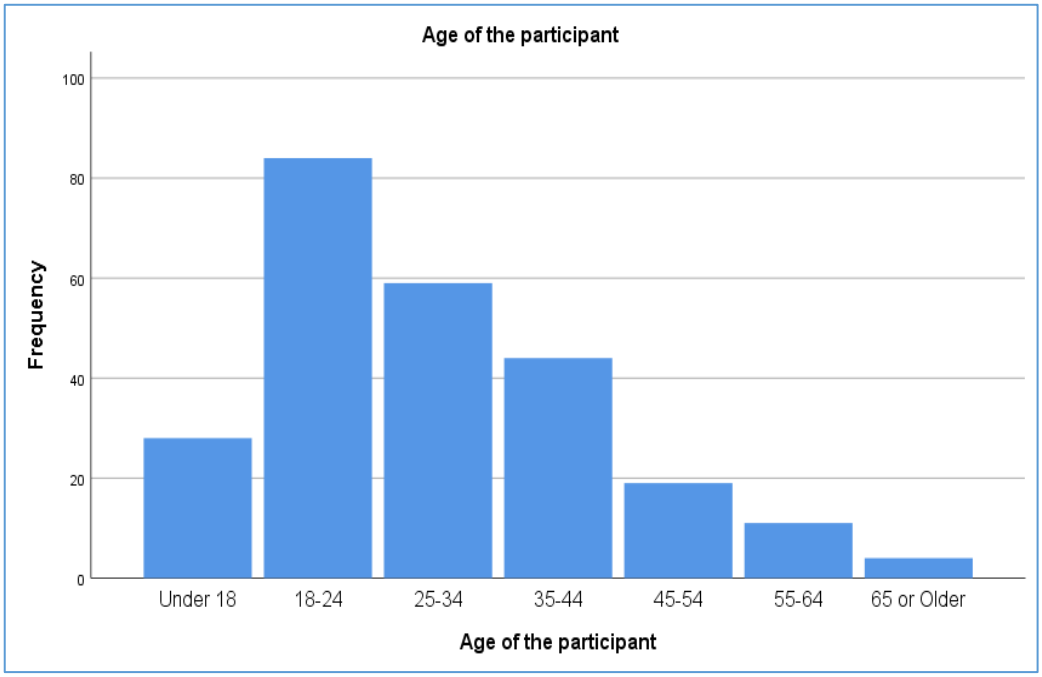
Frequency Table

Age of the participant					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 18	28	11.2	11.2	11.2
	18-24	84	33.7	33.7	45.0
	25-34	59	23.7	23.7	68.7
	35-44	44	17.7	17.7	86.3
	45-54	19	7.6	7.6	94.0
	55-64	11	4.4	4.4	98.4
	65 or Older	4	1.6	1.6	100.0
	Total	249	100.0	100.0	

Table 18: Frequency table of age of the participants

(Source: Author)

The largest age group among respondents is 18-24 years old, accounting for 33.7% of the total. The second largest group is aged 25-34, comprising 23.7% of respondents. Older age groups have fewer respondents, with only 1.6% being 65 years or older.

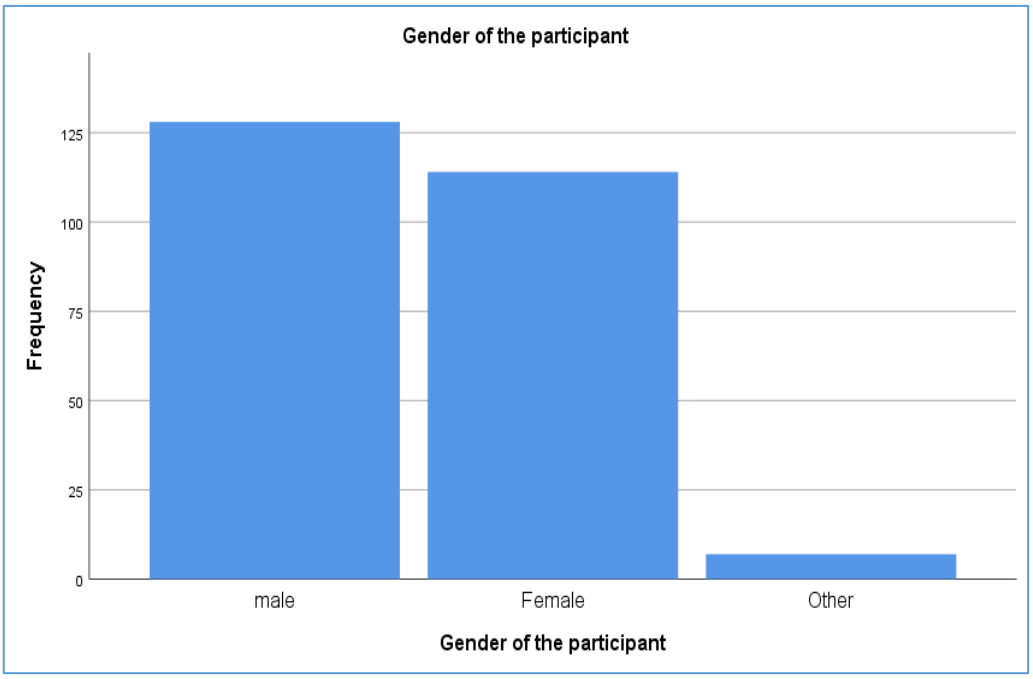


Graph 14: Graphical representation of age of the participants
(Source: Author)

Gender of the participants					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	128	51.4	51.4	51.4
	Female	114	45.8	45.8	97.2
	Other	7	2.8	2.8	100.0
	Total	249	100.0	100.0	

Table 19: Frequency table of gender of the partcipants
(Source: Author)

The majority of respondents identify as male, representing 51.4% of the total. Female respondents account for 45.8%, while a small percentage (2.8%) identify as "Other."

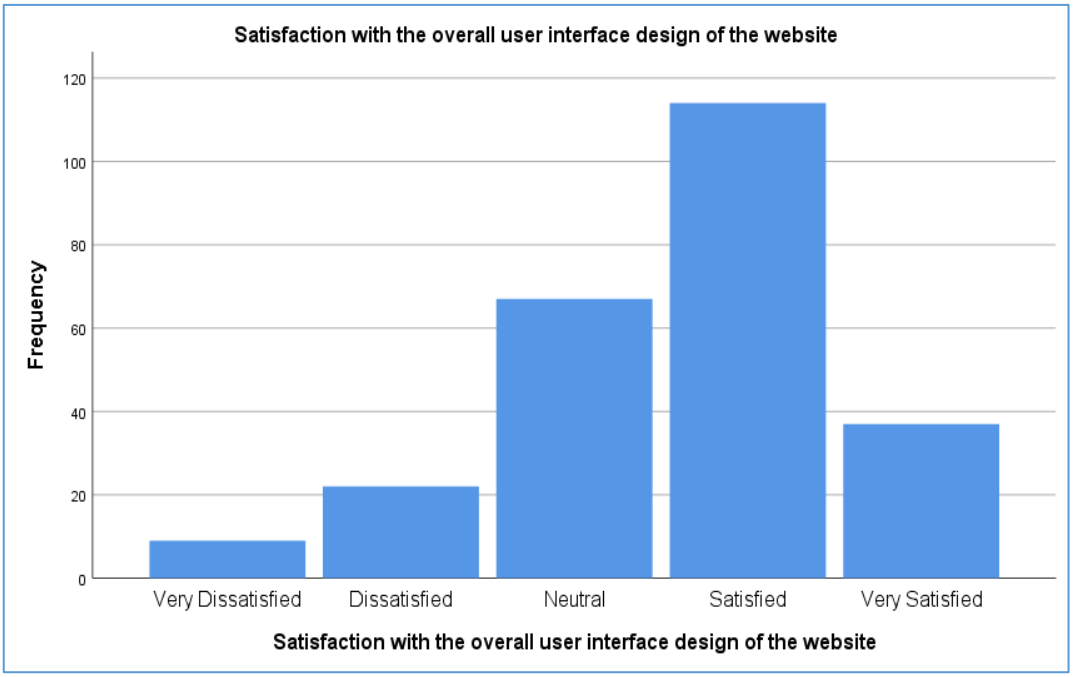


Graph 15: Graphical representation of gender of the participants
(Source: Author)

