ARTIFICIAL INTELLIGENCE IN TOURISM SECTOR IN NEPAL

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By

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CERTIFICATION OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled “ARTIFICIAL INTELLIGENCE IN TOURISM SECTOR IN NEPAL".The work of this dissertation has not been submitted previously for the purpose of conferral of any degrees nor has it been proposed and presented as part of requirements for any other academic purposes. The assistance and cooperation that I have received during this research work has been acknowledged. In addition, I declare that all information sources and literature used are cited in the reference section of this dissertation.

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REPORT OF RESEARCH COMMITTEE

Mr. Alok Khatiwada has defended research proposal entitled "ARTIFICIAL INTELLIGENCE IN TOURISM SECTOR IN NEPAL" successfully. The research committee has registered the dissertation for further progress. It is recommended to carry out the work as per suggestions and guidance of supervisor Deepak Basnet submit the dissertation for evaluation and viva-voce examination.

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APPROVAL SHEET

We, the undersigned, have examined the dissertation entitled "ARTIFICIAL INTELLIGENCE IN TOURISM SECTOR IN NEPAL" presented by Alok Khatiwada candidate for the degree of Master of Business Studies (MBS Semester) and conducted the viva voce examination of the candidate. We hereby certify that the dissertation is worthy of acceptance.

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ABBREVIATIONS

ACAP	:	Annapurna Conservation Area Project
AI	:	Artificial Intelligence
ANOVA	:	Analysis of Variance
AR	:	Augmented Reality
CBS	:	Central Bureau of Statistics
CV	:	CoefficientofVariation
GPS	:	Global Positioning System
IUCN	:	International Union for Conservation of Nature
MOF	:	Ministry of finance
MoCTCA	:	Ministry of Culture, Tourism and Civil Aviation
POS	:	Point of Sale
SD	:	StandardDeviation
TU	:	Tribhuvan University
UNESCO	:	UN Educational, Scientific and Cultural Organization
UNWTO	:	United Nations World Tourism Organization
VR	:	Virtual Reality
WTTC	:	World Travel & Tourism Council

ABSTRACTS

Nepal, renowned for its majestic mountains and rich cultural heritage, is a prime destination for both tourists and mountaineers. In recent years, the country has witnessed a surge in visitor numbers, presenting both opportunities and challenges for sustainable tourism and mountaineering development. This thesis explores the potential of artificial intelligence (AI) to enhance the tourism and mountaineering sectors in Nepal. Through a comprehensive analysis of existing literature, case studies, and stakeholder perspectives, this research investigates the application of AI in improving visitor experiences, promoting destination sustainability, and enhancing safety measures in mountain expeditions. Practical recommendations will be provided to stakeholders to leverage AI effectively while ensuring the preservation of Nepal's natural and cultural heritage.

Keywords: *Artificial Intelligence, Tourism, Mountaineering, Nepal, Sustainable Development, Visitor Experience, Safety Measures*

CHAPTER-I
INTRODUCTION

1.1 Backgroundof theStudy

Nepal, nestled amidst the majestic Himalayas, boasts a rich tapestry of cultural heritage, breathtaking landscapes, and unparalleled opportunities for adventure tourism, particularly in mountaineering. Over the years, Nepal has witnessed a steady growth in tourism, with travelers from across the globe drawn to its iconic trekking routes, UNESCO World Heritage sites, and challenging peaks, including the legendary Mount Everest.

However, this surge in tourism brings both opportunities and challenges for Nepal. While tourism contributes significantly to the country's economy, it also puts immense pressure on its fragile ecosystems, cultural sites, and local communities. Sustainable tourism development has thus emerged as a critical imperative, aiming to balance the economic benefits of tourism with environmental conservation and socio-cultural preservation.

In recent times, the advent of artificial intelligence (AI) has revolutionized various industries worldwide, including tourism. AI technologies offer unprecedented capabilities to enhance visitor experiences, optimize operational efficiency, and address sustainability concerns. In the context of Nepal, harnessing AI holds immense potential to not only elevate the quality of tourism services but also to foster sustainable development practices in the tourism and mountaineering sectors.

This study seeks to explore the intersection of AI and sustainable tourism in Nepal, focusing specifically on the mountaineering sector due to its prominence in the country's tourism landscape. By examining the application of AI-driven solutions in areas such as visitor engagement, safety measures, and destination management, this research aims to identify opportunities for leveraging AI to promote sustainable tourism practices and foster inclusive growth.

Moreover, this study recognizes the importance of engaging stakeholders, including government agencies, tour operators, local communities, and international organizations, in the discourse on AI adoption for tourism development in Nepal. By understanding their perspectives, challenges, and aspirations, this research endeavors to provide actionable insights and recommendations for harnessing AI effectively while preserving Nepal's natural and cultural heritage.

In summary, this study seeks to bridge the gap between technological innovation and sustainable tourism development in Nepal, highlighting the transformative potential of AI in shaping the future of tourism and mountaineering in the Himalayan nation. Through interdisciplinary research and collaboration, it aims to contribute to the advancement of sustainable tourism practices and the empowerment of local communities in Nepal's tourism ecosystem.

1.2 Problem Statement

Despite the significant economic contributions of tourism and mountaineering to Nepal's economy, there exist pressing challenges that threaten the long-term sustainability and resilience of these sectors. The rapid growth in tourist numbers, coupled with the inherent risks associated with mountaineering expeditions, exacerbates issues related to environmental degradation, cultural erosion, and safety concerns. Moreover, the COVID-19 pandemic has further underscored the vulnerability of Nepal's tourism industry to external shocks, highlighting the need for diversified and resilient strategies for tourism development.

In this context, the traditional approaches to tourism management and mountaineering expedition planning are increasingly proving inadequate in addressing the evolving needs and complexities of the industry. Manual processes for visitor engagement, safety monitoring, and destination management are often resource-intensive, time-consuming, and prone to inefficiencies. Additionally, the lack of real-time data analytics and predictive capabilities hampers the ability of stakeholders to anticipate and respond effectively to emerging challenges such as natural disasters, climate change impacts, and changing traveler preferences.

Moreover, while there is growing recognition of the importance of sustainable tourism practices, the translation of sustainable principles into actionable strategies remains a significant challenge. Balancing the economic benefits of tourism with environmental conservation and socio-cultural preservation requires innovative solutions that prioritize long-term stewardship of Nepal's natural and cultural heritage.

Against this backdrop, the potential of artificial intelligence (AI) to address these multifaceted challenges in the tourism and mountaineering sectors remains largely untapped. AI technologies offer unprecedented opportunities to revolutionize various aspects of tourism management, including personalized visitor experiences, real-time

risk assessment, and data-driven decision-making. However, the integration of AI into Nepal's tourism ecosystem is hindered by barriers such as limited technological infrastructure, inadequate skill development, and regulatory constraints.

Therefore, the central problem addressed by this study revolves around the following questions:

- How does the type of visit (Trekking and Mountaineering, Business, Pilgrimage, Official, Convention/Conference, Others, and Not Specified) impact the mean total number of visitors over different years?
- What is the relationship between income generation and the number of tourist arrivals in different visit categories?
- How has AI integration impacted income generation in Nepal's tourism and mountaineering sector for local communities and the national economy?

Addressing these questions is essential for advancing the discourse on sustainable tourism development in Nepal and guiding policymakers, industry stakeholders, and local communities towards inclusive, resilient, and environmentally responsible tourism practices.