Satisfaction with the overall user interface design of the website					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	9	3.6	3.6	3.6
	Dissatisfied	22	8.8	8.8	12.4
	Neutral	67	26.9	26.9	39.4
	Satisfied	114	45.8	45.8	85.1
	Very Satisfied	37	14.9	14.9	100.0
	Total	249	100.0	100.0	

Table 20: Table 20: Frequency table of satisfaction with overall user interface design of the website
(Source: Author)

The majority of respondents express satisfaction with the new proposed overall user interface design, with 45.8% being satisfied and 14.9% very satisfied. A smaller percentage are neutral (26.9%), while fewer respondents are dissatisfied (8.8%) or very dissatisfied (3.6%).

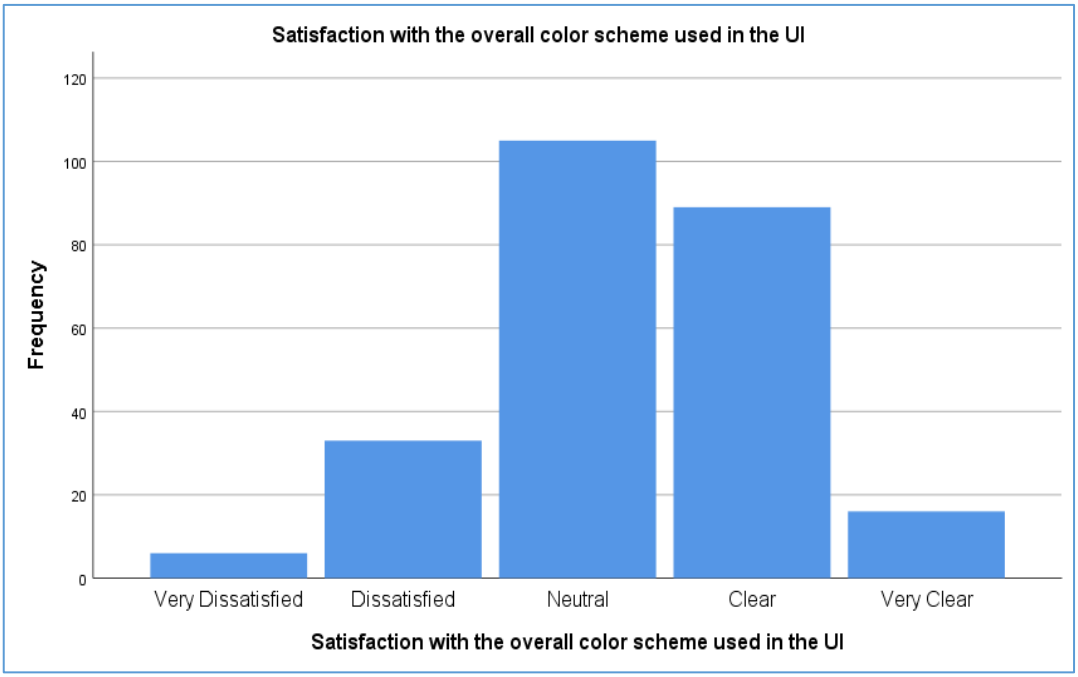


Graph 16: Graphical representation of satisfaction with the overall user interface design of the website
(Source: Author)

Satisfaction with the overall color scheme used in the UI					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	6	2.4	2.4	2.4
	Dissatisfied	33	13.3	13.3	15.7
	Neutral	105	42.2	42.2	57.8
	Clear	89	35.7	35.7	93.6
	Very Clear	16	6.4	6.4	100.0
	Total	249	100.0	100.0	

Table 21: Frequency table of satisfaction with the overall color scheme used in the UI
(Source: Author)

Most respondents are satisfied with the overall color scheme used in the user interface, with 35.7% finding it clear and 6.4% very clear. A smaller percentage are neutral (42.2%), while fewer respondents are dissatisfied (13.3%) or very dissatisfied (2.4%).

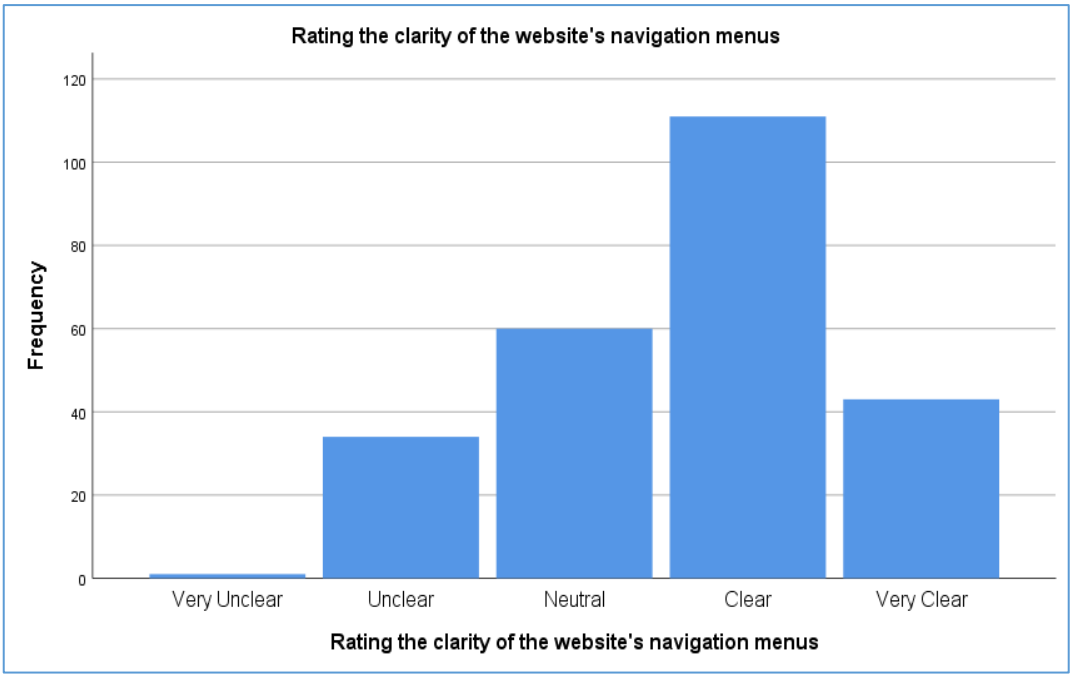


Graph 17: Graphical representation of satisfaction with overall color scheme used in UI (Source: Author)

Rating the clarity of the website's navigation menus					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Unclear	1	.4	.4	.4
	Unclear	34	13.7	13.7	14.1
	Neutral	60	24.1	24.1	38.2
	Clear	111	44.6	44.6	82.7
	Very Clear	43	17.3	17.3	100.0
	Total	249	100.0	100.0	

Table 22: Frequency table of rating the clarity of the website's navigation menus (Source: Author)

The majority of respondents rate the clarity of the website's navigation menus positively, with 44.6% finding them clear and 17.3% very clear. A smaller percentage are neutral(24.1%), while fewer respondents find them unclear (13.7%) or very unclear (0.4%).



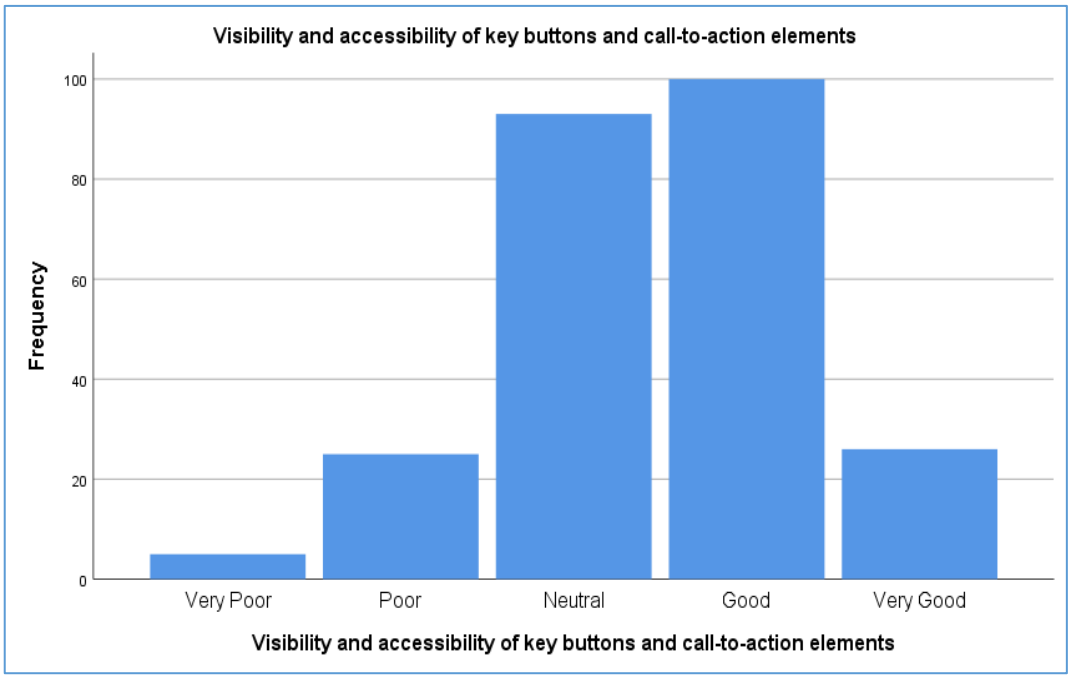
Graph 18: Graphical representation of rating the clarity of the website's navigation menus (Source: Author)

Visibility and accessibility of key buttons and call-to-action elements					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Poor	5	2.0	2.0	2.0
	Poor	25	10.0	10.0	12.0
	Neutral	93	37.3	37.3	49.4
	Good	100	40.2	40.2	89.6
	Very Good	26	10.4	10.4	100.0
	Total	249	100.0	100.0	

Table 23: Table 23: Frequency table of visibility and accessibility of key buttons and call-to-action

(Source: Author)

Most respondents rate the visibility and accessibility of key buttons and call-to-action elements positively, with 40.2% finding them good and 10.4% very good. A smaller percentage are neutral (37.3%), while fewer respondents find them poor (10.0%) or very poor (2.0%).

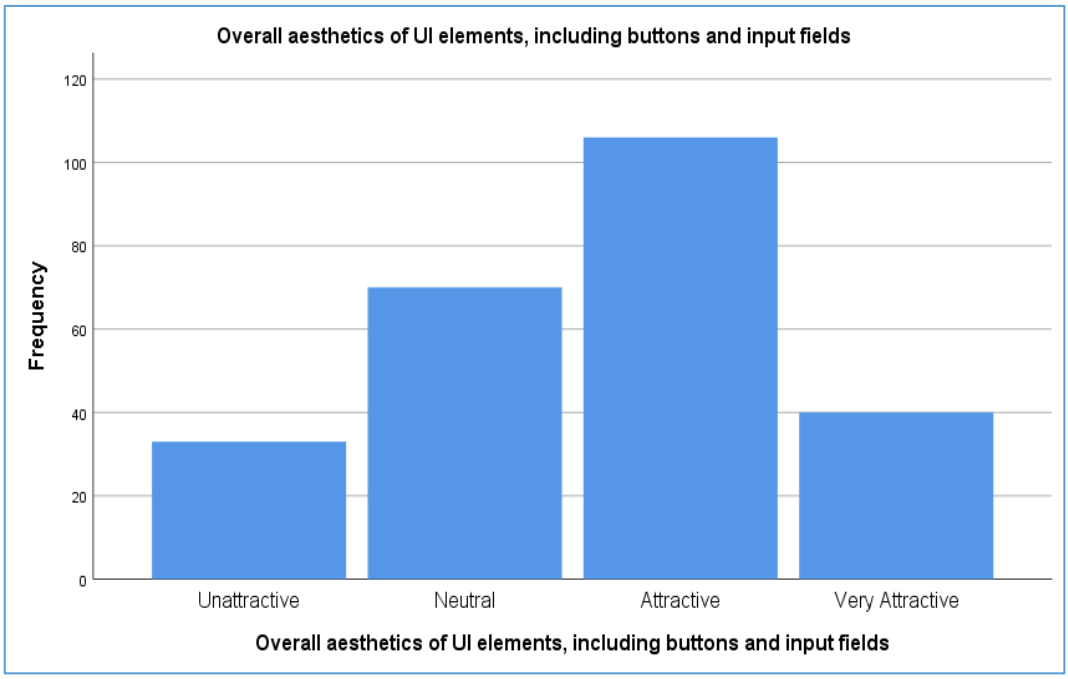


Graph 19: Graphical representation of visibility and accessibility of key buttons and call-to-action elements
(Source: Author)

Overall aesthetics of UI elements, including buttons and input fields					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unattractive	33	13.3	13.3	13.3
	Neutral	70	28.1	28.1	41.4
	Attractive	106	42.6	42.6	83.9
	Very Attractive	40	16.1	16.1	100.0
	Total	249	100.0	100.0	

Table 24: Frequency table of overall aesthetics of UI elements, buttons and input fields
(Source: Author)

Respondents generally find the overall aesthetics of UI elements attractive, with 42.6% considering them attractive and 16.1% very attractive. A smaller percentage are neutral (28.1%), while fewer find them unattractive (13.3%).