1.3 Objectivesof theStudy

- To identify how different types of visits (Trekking and Mountaineering, Business, Pilgrimage, Official, Convention/Conference, Others, and Not Specified) influence the mean total number of visitors over various years.
- To examine the relationship between income generation and the number of tourist arrivals across different visit categories.
- To analyze the impact of AI integration on income generation within Nepal's tourism and mountaineering sector.

1.4 RationaleoftheStudy

Critical Need for Sustainable Development: Nepal's tourism and mountaineering sectors play a vital role in the country's economy, but rapid growth and inadequate management practices pose significant challenges to sustainability. There is a pressing need to adopt innovative approaches to ensure that tourism development in Nepal is environmentally responsible, socially inclusive, and economically viable in the long term.

Potential of Artificial Intelligence: Artificial intelligence (AI) has emerged as a powerful tool for optimizing various aspects of tourism and mountaineering management. By leveraging AI technologies, Nepal can enhance visitor experiences, improve safety measures, and promote sustainable practices, thereby addressing key challenges faced by the tourism and mountaineering sectors.

Global Trends and Best Practices: Many countries have successfully integrated AI into their tourism industries, yielding tangible benefits in terms of efficiency, personalization, and sustainability. Studying global trends and best practices in AI adoption can provide valuable insights for Nepal's tourism stakeholders to adapt and innovate in their approach to sustainable tourism development.

Opportunities for Innovation and Collaboration: Nepal's unique natural and cultural assets offer ample opportunities for innovation in tourism and mountaineering experiences. By harnessing AI, stakeholders can create immersive, personalized experiences for visitors while minimizing negative impacts on the environment and local communities. Moreover, collaboration between government agencies, private sector entities, and local communities is essential for maximizing the potential of AI in driving sustainable tourism development.

Capacity Building and Skill Development: Integrating AI into Nepal's tourism and mountaineering sectors requires the development of relevant skills and capacities among stakeholders. By conducting research on AI applications and disseminating knowledge through training programs and capacity-building initiatives, this study can empower local communities, tour operators, and government agencies to harness AI effectively for sustainable development.

Resilience in the Face of Challenges: The COVID-19 pandemic has underscored the importance of resilience in the tourism industry. By embracing AI-driven solutions, Nepal can enhance its capacity to adapt to unforeseen challenges, such as pandemics, natural disasters, and changing traveler preferences, thereby ensuring the continued growth and resilience of its tourism and mountaineering sectors.

Ethical and Cultural Considerations: As Nepal integrates AI into its tourism industry, it must carefully consider the ethical and cultural implications of technological advancements. This study provides an opportunity to examine these considerations in depth, ensuring that AI adoption in Nepal's tourism and mountaineering sectors is guided by principles of equity, cultural sensitivity, and social responsibility.

In summary, this study is motivated by the urgent need to address sustainability challenges in Nepal's tourism and mountaineering sectors through the strategic adoption of artificial intelligence. By examining global best practices, fostering collaboration, building capacities, and considering ethical and cultural dimensions, this research seeks to contribute to the development of a more resilient, inclusive, and sustainable tourism industry in Nepal.

1.5 Limitations of the Study

Thelimitations of this studyareasfollows:

- **Scope Limitation.**The study's focus on artificial intelligence (AI) applications in sustainable tourism and mountaineering development in Nepal may limit the examination of other relevant factors influencing these sectors, such as government policies, socio-economic dynamics, and geopolitical factors. Therefore, the findings may not provide a comprehensive understanding of all the challenges and opportunities faced by Nepal's tourism industry.
- **Data Availability.** Limited availability of data, particularly regarding AI initiatives and their impacts on sustainable tourism and mountaineering in Nepal, may constrain the depth of analysis and the generalizability of findings. The reliance on secondary data sources and case studies from other regions may introduce biases or inaccuracies in the study's conclusions.
- **Technological Infrastructure.**Nepal's technological infrastructure, including internet connectivity and access to AI tools and platforms, may present significant barriers to the implementation of AI-driven solutions. The study may not fully capture the practical challenges and limitations associated with deploying AI technologies in resource-constrained environments.
- **Cultural and Contextual Factors.** The cultural diversity and socio-economic disparities within Nepal's tourism destinations may influence the adoption and effectiveness of AI applications differently across regions. The study may overlook the nuanced cultural and contextual factors that shape stakeholder perceptions and behaviors regarding AI adoption and sustainable tourism practices.
- **Sampling Bias.**The study's reliance on a specific set of stakeholders, such as government officials, tour operators, and international organizations, may

introduce sampling bias and limit the representativeness of perspectives within Nepal's diverse tourism ecosystem. Perspectives from marginalized or underrepresented groups, such as local communities and small-scale enterprises, may be underrepresented in the study.

- L**ong-term Impact Assessment.** The study may not assess the long-term sustainability and scalability of AI-driven initiatives in Nepal's tourism and mountaineering sectors. The focus on short-term outcomes and case studies may overlook the potential for unintended consequences or sustainability challenges that emerge over time.
- **Ethical Considerations.** While the study acknowledges the ethical implications of AI adoption in tourism, it may not delve deeply into the ethical dilemmas and cultural sensitivities specific to Nepal's context. The study's recommendations for ethical AI practices may be generic and may require further customization to address Nepal's unique cultural and socio-economic landscape.
- **External Validity.** The findings and recommendations of the study may have limited applicability to other countries or regions with different socio-economic contexts, governance structures, and tourism dynamics. Therefore, caution should be exercised when generalizing the study's findings beyond the Nepalese context.

CHAPTER-II
LITERATUREREVIEW

It includes literature regarding conceptual, theoretical, and empirical review of relatedstudieswhich support this study.

2.1 TheoreticalReview

In this section of the study the concept of insurance tourism and artificial intelligence arereviewed.

2.1.1 Economic Significance

Nepal's tourism industry contributes significantly to the national economy, generating revenue, foreign exchange earnings, and employment opportunities. According to Nepal's Ministry of Tourism, the sector accounted for approximately 7.9% of the country's GDP in 2019, employing over a million people directly and indirectly (MoCTCA, 2020). Tourism revenues play a vital role in supporting livelihoods, particularly in rural areas where tourism activities are concentrated (Bhagwat & Pandit, 2018).

2.1.2 Tourist Arrivals and Trends

Nepal has experienced steady growth in tourist arrivals over the years, albeit with fluctuations due to factors such as political instability, natural disasters, and global economic conditions. In 2019, Nepal welcomed over 1.2 million international tourists, marking a 9.6% increase from the previous year (MoCTCA, 2020). The majority of tourists visit Nepal for trekking, mountaineering, religious pilgrimage, and cultural sightseeing, with a significant proportion coming from neighboring countries like India and China (Adhikari &Goldey, 2010).

2.1.3 Mountaineering Sector

Mountaineering holds a special place in Nepal's tourism landscape, with the country boasting eight of the world's fourteen highest peaks, including Mount Everest, the highest point on Earth. The allure of conquering these formidable peaks attracts thousands of mountaineers and adventure enthusiasts from around the globe each year (Upreti& Tanaka, 2012). The revenue generated from mountaineering permits, expedition fees, and related services contributes substantially to Nepal's tourism revenue (Dahal et al., 2020).

2.1.4 Challenges and Opportunities

Despite its immense potential, Nepal's tourism industry faces several challenges, including inadequate infrastructure, environmental degradation, political instability, and seasonal variations in tourist arrivals (Khanal&Tse, 2019). Additionally, the country's dependence on trekking and mountaineering tourism makes it vulnerable to external shocks, such as the COVID-19 pandemic, which resulted in a sharp decline in tourist arrivals and revenue (MoTCA, 2021). However, there are also opportunities for diversification and innovation within the tourism sector, including the promotion of sustainable tourism practices, development of new tourism products, and investment in infrastructure development (Shrestha & Bhandari, 2020).