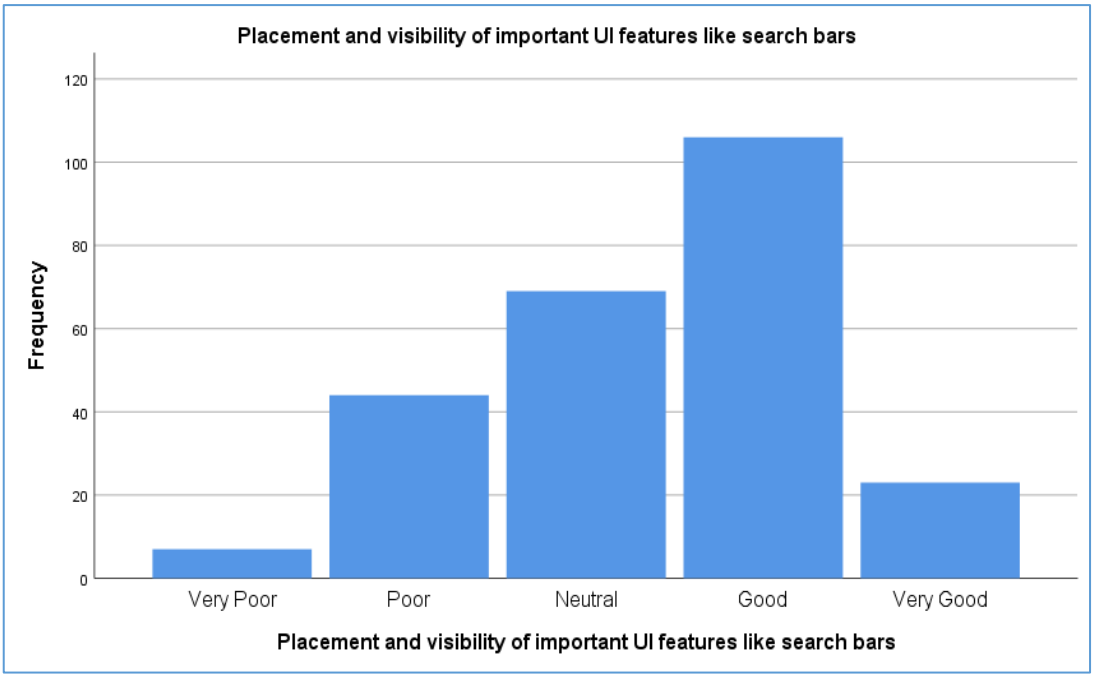


Graph 20: Graphical representation of overall aesthetics of UI elements, including buttons and input fields
(Source: Author)

Placement and visibility of important UI features like search bars					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Poor	7	2.8	2.8	2.8
	Poor	44	17.7	17.7	20.5
	Neutral	69	27.7	27.7	48.2
	Good	106	42.6	42.6	90.8
	Very Good	23	9.2	9.2	100.0
	Total	249	100.0	100.0	

Table 25: Frequency table of placement and visibility of important UI features, search bars
(Source: Author)

Most respondents rate the placement and visibility of important UI features positively, with 42.6% finding them good and 9.2% very good. A smaller percentage are neutral (27.7%), while fewer find them poor (17.7%) or very poor (2.8%).



Graph 21: Graphical representation of placement and visibility of important UI features like search bars

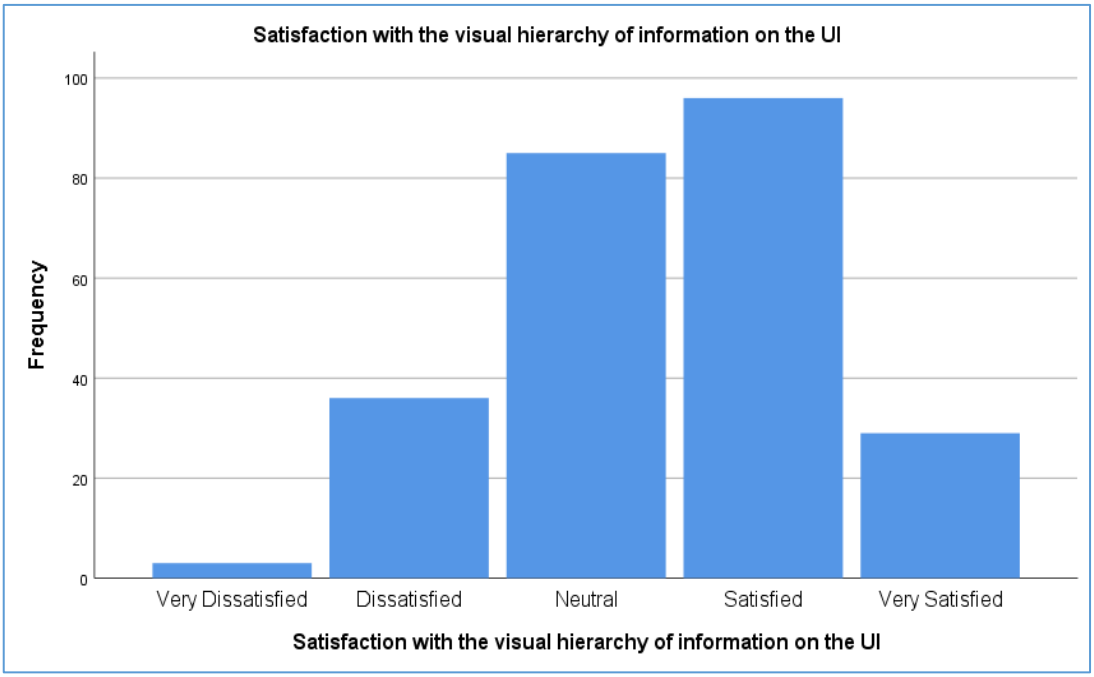
(Source: Author)

Satisfaction with the visual hierarchy of information on the UI					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Dissatisfied	3	1.2	1.2	1.2
	Dissatisfied	36	14.5	14.5	15.7
	Neutral	85	34.1	34.1	49.8
	Satisfied	96	38.6	38.6	88.4
	Very Satisfied	29	11.6	11.6	100.0
	Total	249	100.0	100.0	

Table 26: Frequency table of satisfaction with visual hierarchy of information on the UI

(Source: Author)

The majority of respondents are satisfied with the visual hierarchy of information on the UI, with 38.6% being satisfied and 11.6% very satisfied. A smaller percentage are neutral (34.1%), while fewer respondents are dissatisfied (14.5%) or very dissatisfied (1.2%).



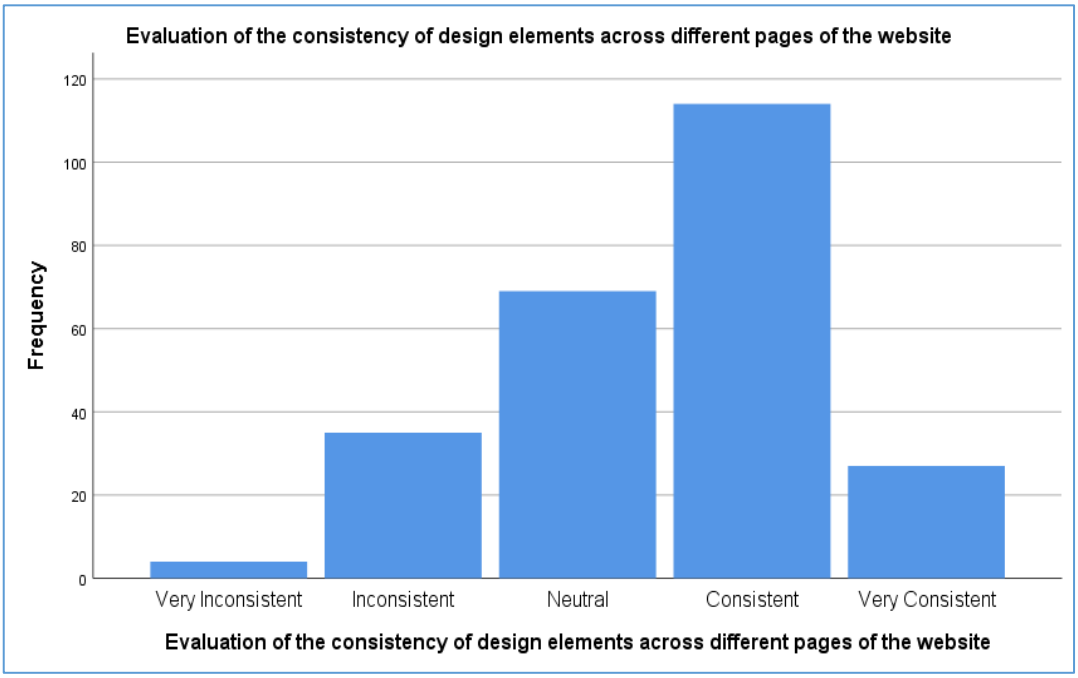
Graph 22: Graphical representation of satisfaction with the visual hierarchy of information on the UI
(Source: Author)

Evaluation of the consistency of design elements across different pages of the website					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Inconsistent	4	1.6	1.6	1.6
	Inconsistent	35	14.1	14.1	15.7
	Neutral	69	27.7	27.7	43.4
	Consistent	114	45.8	45.8	89.2
	Very Consistent	27	10.8	10.8	100.0
	Total	249	100.0	100.0	

Table 27: Evaluation of consistency of design elements across different pages of website
(Source: Author)

Most respondents rate the consistency of design elements across different pages positively, with 45.8% finding them consistent and 10.8% very consistent. A

smaller percentage are neutral (27.7%), while fewer find them inconsistent (14.1%) or very inconsistent (1.6%).

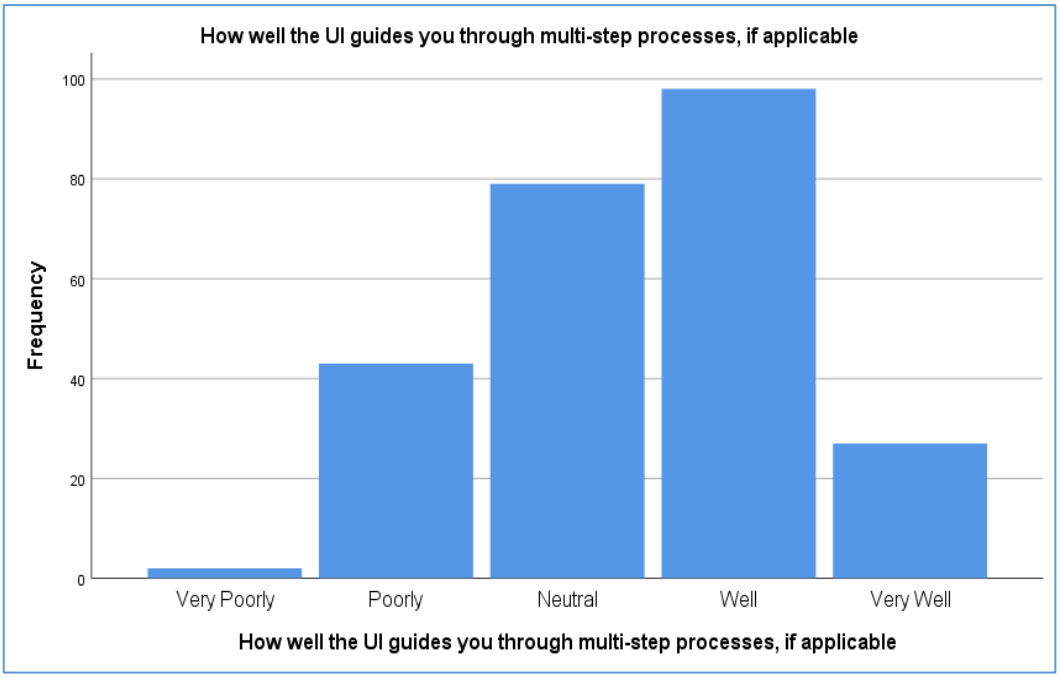


Graph 23: Evaluation of consistency of design elements across different pages of website (Source: Author)

How well the UI guides you through multi-step processes, if applicable					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Poorly	2	.8	.8	.8
	Poorly	43	17.3	17.3	18.1
	Neutral	79	31.7	31.7	49.8
	Well	98	39.4	39.4	89.2
	Very Well	27	10.8	10.8	100.0
	Total	249	100.0	100.0	

Table 28: Frequency table of how well the UI guide multi-step processes, if applicable (Source: Author)

The majority of respondents rate how well UI guide through multi-step processes positively, with 39.4% finding it well and 10.8% very well. A smaller percentage are neutral (31.7%), while fewer find it poor (17.3%) or very poorly (0.8%).



Graph 24: Graphical representation of how well the UI guides you through multi-step processes, if applicable

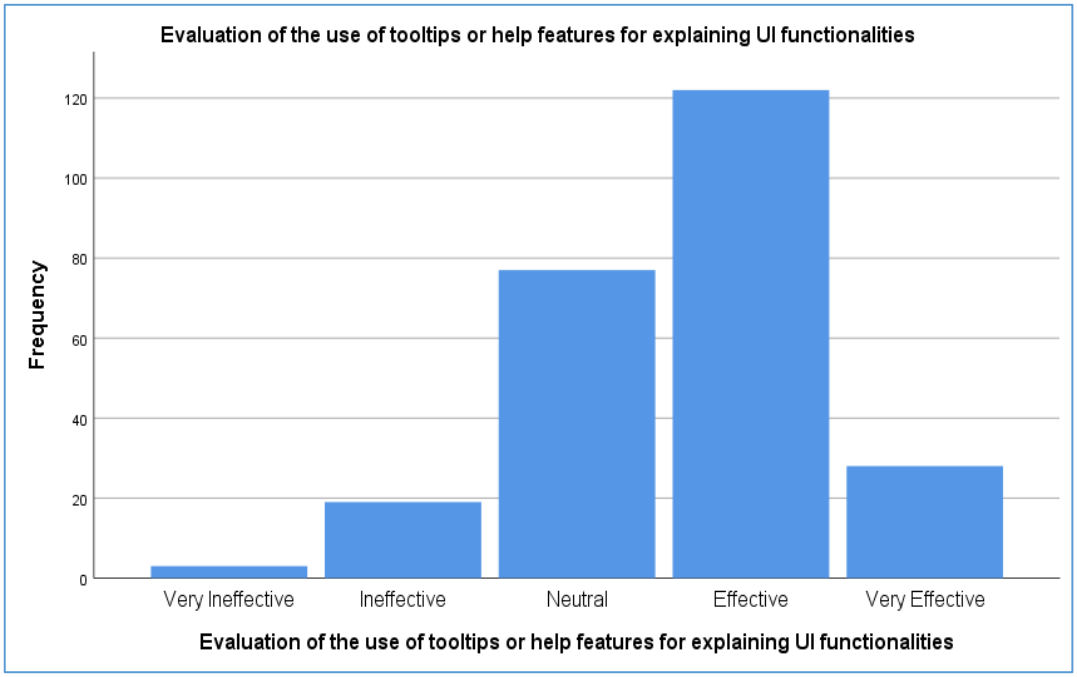
(Source: Author)

Evaluation of the use of tooltips or help features for explaining UI functionalities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Ineffective	3	1.2	1.2	1.2
	Ineffective	19	7.6	7.6	8.8
	Neutral	77	30.9	30.9	39.8
	Effective	122	49.0	49.0	88.8
	Very Effective	28	11.2	11.2	100.0
	Total	249	100.0	100.0	

Table 29: Frequency table of evaluation of the use of tooltips or help features for explaining UI functionalities

(Source: Author)

Most respondents evaluate the use of tooltips or help features positively, with 49.0% finding them effective and 11.2% very effective. A smaller percentage are neutral (30.9%), while fewer find them ineffective (7.6%) or very ineffective (1.2%).