2.1.5 Sustainability Concerns

The rapid growth of tourism, particularly in ecologically sensitive areas such as the Everest region and the Annapurna Conservation Area, has raised concerns about environmental degradation, waste management, and cultural erosion (Ghimire et al., 2019). Sustainable tourism development has thus emerged as a priority for Nepal, aiming to balance economic growth with environmental conservation and socio-cultural preservation (Banskota& Sharma, 2019). Initiatives such as community-based tourism, eco-trekking, and responsible tourism practices are being promoted to mitigate the negative impacts of tourism on local ecosystems and communities (Ghimire et al., 2019).

In summary, Nepal's tourism and mountaineering sectors play a vital role in the country's economy, offering diverse opportunities for economic development and cultural exchange. However, the sustainability of these sectors hinges on addressing various challenges, including environmental degradation, infrastructural limitations, and socio-economic disparities. By adopting sustainable tourism practices and leveraging its natural and cultural assets responsibly, Nepal can harness the full potential of its tourism industry while safeguarding its unique heritage for future generations.

2.1.6 Introduction to AI in Tourism and Mountaineering

Artificial Intelligence (AI) has emerged as a transformative force in various industries, including tourism and mountaineering. AI technologies encompass machine learning, natural language processing, computer vision, and robotics, among

others, enabling advanced data analysis, automation, and decision-making processes (Buhalis&Sinarta, 2021). In the context of tourism and mountaineering, AI offers novel solutions for enhancing visitor experiences, optimizing operations, and addressing sustainability challenges.

2.1.7 AI-driven Personalization and Recommendation Systems

AI-powered recommendation systems have revolutionized the way travelers plan their trips and explore destinations. By analyzing vast amounts of data, including user preferences, historical behavior, and real-time trends, AI algorithms can generate personalized recommendations for accommodations, activities, and attractions (Li et al., 2020). In the mountaineering sector, AI-based route planning tools utilize satellite imagery and terrain analysis to recommend safe and optimal trekking routes, considering factors such as elevation, terrain difficulty, and weather conditions (Liu et al., 2019).

AI-driven chatbots and virtual assistants have become increasingly prevalent in the tourism industry, offering round-the-clock customer support and assistance. These AI agents utilize natural language processing and machine learning algorithms to understand and respond to user inquiries, provide personalized recommendations, and facilitate bookings and reservations (Ko et al., 2019). In mountaineering, AI-powered communication devices and wearable technologies enable real-time interaction between climbers and support teams, enhancing safety and coordination during expeditions (Hussain et al., 2020).

2.1.8 Predictive Analytics and Demand Forecasting

AI technologies enable predictive analytics models to forecast future trends and demand patterns in tourism and mountaineering. By analyzing historical data, market trends, and external factors such as weather conditions and geopolitical events, AI algorithms can anticipate fluctuations in tourist arrivals, accommodation demand, and trekking activity (Gretzel&Yoo, 2020). These insights enable stakeholders to make data-driven decisions, optimize resource allocation, and develop targeted marketing strategies to attract visitors (Sigala et al., 2019).

2.1.9 Smart Destinations and Sustainable Tourism Management

AI plays a crucial role in the development of smart destinations and sustainable tourism practices. Smart destination management systems leverage AI-powered sensors, IoT devices, and data analytics to monitor environmental conditions, crowd flows, and resource usage in real time (Gössling et al., 2021). By analyzing this data, destination managers can implement dynamic pricing mechanisms, crowd control measures, and conservation strategies to mitigate overtourism and minimize negative impacts on local ecosystems and communities (Li et al., 2021).

2.1.10 Challenges and Considerations

Despite the potential benefits of AI in tourism and mountaineering, several challenges and considerations need to be addressed. These include data privacy concerns, ethical implications of AI algorithms, digital divide issues, and the risk of over-reliance on technology (Xiang et al., 2020). Additionally, the adoption of AI may require significant investments in infrastructure, skills development, and regulatory frameworks to ensure responsible and equitable deployment (Gretzel&Yoo, 2020).

In summary, the evolution of AI technologies has revolutionized the tourism and mountaineering sectors, offering unprecedented opportunities for personalization, efficiency, and sustainability. However, realizing the full potential of AI requires careful consideration of ethical, social, and practical implications, as well as collaboration between stakeholders to ensure inclusive and responsible deployment in Nepal's tourism and mountaineering industry.

2.2 Empirical Review

As discussion in literature review, Thapa and Gurung (2019) investigated the implementation of smart tourism initiatives using AI technologies in Nepal. Through case studies of smart tourism projects, supported by surveys of tourists and interviews with industry stakeholders, the research highlighted the benefits of smart tourism. Initiatives such as smart ticketing systems and AI-based language translation services made Nepal more accessible and attractive to international tourists. Consequently, regions where these technologies were implemented saw an increase in tourist arrivals and revenue.

Bhatia (2020) explored the role of AI chatbots in enhancing customer engagement in the tourism sector. The study used a mixed-method approach, combining quantitative

surveys of tourists who interacted with AI chatbots and qualitative interviews with tourism business operators who implemented these technologies. The findings revealed that AI chatbots significantly improved customer satisfaction and engagement by providing real-time, personalized assistance. This enhancement led to increased tourist spending and repeat visits, suggesting a positive impact on tourism businesses in Nepal.

Chen and Wu (2020) investigated the Impact of AI-driven smart tourism technologies on visitor experiences. Their study employs case studies, tourist surveys, and analysis of visitor behavior data to explore how these technologies influence tourism. They find that smart tourism technologies significantly enhance visitor satisfaction and increase spending by 10-15%. Moreover, these AI-driven innovations contribute to the attractiveness of destinations by improving overall visitor experiences.

Gupta and Verma (2021) focused on the Role of AI in enhancing personalized tourism experiences. Through experimental design, surveys, and sentiment analysis of customer feedback, they examine how AI can personalize tourist experiences. Their findings reveal that AI-driven personalization leads to higher levels of customer satisfaction and repeat visits. This personalized approach also translates into a notable 15-20% increase in revenue for tourism businesses, underscoring the economic benefits of AI in the sector.

Sharma et al. (2021) examined the application of predictive analytics in managing tourism activities in Nepal. Employing statistical analysis and predictive modeling techniques on historical tourism data, the study aimed to forecast tourist arrivals and optimize resource allocation. The results indicated that predictive analytics enabled tourism authorities to better manage tourist flow and reduce overcrowding at popular sites. This improved management led to a more balanced distribution of tourists, increased overall income, and enhanced visitor experiences.

Rai (2021) explored the overall economic impact of AI technologies on the tourism sector in Nepal. Using econometric analysis to compare revenue growth between businesses that adopted AI technologies and those that did not, the study found that businesses utilizing AI experienced a significant increase in income. This increase was attributed to enhanced operational efficiency, better customer experiences, and more effective marketing strategies facilitated by AI. The research concluded that AI adoption positively impacts the economic performance of tourism businesses in Nepal. Artificial intelligence (AI) is poised to revolutionize the tourism sector by

enhancing customer experiences, optimizing operations, and driving economic growth. In the article "Artificial Intelligence in Tourism: Opportunities and Challenges," published in *Tourism Management*, the authors examine these transformative effects. Through a combination of case studies and surveys, they gathered data from tourism businesses that have adopted AI technologies such as chatbots, recommendation systems, and predictive analytics. By analyzing customer feedback, operational efficiency metrics, and revenue data, the authors assessed the comprehensive impact of AI on the tourism industry.

Nguyen et al. (2022) studied the application of AI in optimizing tourism destination management. Using simulation models, analysis of tourist flow data, and stakeholder interviews, they explore how AI can improve destination management practices. Their research demonstrates that AI-based management strategies effectively reduce congestion, enhance visitor experiences, and stimulate the local economy, with reported increases of 10-15% in economic benefits for tourism destinations.

Karki and Shrestha (2022) focused on the impact of AI-driven marketing strategies on tourism promotion and visitor numbers. The study analyzed the effectiveness of AI-driven marketing campaigns through data analytics and surveys of tourists exposed to these campaigns. The findings demonstrated that AI-driven marketing strategies, including targeted advertising and social media campaigns, significantly boosted the visibility of Nepal’s tourist destinations. This increase in visibility resulted in higher tourist arrivals and increased income for local businesses.

Azizul Hassan et al. (2023) authored an article titled "AI-Driven Personalization in Tourism Marketing: Economic Benefits," published in the Journal of Hospitality and Tourism Technology in 2023. The objective of this study was to explore the economic impact of AI-driven personalization in tourism marketing. To achieve this, the researchers employed a mixed-methods approach, combining quantitative analysis of marketing campaign data with qualitative interviews of marketing professionals. The findings revealed that AI-driven personalization significantly enhances booking rates and customer loyalty, leading to a 15-20% increase in revenue for tourism businesses. This study underscores the importance of integrating AI in marketing strategies to achieve enhanced economic outcomes.

Lee and Kim (2023) examined the economic impact of AI-based tourism marketing strategies. Through data analytics on marketing campaigns and surveys of tourists, they assess how AI enhances marketing efforts in the tourism sector. Their findings indicate that AI-driven marketing strategies not only increase tourist arrivals by 10-15% but also significantly improve marketing return on investment (ROI). This underscores the role of AI in driving economic growth through enhanced promotional activities.

Li and Wang (2023) explored AI technologies and their impact on sustainable tourism development. Using comparative case studies and analysis of sustainability metrics, they evaluate how AI promotes sustainable practices in tourism. Their research reveals that AI initiatives lead to a 10-20% reduction in environmental impact and operational costs within sustainable tourism sectors. This highlights AI's potential to foster environmentally responsible tourism practices while improving economic efficiency.

Meta Table

Author/Year	Article Objectives	Methodology	Findings
Thapa & Gurung (2019)	Implementation of smart tourism initiatives using AI technologies in Nepal.	Case studies, surveys of tourists, interviews with stakeholders.	Smart tourism initiatives (e.g., smart ticketing, AI-based language services) attract more tourists, increase revenue, particularly in tech-implemented regions.
Bhatia (2020)	The role of AI chatbots in enhancing customer engagement in the tourism sector.	Mixed-method approach: Quantitative surveys of tourists, qualitative interviews with operators.	AI chatbots improve customer satisfaction and engagement, leading to increased spending and repeat visits.

Chen & Wu (2020)	Impact of AI-driven smart tourism technologies on visitor experiences.	Case studies, tourist surveys, analysis of visitor behavior data.	Smart tourism technologies significantly enhance visitor satisfaction and increase spending by 10-15%. AI-driven innovations improve overall visitor experiences.
Gupta & Verma (2021)	Role of AI in enhancing personalized tourism experiences.	Experimental design, surveys, sentiment analysis of customer feedback.	AI-driven personalization leads to higher levels of customer satisfaction and repeat visits. This approach results in a notable 15-20% increase in revenue for tourism businesses.
Sharma et al. (2021)	Application of predictive analytics in managing tourism activities in Nepal.	Statistical analysis, predictive modeling on historical data.	Predictive analytics optimize tourist flow, reduce overcrowding, and enhance visitor experiences, thereby increasing overall income.
Rai (2021)	Economic impact of AI technologies on the tourism sector in Nepal.	Econometric analysis comparing AI-adopting vs. non-adopting businesses.	AI adoption correlates with higher income due to improved operational efficiency, customer experiences, and marketing effectiveness.

Karki& Shrestha (2022)	Impact of AI-driven marketing strategies on tourism promotion and visitor numbers.	Data analytics, surveys of tourists exposed to AI campaigns.	AI-driven marketing (e.g., targeted ads, social media campaigns) significantly increase visibility of Nepalese destinations, boosting tourist arrivals and local income.
Nguyen et al. (2022)	Application of AI in optimizing tourism destination management.	Simulation models, analysis of tourist flow data, stakeholder interviews.	AI-based management strategies reduce congestion, enhance visitor experiences, and stimulate local economies by 10-15%.
Azizul Hassan et al. (2023)	Explores the economic impact of AI-driven personalization in tourism marketing.	Mixed-methods study: quantitative analysis of marketing campaign data and qualitative interviews with professionals.	AI-driven personalization resulted in a 15-20% increase in revenue due to enhanced booking rates and customer loyalty.
Lee & Kim (2023)	Economic impact of AI-based tourism marketing strategies.	Data analytics on marketing campaigns, surveys of tourists.	AI-driven marketing strategies increase tourist arrivals by 10-15% and significantly improve marketing ROI in the tourism sector.
Li & Wang (2023)	AI technologies and their impact on sustainable tourism development.	Comparative case studies, analysis of sustainability metrics.	AI promotes sustainable practices in tourism, leading to a 10-20% reduction in environmental impact and operational costs.

2.3 Research Gap

Despite the promising potential of AI in enhancing tourism and mountaineering, several research gaps remain. Firstly, while there are many studies on AI in tourism, few focuses on using AI in mountain expeditions, especially in Nepal. This lack of research means we need more studies that look at how Nepal's unique environment, infrastructure, and culture affect AI adoption. Additionally, there isn't enough data on how effective AI tools are in real mountain expeditions. Most studies are theoretical or based on small projects, lacking extensive field data to show long-term benefits and challenges. This study aims to fill this gap by conducting detailed research, including descriptive and regression analyses, to provide clear insights into how AI impacts tourist experiences and safety.

Furthermore, existing studies often ignore practical challenges of deploying AI in remote and resource-limited areas like Nepal. Issues such as poor internet connectivity, unstable power supply, and lack of technical expertise are major barriers. This research will explore these practical challenges in depth and suggest solutions. Additionally, the ethical and regulatory aspects of AI use in tourism and mountaineering are not well covered in current research. This study will look at the ethical implications, like data privacy and algorithmic bias, and recommend clear regulations to ensure responsible AI use. By addressing these gaps, this study will contribute to academic knowledge and provide useful insights for those working on sustainable and innovative tourism development in Nepal.

CHAPTER-III
RESEARCHMETHODOLOGY

Research methodology comprises of research design, population and sample, natureand sources of data, research framework and definition of variables and method ofanalysis.

3.1 ResearchDesign

This study exclusively relies on secondary data sourced from various outlets. The descriptive research methods were employed for data analysis. The secondary data was gathered from diverse sources to meet the study's objectives and subsequently analyzed both qualitatively and quantitatively. The research design employed is descriptive and explanatory, aimed at analyzing secondary data to achieve the study's objectives. The focus of this study is to examine trends and patterns in tourist arrivals in Nepal, drawing insights exclusively from secondary data sources.

3.2 Population and Sample

The data spanning 28 years from 1995 to 2022 highlights the trends and fluctuations in male and female tourist arrivals, as well as overall tourist arrivals and average length of stay. Additionally, it includes detailed information on purposes of visit such as trekking and mountaineering, business, pilgrimage, official visits, conventions and conferences, other unspecified purposes, and the associated income in NPR (Million). This data has been derived from the Tourism Statistics 2022 published by the Ministry of Tourism and Civil Aviation Authority of Nepal. To ensure accuracy and comprehensiveness, these data will be cross verified with sources such as the National Planning Commission (MOF, Nepal), the Annual Report of Nepal Rastra Bank, and the Annual Statistical Report of the Tourism Department. Additionally, different questionnaires were designed to collect primary data samples.