Graph 25: Graphical representation of evaluation of the use of tooltips or help features for explaining UI functionalities
(Source: Author)

4.8 Comparison between existing systems and new proposed UI designs

	Existing Systems		New Proposed UI designs	
	N	Mean	N	Mean
Satisfaction with the overall user interface design of the website	238	2.29	249	3.59
Satisfaction with the overall color scheme used in the UI	238	2.32	249	3.31
Rating the clarity of the website's navigation menus	238	2.34	249	3.65
Visibility and accessibility of key buttons and call-to-action elements	238	2.45	249	3.47
Overall aesthetics of UI elements, including buttons and input fields	238	2.84	249	3.61
Placement and visibility of important UI features like search bars	238	2.87	249	3.38
Satisfaction with the visual hierarchy of information on the UI	238	2.63	249	3.45
Evaluation of the consistency of design elements across different pages of the website	238	2.37	249	3.50
How well the UI guides you through multi-step processes, if applicable	238	2.42	249	3.42
Evaluation of the use of tooltips or help features for explaining UI functionalities	238	1.95	249	3.61

Table 30: Comparison between existing systems and new proposed UI designs (Source: Author)

The table provides a comparison between existing systems and the new proposed UI designs based on various aspects of user satisfaction. Here's the interpretation of the table:

Satisfaction with the Overall User Interface Design of the Website: The mean satisfaction score for the new proposed UI designs (3.59) is significantly higher

compared to existing systems (2.29). This suggests that the new UI designs are better received by users.

Satisfaction with the Overall Color Scheme Used in the UI: Similarly, the mean satisfaction score for the color scheme in the new proposed UI designs (3.31) is notably higher than that of existing systems (2.32), indicating an improvement in color scheme satisfaction.

Rating the Clarity of the Website's Navigation Menus: Users find the navigation menus significantly clearer in the new proposed UI designs (mean score of 3.65) compared to existing systems (mean score of 2.34).

Visibility and Accessibility of Key Buttons and Call-to-Action Elements: The new proposed UI designs (mean score of 3.47) outperform existing systems (mean score of 2.45) in terms of the visibility and accessibility of key buttons and call-to-action elements.

Overall Aesthetics of UI Elements, Including Buttons and Input Fields: The mean satisfaction score for the overall aesthetics of UI elements in the new proposed designs (3.61) is higher compared to existing systems (2.84), indicating an enhancement in visual appeal.

Placement and Visibility of Important UI Features like Search Bars: The new proposed UI designs (mean score of 3.38) exhibit better placement and visibility of important UI features like search bars compared to existing systems (mean score of 2.87).

Satisfaction with the Visual Hierarchy of Information on the UI: Users express higher satisfaction with the visual hierarchy of information in the new proposed UI designs (mean score of 3.45) compared to existing systems (mean score of 2.63).

Evaluation of the Consistency of Design Elements Across Different Pages of the Website: The new proposed UI designs (mean score of 3.50) demonstrate better

consistency of design elements across different pages compared to existing systems (mean score of 2.37).

How Well the UI Guides You Through Multi-step Processes, if Applicable: Users find the UI in the new proposed designs (mean score of 3.42) more effective in guiding them through multi-step processes compared to existing systems (mean score of 2.42).

Evaluation of the Use of Tooltips or Help Features for Explaining UI Functionalities: The new proposed UI designs (mean score of 3.61) receive higher satisfaction ratings for the use of tooltips or help features compared to existing systems (mean score of 1.95).

In summary, the comparison indicates that the new proposed UI designs generally outperform existing systems across various aspects of user satisfaction, including overall design, color scheme, navigation clarity, accessibility, aesthetics, consistency, and guidance through multi-step processes. These findings suggest that the proposed UI designs have the potential to enhance the user experience for tourists visiting Nepal.

5. Results and Discussion

The practical phase of this research unfolded with meticulous scrutiny of user satisfaction with existing tourism websites in Nepal juxtaposed against the proposed UI designs for the new web-based information system. Through comprehensive surveys and robust statistical analyses, the study unearthed a plethora of insights and revelations.

The evaluation of user satisfaction with existing tourism websites revealed a disconcerting trend. Respondents expressed moderate to low levels of satisfaction across various dimensions of UI design. Navigation clarity emerged as a significant pain point, with users often struggling to navigate through the maze of information. Aesthetics, too, failed to meet expectations, with respondents deeming the visual appeal of the websites subpar. Furthermore, the placement and visibility of key elements such as search bars and call-to-action buttons left much to be desired, hampering the overall user experience. These findings corroborate with previous research, indicating a systemic issue plaguing the usability of tourism websites in Nepal.

Further statistical analyses, including regression modeling, and ANOVA testing, provided deeper insights into the interplay between UI elements and user satisfaction. Regression modeling revealed significant predictors among UI aspects, shedding light on the key drivers of user satisfaction. ANOVA testing confirmed the robustness of the regression model, reaffirming the importance of UI elements in shaping user perceptions of website design.

In stark contrast, the proposed UI designs for the new web-based information system elicited overwhelmingly positive responses from users. Significant enhancements were observed across all facets evaluated, signalling a promising shift towards a more user-centric approach. Navigation clarity saw marked improvement, with users lauding the intuitive layout and streamlined navigation menus. The aesthetic overhaul was also well-received, with respondents praising the modern design elements and visually appealing interface. Additionally, the strategic placement of key elements garnered praise, as users found it easier to locate essential features such as search bars and booking buttons. These findings

underscore the efficacy of a user-centered design approach in enhancing the overall tourist experience.

Overall, it underscores the transformative potential of user-centered design in revolutionizing the tourist experience in Nepal. By addressing the deficiencies of existing systems and embracing innovative design principles, Nepal has the opportunity to redefine itself as a premier global travel destination. The findings highlight how crucial it is to continue creating and improving web-based information systems in order to guarantee Nepal's tourism sector's success.

6. Conclusion

In conclusion, this thesis has conducted an extensive investigation into the function of a web-based information system designed specifically for tourists in Nepal, following the same investigative methodology used in the analysis of web-based information systems in the Nepali tourism sector. This thesis has shed light on the critical role of user-centered design principles in the development of web-based information systems tailored for tourists in Nepal. By addressing the existing research gap and proposing a user-centric approach to design, this study has laid the groundwork for the creation of a comprehensive and user-friendly system that meets the diverse needs of tourists visiting Nepal. Through meticulous evaluation and analysis, the research findings have underscored the importance of prioritizing user satisfaction, optimized key UI elements, and embracing innovation in system design. Based on the outlined objectives and the actions taken to achieve them, the conclusion of the thesis can be summarized as follows:

User Needs and Preferences Analysis:

- A survey was conducted to gather user needs and preferences regarding existing tourism web-based information systems in Nepal.
- The findings of the survey provided insights into areas for potential improvement in the existing systems, highlighting aspects where enhancements could be made to improve user experience and usability.
- This thesis underscores the pivotal role of a user-centric design approach in shaping the development of web-based information systems tailored for tourists in Nepal.
- By prioritizing the understanding of user needs and preferences, stakeholders can create more intuitive and user-friendly systems that resonate with visitors.