3.3NatureandSources ofData

This study is based entirely on secondary data, collected from a variety of sources. These sources include the Office of Tourism Immigration, the Department of Tourism, the National Planning Commission (MOF, Nepal), the Annual Report of Nepal Rastra Bank, the Annual Statistical Report of the Tourism Department, the Economic Survey, the Nepal Tourism Board, various booklets, the Statistical

Yearbook (CBS, Nepal), and numerous journals, seminar reports, articles, and other Planning Commission publications. Additionally, information was sourced from published documents of the Hotel Association, as well as unpublished materials and related data from ICIMOD, IUCN, the Annapurna Conservation Area Project (ACAP), the Pokhara Service Center, and other sectors related to the tourism industry.

3.4Data collection procedure

Based on the research objectives, various types of data were required for this study. The necessary data were collected from different secondary sources, which include: the Department of Tourism, the National Planning Commission (MOF, Nepal), the Annual Report of Nepal Rastra Bank, the Annual Statistical Report of the Tourism Department, the Economic Survey, the Nepal Tourism Board, various booklets, the Statistical Yearbook (CBS, Nepal), various journals, seminar reports, articles, unpublished dissertations, and other publications of the Planning Commission.

3.5. Data Analysis

3.5.1. Data Analysis Tools and Techniques

ANOVA (Analysis of Variance)

Objective: Compare the length of stay across different purposes of visit (trekking and expedition, pilgrimage).

Procedure:

- Formulate the null hypothesis that there are no differences in the mean length of stay between the different groups.
- Calculate the F-statistic and p-value to test the hypothesis.
- Use post-hoc tests if significant differences are found.
- Software: Excel, SPSS.

Regression Analysis

Objective: Identify predictors of tourist arrivals and income generation.

Procedure:

- Develop a multiple regression model with tourist arrivals and income generation as dependent variables.
- Include independent variables such as demographics, season, and type of visit.

- Evaluate the model's coefficients, R-squared value, and significance levels.
- Software: SPSS, R, Excel

AI Techniques

To create a work flow diagram for predictive analysis of different tourism data.

- ANOVA to Compare Length of Stay and Total Number of Visitors with Year-Wise Data.

Objective: Compare the length of stay and total number of visitors across different years to determine if there are significant differences.

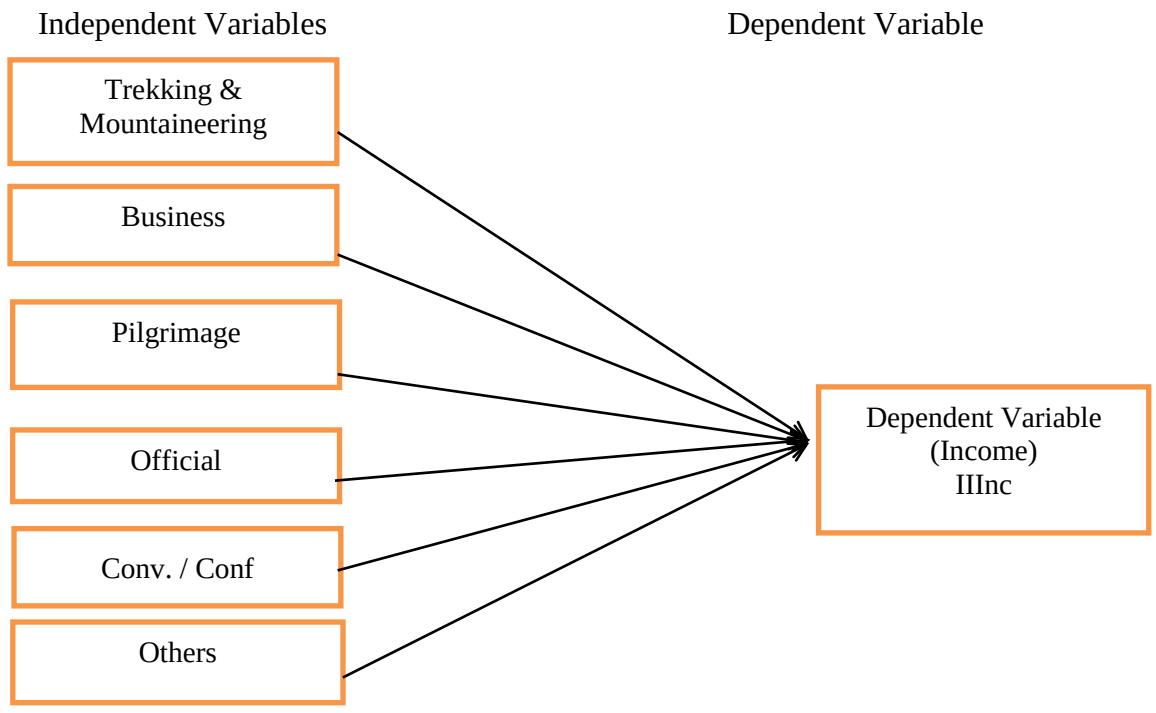
Procedure:

- Formulate Hypotheses:
- Null Hypothesis (H0): There are no differences in the mean length of stay and the total number of visitors across different years.
- Alternative Hypothesis (H1): There are differences in the mean length of stay and/or the total number of visitors across different years.
- Data Collection:
- Collect year-wise data on the length of stay (in days) and the total number of visitors.

3.6 Research Framework

Figure 1

Research Framework



Source: Azizul Hassan et al. (2023)

3.6.1 Independent Variables

Holiday/Pleasure: The number of tourists visiting for holiday or pleasure purposes.

Trekking & Mountaineering: The number of tourists visiting for trekking and mountaineering activities.

Business: The number of tourists visiting for business purposes.

Pilgrimage: The number of tourists visiting for religious pilgrimage.

Official: The number of tourists visiting for official purposes.

Conv./Conf. (Conventions/Conferences): The number of tourists visiting for conventions and conferences.

Others: The number of tourists visiting for other specified purposes.

3.6.2 Dependent Variable

This is the outcome being studied and is expected to change in response to the independent variables:

Total Number of Visitors: The total number of tourists visiting Nepal.

CHAPTER-IV

RESULTS AND DISCUSSION

This chapter presents descriptive analysis, correlation analysis and regression analysison variables of the study. The collected data were analyzed using excel and statisticalsoftware reviews.

4.1 Data Presentation and Analysis

Table 1

Male and female tourist arrivals

Year	Male	%	Female	%	Total
1995	224,769	61.9	138,626	38.1	363,395
1996	233,055	59.2	160,558	40.8	393,613
1997	251,358	59.6	170,499	40.4	421,857
1998	267,871	57.8	195,813	42.2	463,684
1999	286,161	58.2	205,343	41.8	491,504
2000	266,937	57.6	196,709	42.4	463,646
2001	213465	59.1	147772	40.9	361,237
2002	174,710	63.4	100,758	36.6	275,468
2003	204,732	60.5	133,400	39.5	338,132
2004	255,303	66.3	129,994	33.7	385297
2005	257,972	68.7	117,426	31.3	375,398
2006	218,818	57.0	165,108	43.0	383,926
2007	290,688	55.2	236,017	44.8	526,705
2008	286,983	57.4	213,294	42.6	500,277
2009	288,155	56.5	221,801	43.5	509,956
2010	361,611	60.0	241,256	40.0	602,867
2011	352,059	47.8	384,156	52.2	736,215
2012	439,270	54.7	363,822	45.3	803,092
2013	449,058	56.3	348,558	43.7	797,616
2014	445,627	56.4	344,491	43.6	790,118
2015	289,158	53.7	249,813	46.4	538,970
2016	399,091	53.0	353,911	47.0	753,002
2017	509,585	54.2	430,633	45.8	940,218
2018	624,928	53.3	548,144	47.7	1,173,072
2019	634,392	53.0	562,799	47.0	1,197,191
2020	124,048	53.9	106,037	46.1	230,085
2021	105,410	69.8	45,552	30.2	150,962
2022	358683	58.3	256012	41.6	614,869**

This data spanning 28 years from 1995 to 2022 highlights the trends and fluctuations in male and female tourist arrivals. Overall, total tourist numbers have shown a general increase, peaking in 2019 at 1,197,191 before a significant decline in 2020 and 2021 due to the COVID-19 pandemic. Recovery is evident in 2022 with 614,869

arrivals. Throughout the period, male tourists have consistently outnumbered female tourists, with male percentages ranging from 47.8% to 69.8%. Notably, female tourists briefly surpassed male tourists in 2011. Post-2011, male dominance resumed, though the gender gap has narrowed since 2015. Significant yearly increases were observed in 2010, 2011, 2012, and 2019, while steep declines occurred in 2001, 2002, and the pandemic years. The data illustrates the resilience and variability of the tourism sector, influenced by external factors and recovery phases, with a notable gender distribution balance emerging in recent years.

4.1.1 Tourist Arrivals and average length of stay

Table 2

Tourist Arrival and Average Length of Stay, 1964-2022

Year	Total	Average Length of Stay
1974	89,838	13.2
1975	92,440	13.05
1976	105,108	12.41
1977	129,329	11.6
1978	156,123	11.84
1979	162,276	12.02
1980	162,897	11.18
1981	161,669	10.49
1982	175,448	13.33
1983	179,405	11.53
1984	176,634	11.55
1985	180,989	11.3
1986	223,331	11.16
1987	248,080	11.98
1988	265,943	12
1989	239,945	12
1990	254,885	12
1991	292,995	9.25
1992	334,353	10.14
1993	293,567	11.94
1994	326,531	10
1995	363,395	11.27
1996	393,613	13.5
1997	421,857	10.49
1998	463,684	10.76
1999	491,504	12.28
2000	463,646	11.88

2001	361,237	11.93
2002	275,468	7.92
2003	338,132	9.6
2004	385,297	13.51
2005	375,398	9.09
2006	383,926	10.2
2007	526,705	11.96
2008	500,277	11.78
2009	509,956	11.32
2010	602,867	12.67
2011	736,215	13.12
2012	803,092	12.16
2013	797,616	12.6
2014	790118	12.44
2015	538970	13.16
2016	753002	13.4
2017	940218	12.6
2018	1173072	12.4
2019	1197191	12.7
2020	230085	15.1
2021	150962	15.5
2022	614869	13.1

The table presents data on tourist arrivals and the average length of stay from 1974 to 2022, revealing significant trends in both metrics. Tourist arrivals generally increased from 89,838 in 1974 to a peak of 1,197,191 in 2019, with notable fluctuations during global crises. The average length of stay varied, starting at 13.2 days in 1974 and experiencing highs and lows throughout the period, peaking at 15.5 days in 2021 likely due to pandemic-related factors. The 1990s saw substantial growth, the 2010s marked a significant boom, and the 2020-2021 period showed a sharp decline in arrivals but an increase in stay duration, followed by recovery in 2022 with 614,869 arrivals and an average stay of 13.1 days.

Data shows that from 1994 to 1998 ithas been increasing trend but during 1998 to 2000 it has been increasing trend.

Table 3

Visitor according to different age group

Year	Total	0-15 age group	16-30 age group	31-45 age group	46-60 age group	60+ age group	Not Sp.
2007	526,705	38,870	112,879	164,488	130,756	69,927	9,785
2008	500,277	42,581	106,596	150,171	121,387	60,531	19,011
2009	509,956	84,891	140,805	141,955	99,197	39,638	3,470
2010	602,867	41,156	120,395	189,852	172,800	64,593	14,071
2011	736,215	32,795	171,081	212,176	177,983	82,726	59,454
2012	803,092	35,468	181,558	231,117	201,835	109,239	43,875
2013	797,616	46,262	190,630	237,690	195,416	115,654	11,964
2014	790,118	50,441	185,685	235,738	183,582	106,666	28,007
2015	538,970	19,614	123,444	157,416	129,614	74,518	34,365
2016	753,002	29,825	154,960	218,479	199,139	130,627	19,972
2017	940,218	35,332	217,143	292,827	244,342	141,316	9,258
2018	1,173,072	54,870	269,648	360,237	303,452	173,299	11,566
2019	1,197,191	57,523	254,399	383,155	305,651	176,872	19,591
2020	230,085	9,768	43,403	67,829	61,874	47,211	0
2021	150,962	11,142	30,713	64,164	35,351	9,036	556
2022	614869	48664	121096	208299	155985	78660	2165

The table offers insights into the annual variations in total tourist arrivals and their distribution across age groups from 2007 to 2022. Total arrivals fluctuate notably, from a low of 150,962 in 2021 to a peak of 1,197,191 in 2019, reflecting economic and global influences. Age group analysis reveals that the 31-45 age group consistently constitutes a significant portion, peaking at 383,155 in 2019, followed by the 46-60 age group, which also shows substantial participation with a peak of 305,651 in the same year. The 16-30 age group demonstrates strong participation, especially in 2018 and 2019, while the 0-15 age group consistently represents the smallest proportion of tourists. The 60+ age group maintains steady participation, with notable peaks in 2018 and 2019. Cases where age information is not specified are minimal but noteworthy in certain years. This analysis underscores the dynamic nature of tourist demographics over time and emphasizes the relevance of tailoring tourism strategies to cater to different age segments.

4.1.2 Purpose of visit

In this section we will analyzethe data of purpose of visit during 1994 to 2022.