Utilization of UML Representations:

- Various UML diagrams such as Class diagrams, Use Case Diagrams, and Activity diagrams were developed to illustrate the relationships and interactions between system elements.

- The effective use of UML diagrams facilitated the creation of a well-planned and user-friendly system that closely aligned with user expectations.

Prototype designs with low and high-fidelity wireframes:

- Low-fidelity and high-fidelity wireframes were designed, incorporating proposed UI designs addressing weaknesses observed in existing systems.
- A subsequent survey was conducted to measure user satisfaction levels regarding the new proposed UI designs.
- The results of the survey indicated a generally positive reception of the proposed UI designs, suggesting an improvement in user experience for tourists visiting Nepal.
- Optimized key UI elements: Furthermore, focusing on enhancing key UI elements such as color schemes, navigation clarity, and button visibility holds the promise of significantly improving overall user satisfaction and experience.

Comparison with Existing Systems:

- A comparative analysis was performed between the new proposed UI designs and existing systems, focusing on various aspects of user satisfaction.
- The comparison revealed that the new proposed UI designs generally outperformed existing systems across multiple dimensions such as overall design, color scheme, navigation clarity, accessibility, aesthetics, consistency, and guidance through multi-step processes.
- These findings indicate the potential of the proposed UI designs to enhance the user experience for tourists visiting Nepal.

Future Implications: Looking ahead, the implementation of the proposed UI designs has the potential to not only enhance tourist engagement and satisfaction levels but also to catalyze growth within Nepal's tourism sector, contributing to its long-term sustainability and economic prosperity. As stakeholders continue to prioritize user needs and embrace innovation, Nepal can further solidify its

position as a premier global travel destination, offering unparalleled experiences for travelers while promoting sustainable tourism practices and fostering economic development. By implementing the proposed UI designs and prioritizing user satisfaction, stakeholders have the opportunity to significantly enhance tourist engagement and satisfaction levels, ultimately bolstering Nepal's tourism sector and contributing to its long-term sustainability and growth.

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8. List of Tables, Graphs, Figures and Abbreviations

8.1 List of Tables

8.2 List of Graphs

8.3 List of Figures

8.4 List of Abbreviations

WBIS: Web-based information system

GDP: Gross domestic product

ICT: Information and communications technology

NRS: Nepalese Rupees

NTB: Nepal Tourism Board

UNESCO: United Nations Educational, Scientific and Cultural Organization

UI: User Interface

GIS: Geographic information systems

TIS: Tourist Information System

TE: Tourist engagement

KPI: Key performance indicator

UML: Unified Modeling Language

ERD: Entity relationship diagram

WTO: World Tourism Organisation.

UCD: User-centered design

RAD: Rapid Application Development Model

SPSS: Statistical Package for the Social Sciences

Appendix

Appendix A: Survey Questionnaires

Demographics:

Age:

1 = Under 18

2 = 18-24

3 = 25-34

4 = 35-44

5 = 45-54

6 = 55-64

7 = 65 or older

Gender:

1 = Male

2 = Female

3 = Other

How often do you visit travel and tourism websites?

1 = Rarely

2 = Occasionally

3 = Regularly

4 = Frequently

(Dependent variable): User Satisfaction

1) How satisfied are you with the overall user interface (UI) design of the website?

   1 = Very Dissatisfied

   2 = Dissatisfied

   3 = Neutral

   4 = Satisfied

   5 = Very Satisfied

(Independent variable): UI Aspects

2) How satisfied are you with the overall color scheme used in the UI?

   1 = Very Dissatisfied

   2 = Dissatisfied

   3 = Neutral

   4 = Satisfied

   5 = Very Satisfied

3) How would you rate the clarity of the website's navigation menus?

   1 = Very Unclear

   2 = Unclear

   3 = Neutral

   4 = Clear

   5 = Very Clear

4) Rate the visibility and accessibility of key buttons and call-to-action elements.

   1 = Very Poor

   2 = Poor

   3 = Neutral

   4 = Good

   5 = Very Good

5) Rate the overall aesthetics of UI elements, including buttons and input fields.

   1 = Very Unattractive

   2 = Unattractive

   3 = Neutral

   4 = Attractive

   5 = Very Attractive

6) Evaluate the placement and visibility of important UI features like search bars.

   1 = Very Poor

   2 = Poor

   3 = Neutral

4 = Good

5 = Very Good

7) How satisfied are you with the visual hierarchy of information on the UI?

1 = Very Dissatisfied

2 = Dissatisfied

3 = Neutral

4 = Satisfied

5 = Very Satisfied

8) Evaluate the consistency of design elements across different pages of the website.

1 = Very Inconsistent

2 = Inconsistent

3 = Neutral

4 = Consistent

5 = Very Consistent

9) How well does the UI guide you through multi-step processes, if applicable?

1 = Very Poorly

2 = Poorly

3 = Neutral

4 = Well

5 = Very Well

10) Evaluate the use of tooltips or help features for explaining UI functionalities.