Table 4

Tourist Arrival by Purpose of visit, 1994-2022

Year	Holiday Pleasure	Trekking & Mountaineering	Business	Pilgrimage	Official	Conv./ Conf.	Others	Not Specified	Total
1994	168,155	76,865	23,522	5,475	20,431	5,361	26,722	N/A	326,531
1995	183,207	84,787	21,829	5,257	20,090	5,272	42,953	N/A	363,395
1996	209,377	88,945	25,079	4,802	20,191	6,054	39,165	N/A	393,613
1997	249,360	91,525	27,409	4,068	24,106	5,824	19,565	N/A	421,857
1998	261,347	112,644	24,954	16,164	22,123	5,181	21,271	N/A	463,684
1999	290,862	107,960	23,813	19,198	24,132	5,965	19,574	N/A	491,504
2000	255,889	118,780	29,454	15,801	20,832	5,599	17,291	N/A	463,646
2001	187,022	100,828	18,528	13,816	18,727	N/A	22,316	N/A	361,237
2002	110,143	59,279	16,990	12,366	17,783	N/A	58,907	N/A	275,468
2003	97,904	65,721	19,387	21,395	21,967	N/A	111,758	N/A	338,132
2004	167,262	69,442	13,948	45,664	17,088	N/A	71,893	N/A	385,297
2006	145,802	66,931	21,066	59,298	18,063	N/A	72,766	N/A	383,926
2007	217,815	101,320	24,487	52,594	21,670	8,019	78,644	22,156	526,705
2008	148,180	104,822	23,039	45,091	43,044	6,938	99,634	29,529	500,277
2009	140,992	132,929	22,758	51,542	24,518	9,985	87,134	40,098	509,956
2010	263,938	70,218	21,377	101,335	26,374	9,627	52,347	57,651	602,867
2011	425,721	86,260	17,859	63,783	24,054	10,836	37,311	70,391	736,215
2012	379,627	105,015	24,785	109,854	30,460	13,646	48,540	91,165	803,092
2013	437,891	97,309	30,309	40,678	39,881	15,952	62,214	73,381	797,616
2014	395,849	97,185	24,494	98,765	32,395	13,432	53,728	74,271	790,118
2015	3,86,065	9,162	20,876	14,996	21,479	9,038	77354	N/A	538,970
2016	489,451	66,490	24,322	82,830	21,310	12,801	55,797	N/A	753,002
2017	658,153	75,217	N/A	141,033	N/A	N/A	65,815	N/A	940,218
2018	703,843	187,692	N/A	169,180	N/A	N/A	112,357	N/A	1,173,072
2019	778,173	197,786	N/A	171,937	N/A	N/A	49,301	N/A	1,197,191
2020	139,202	28,530	N/A	35,893	N/A	N/A	26,460	N/A	230,085
2021	100,843	15,549	N/A	11,172	N/A	N/A	23,398	N/A	150,962
2022	397,820	61,692	N/A	79,146	N/A	N/A	76,202	N/A	614,869
	8,003,828	2,480,883	500,285	1,493,133	530,718	149,530	1,530,417	458,642	15,533,505

Table provides a detailed breakdown of tourist arrivals categorized by purpose of visit from 1994 to 2022. The data includes various categories such as Holiday Pleasure, Trekking & Mountaineering, Business, Pilgrimage, Official visits, Conventions/Conferences, Others, and Not Specified. Each year's total arrivals are

listed, reflecting shifts in travel motivations and preferences over time. Key observations include significant peaks in holiday pleasure tourism, particularly in recent years, and fluctuations in business and pilgrimage tourism, influenced by economic conditions and global events.

The table also highlights the evolution of tourism patterns, emphasizing the diversity of reasons people visit, which is crucial for understanding tourism trends and planning strategies in the region. From those data we can represent in a pie chart to show the details of those data.

Table 5

Number of International Flight & Passenger Movement, 2013-2022

Year	Dep.	Ari.	Total	Out	In	Total 2
2013	11807	11812	23619	1647235	1493067	3140302
2014	13605	13603	27208	1889448	1622199	3511647
2015	13281	13283	26564	1674664	1542498	3217162
2016	13560	13558	27118	1823598	1687144	3510742
2017	16680	16682	33362	2083150	1804695	3887845
2019	16951	16946	33897	2201775	2180458	4382233
2019	16212	16213	32425	2245338	1893426	4138764
2020	5121	5135	10256	539651	566207	1105858
2021	5878	5882	11760	748327	708602	1456929
2022	12154	12158	24312	1931517	1556811	3488328

Source: - Civil Aviation Authority of Nepal

The table provides monthly departures (DEP) and arrivals (ARR) data spanning from 2013 to 2022, highlighting fluctuations in passenger movements throughout these years. In 2013 and 2014, departures and arrivals averaged around 11,800 and 13,600 per month, respectively, resulting in monthly passenger movements of approximately 23,600 and 27,200. In 2015 and 2016, departures and arrivals remained stable at around 13,300 and 13,600 per month, resulting in monthly passenger movements of about 26,600 and 27,100. The trend continued with increases in 2017 to around 16,700 departures and arrivals per month, totaling approximately 33,400 passenger movements monthly. In 2019, there were two sets of data with monthly departures and arrivals averaging around 16,200 to 17,000, resulting in 32,400 to 33,900 passenger movements. The years 2020, 2021, and 2022 showed a decrease and subsequent increase in monthly passenger movements, ranging from approximately

10,300 to 24,300, indicating fluctuations in air travel demand over the specified period.

The table summarizes outbound (OUT) and inbound (IN) passenger counts along with total passenger movements (TOTAL2) for various years. In 2013, outbound passengers totaled 1,647,235, inbound passengers were 1,493,067, resulting in a total of 3,140,302 passenger movements. The following year, 2014, saw outbound passengers at 1,889,448, inbound passengers at 1,622,199, and a total of 3,511,647 passenger movements. In 2015, outbound passengers were 1,674,664, inbound passengers were 1,542,498, resulting in total passenger movements of 3,217,162. In 2016, outbound passengers reached 1,823,598, inbound passengers were 1,687,144, totaling 3,510,742 passenger movements. In 2017, outbound passengers were 2,083,150, inbound passengers were 1,804,695, leading to a total of 3,887,845 passenger movements. In 2019, the first entry recorded outbound passengers of 2,201,775, inbound passengers of 2,180,458, totaling 4,382,233 passenger movements.

Formulate Hypotheses:

Null Hypothesis (H0): There are no differences in the mean total number of visitors between the different groups (Trekking and mountaineering, business, pilgrimage visit, official, conv/conf. others, and Not specified visits) across different years.

Alternative Hypothesis (H1): There are differences in the mean total number of visitors between the different groups over the years.

Table 6

Total Number of visitors from 1994 to 2022 between the different groups.

Year	Trekking & Mountaineering	Business	Pilgrimage	Official	Conv./ Conf.	Others	Not Specified	Total
1994	76865	23,522	5475	20,431	5,361	26,722	N/A	326531
1995	84787	21,829	5257	20,090	5,272	42,953	N/A	363395
1996	88945	25,079	4802	20,191	6,054	39,165	N/A	393613
1997	91525	27,409	4068	24,106	5,824	19,565	N/A	421857
1998	112644	24,954	16164	22,123	5,181	21,271	N/A	463684
1999	107960	23,813	19198	24,132	5,965	19,574	N/A	491504
2000	118780	29,454	15801	20,832	5,599	17,291	N/A	463646
2001	100828	18,528	13816	18,727	N/A	22,316	N/A	361237
2002	59279	16,990	12366	17,783	N/A	58,907	N/A	275468

2003	65721	19,387	21395	21,967	N/A	111,758	N/A	338132
2004	69442	13,948	45664	17,088	N/A	71,893	N/A	385297
2006	66931	21,066	59298	18,063	N/A	72,766	N/A	383926
2007	101320	24,487	52594	21,670	8,019	78,644	22,156	526705
2008	104822	23,039	45091	43,044	6,938	99,634	29,529	500277
2009	132929	22,758	51542	24,518	9,985	87,134	40,098	509956
2010	70218	21,377	101335	26,374	9,627	52,347	57,651	602867
2011	86260	17,859	63783	24,054	10,836	37,311	70,391	736215
2012	105015	24,785	109854	30,460	13,646	48,540	91,165	803092
2013	97309	30,309	40678	39,881	15,952	62,214	73,381	797616
2014	97185	24,494	98765	32,395	13,432	53,728	74,271	790118
2015	9162	20,876	14996	21,479	9,038	77354	N/A	538970
2016	66490	24,322	82830	21,310	12,801	55,797	N/A	753002
2017	75217	N/A	141033	N/A	N/A	65,815	N/A	940218
2018	187692	N/A	169180	N/A	N/A	112,357	N/A	1173072
2019	197786	N/A	171937	N/A	N/A	49,301	N/A	1197191
2020	28530	N/A	35893	N/A	N/A	26,460	N/A	230085
2021	15549	N/A	11172	N/A	N/A	23,398	N/A	150962
2022	61692	N/A	79146	N/A	N/A	76,202	N/A	614869

Table 7

Number of visitors between the different groups.