1 = Very Ineffective

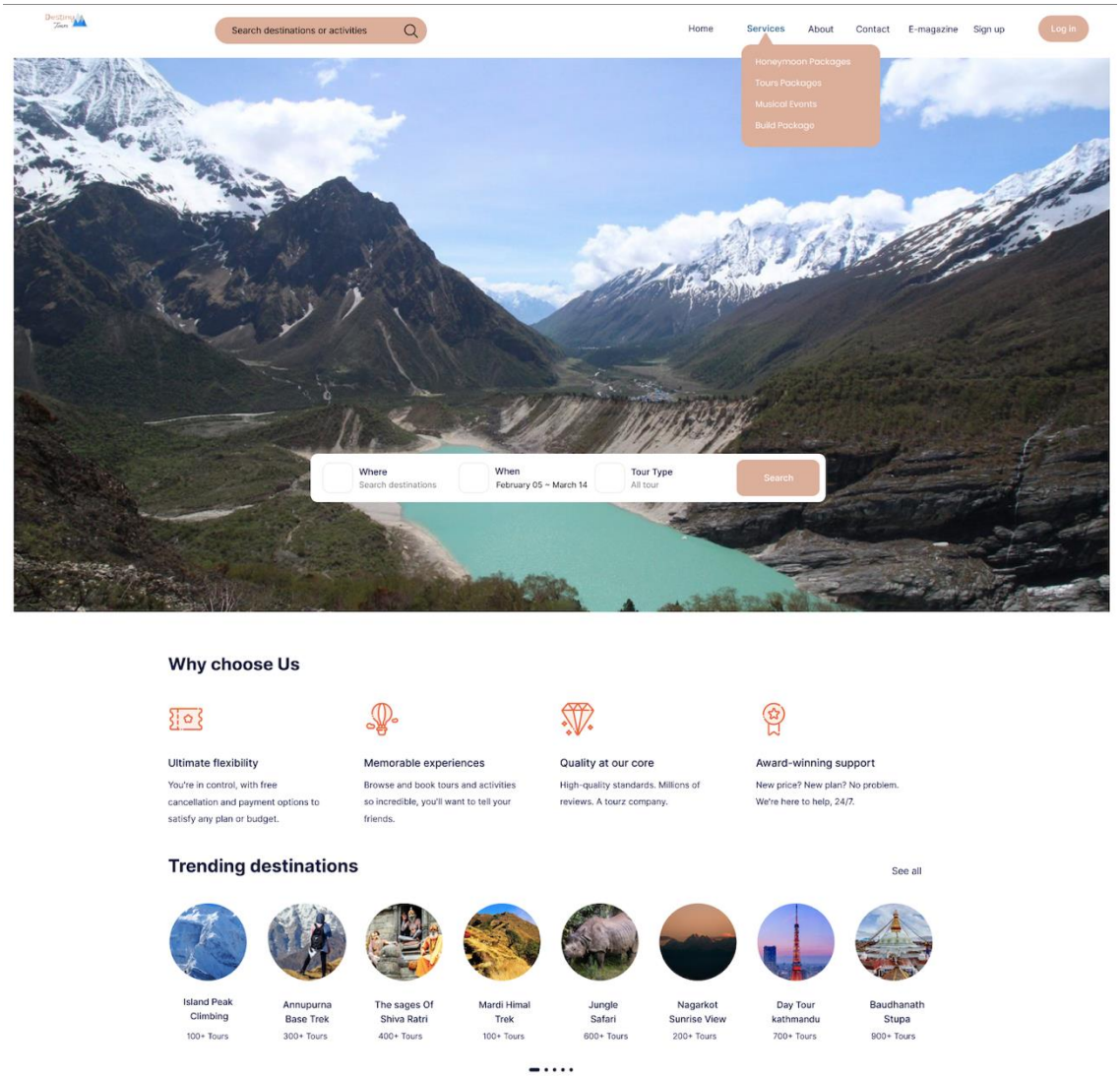
2 = Ineffective

3 = Neutral

4 = Effective

5 = Very Effective

Appendix B: High Fidelity Wireframes -Landing Page



Find Popular Tours

See all

Nepal

The Baudhanath Yoga Experience

4.8 (243)

From $75.00

Kathamandu

Kathmandu Valley Half Day Tour

4.8 (243)

$25

Kathamandu

Kathmandu: Private 7 UNESCO Heritage Sites Day Tour

4.8 (243)

$90

Bhaktapur

Bhaktapur Durbar Square and Boudhanath Stupa

4.8 (243)

$171

Kathmandu

Kathmandu: 3 hours night Pashupatinath Aarti Tour

4.8 (243)

$80

Kathmandu

Kathmandu: Chandragiri Cable Car and Monkey Temple Tour

4.8 (243)

$200

Pokhara

Pokhara: Full-Day Private Tour of 7 Iconic Destinations

4.8 (243)

$90

Kathmandu

Kathmandu: Everest Mountain Flight with Private Transfers

4.8 (243)

$771

Grab up to 35% off on your favorite Destination

Limited time offer, don't miss the opportunity

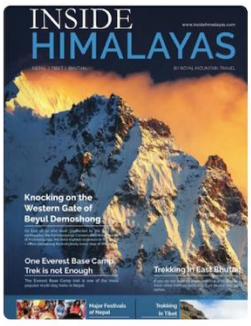
Book Now

E-magazines

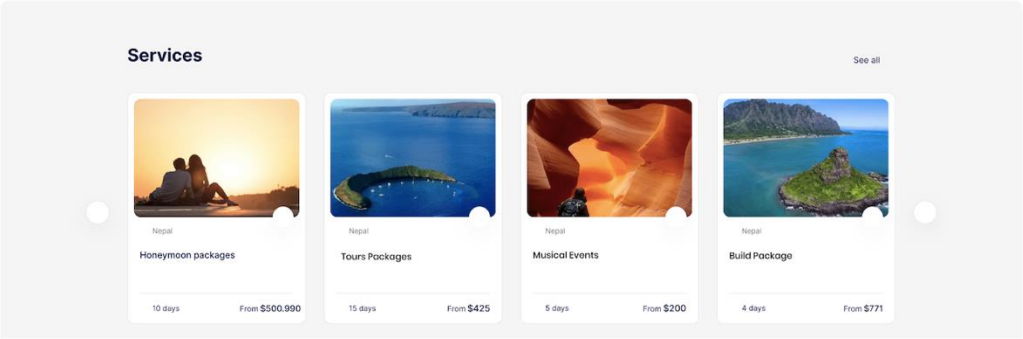
See all

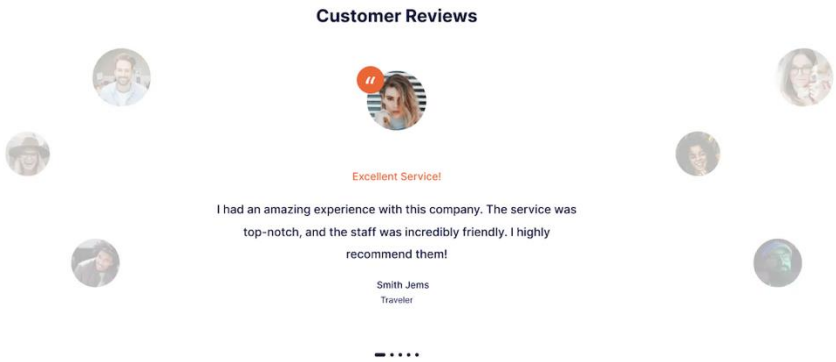
Issue 3

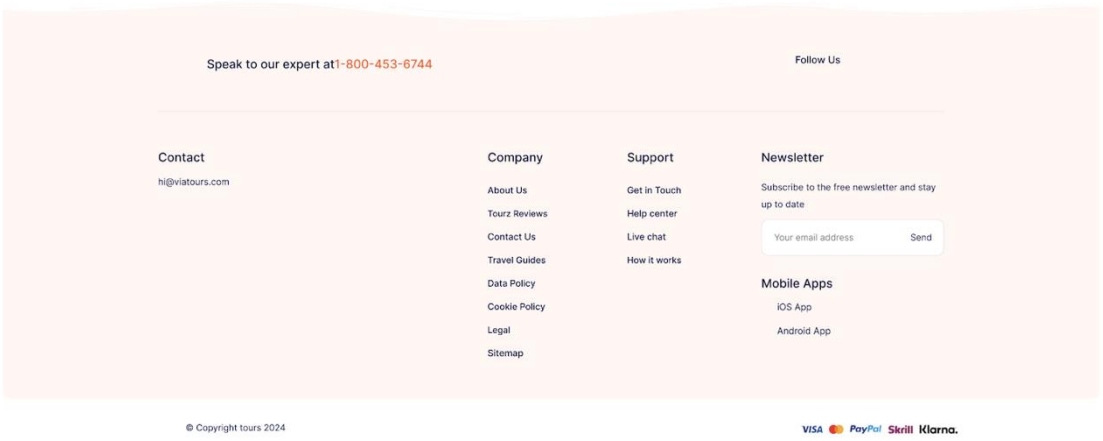
Issue 2



Issue 1


Services
See all
Nepal
Honeymoon packages
10 days
From $500.990
Nepal
Tours Packages
15 days
From $425
Nepal
Musical Events
5 days
From $200
Nepal
Build Package
4 days
From $771


Customer Reviews
Excellent Service!
I had an amazing experience with this company. The service was top-notch, and the staff was incredibly friendly. I highly recommend them!
Smith Jems
Traveler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Company
About Us
Tourz Reviews
Contact Us
Travel Guides
Data Policy
Cookie Policy
Legal
Sitemap
Support
Get in Touch
Help center
Live chat
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