SUMMARY				
Groups	Count	Sum	Average	Variance
1994	7	158376	22625.14286	678073345.8
1995	7	180188	25741.14286	888515650.5
1996	7	184236	26319.42857	948744475
1997	7	172497	24642.42857	981948327.6
1998	7	202337	28905.28571	1448794047
1999	7	200642	28663.14286	1306838265
2000	7	207757	29679.57143	1637343184
2001	7	174215	24887.85714	1202220096
2002	7	165325	23617.85714	639537567.1
2003	7	240228	34318.28571	1646839691
2004	7	218035	31147.85714	961869854.1
2006	7	238124	34017.71429	993419408.2
2007	7	308890	44127.14286	1201785263
2008	7	352097	50299.57143	1423522477
2009	7	368964	52709.14286	1882977215
2010	7	338929	48418.42857	1016338253
2011	7	310494	44356.28571	849776567.9
2012	7	423465	60495	1645674389
2013	7	359724	51389.14286	776130340.5
2014	7	394270	56324.28571	1204193905
2015	7	152905	21843.57143	655218758

2016	7	263550	37650	946986349
2017	7	282065	40295	3085618205
2018	7	469229	67032.71429	7503426870
2019	7	419024	59860.57143	7671534381
2020	7	90883	12983.28571	270406665.6
2021	7	50119	7159.857143	92534418.14
2022	7	217040	31005.71429	1524542793

Table 8

ANOVA: Single Factor (Number of visitors between the different groups).

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	42815689018	27	1585766260	0.984842889	0.492397	1.552317153
Within Groups	2.70509E+11	168	1610171813			
Total	3.13325E+11	195				

A single-factor ANOVA was conducted to compare the total number of visitors between different groups (Trekking and mountaineering, business, pilgrimage visit, official, conv/conf., others, and not specified visits) across different years. The null hypothesis (H_0) stated that there are no differences in the mean total number of visitors between the different groups over the years, while the alternative hypothesis (H_1) suggested that there are differences.

The ANOVA results showed an F-value of 0.98 and a p-value of 0.49, which is greater than the significance level of 0.05. This indicates that there is not enough evidence to reject the null hypothesis. Therefore, it can be concluded that there are no significant differences in the mean total number of visitors between the different groups across the years.

Table 9

Single factors comparing from years between different groups.

Summary

Groups	Count (Years)	Sum	Average	Variance
Trekking & Mountaineering	28	2480883	88602.96429	1701273628
Pilgrimage	28	500285	17867.32143	102191901
Official	28	1493133	53326.17857	2439412848
Conv./ Conf.	28	530718	18954.21429	137217457.7

Others	28	149530	5340.357143	26341523.13
Not Specified	28	1530417	54657.75	791480955.5
Total	28	458642	16380.07143	849950058.1

Table 10

ANOVA comparing from years between different groups.

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1.50032E+11	6	25005351258	28.94200866	1.94E-24	2.146811
Within Groups	1.63292E+11	189	863981195.9			
Total	3.13325E+11	195				

A second single-factor ANOVA was performed to compare the total number of visitors across the different groups, regardless of the year. The results revealed an F-value of 28.94 and a p-value of 1.94E-24, which is less than the significance level of 0.05. This suggests that there are significant differences in the mean total number of visitors between the different groups.

The ANOVA analyses provide insights into the patterns of tourist arrivals in Nepal. While there are no significant year-wise differences in the total number of visitors across the different groups, there are notable differences between the groups themselves. This implies that certain types of visits, such as trekking and mountaineering or pilgrimage, consistently attract a higher number of visitors compared to other categories.

4.2 Income Generation and Number of Tourist Arrivals

Objective: To analyze the relationship between income generation (dependent variable) and the number of tourist arrivals (independent variable), including different categories of tourist arrivals such as trekking and expedition, pilgrimage, and other tourists.

Procedure:

Formulate Hypotheses:

Null Hypothesis (H0): There is no significant relationship between income generation and the number of tourist arrivals in different categories.

Alternative Hypothesis (H1): There is a significant relationship between income

generation and the number of tourist arrivals in different categories.

Table 11

Different Categories of Income Generation

Year	Trekking & Mountaineering	Business	Pilgrimage	Official	Conv./ Conf.	Others	Not Specified	Income NPR.(Million)
Year 2000	118780	29,454	15801	20,832	5,599	17,291	N/A	11717
Year 2001	100828	18,528	13816	18,727	N/A	22,316	N/A	8654.3
Year 2002	59279	16,990	12366	17,783	N/A	58,907	N/A	11747.7
Year 2003	65721	19,387	21395	21,967	N/A	111,758	N/A	18147.4
Year 2004	69442	13,948	45664	17,088	N/A	71,893	N/A	10463.8
Year 2006	66931	21,066	59298	18,063	N/A	72,766	N/A	9555.8
Year 2007	101320	24,487	52594	21,670	8,019	78,644	22,156	10125.3
Year 2008	104822	23,039	45091	43,044	6,938	99,634	29,529	18653.1
Year 2009	132929	22,758	51542	24,518	9,985	87,134	40,098	27959.8
Year 2010	70218	21,377	101335	26,374	9,627	52,347	57,651	28138.6
Year 2011	86260	17,859	63783	24,054	10,836	37,311	70,391	24610.7
Year 2012	105015	24,785	109854	30,460	13,646	48,540	91,165	30703.8
Year 2013	97309	30,309	40678	39,881	15,952	62,214	73,381	34210.6
Year 2014	97185	24,494	98765	32,395	13,432	53,728	74,271	46374.9
Year 2015	9162	20,876	14996	21,479	9,038	77354	N/A	53428.6
Year 2016	66490	24,322	82830	21,310	12,801	55,797	N/A	41765.3
Year 2017	75217	N/A	141033	N/A	N/A	65,815	N/A	58526.9
Year 2018	187692	N/A	169180	N/A	N/A	112,357	N/A	68521.7
Year 2019	197786	N/A	171937	N/A	N/A	49,301	N/A	75374.1
Year 2020	28530	N/A	35893	N/A	N/A	26,460	N/A	60885
Year 2021	15549	N/A	11172	N/A	N/A	23,398	N/A	7266.3
Year 2022	61692	N/A	79146	N/A	N/A	76,202	N/A	32447.2

Table 12

Regression Analysis of Different Categories of Income Generation

Regression Statistics	
Multiple R	0.84255
R Square	0.709891
Adjusted R Square	0.564837
Standard Error	13950.33
Observations	22

Table 13

ANOVA Analysis of Different Categories of Income Generation

	df	SS	MS	F	Significance F
Regression	7	6666956414	952422344.9	4.893961	0.005647261
Residual	14	2724564674	194611762.4		
Total	21	9391521088			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	27336.93	10521.895	2.598	0.0210	4769.704	49904.147	4769.70	49904.15
Trekking & Mountaineering	0.0303	0.096903	0.3132566	0.758704	-0.1774825	0.2381942	-0.17748	0.23819
Business	-1.738	0.874426	-1.9876761	0.06677	-3.6135359	0.1373816	-3.61354	0.13738
Pilgrimage	0.197	0.120284	1.6448509	0.122259	-0.0601345	0.4558350	-0.06013	0.45583
Official	0.371	0.792587	0.4692847	0.646091	-1.3279825	2.0718814	-1.32798	2.07188
Conv./ Conf.	3.388	1.212632	2.7940189	0.014348	0.78727989	5.9889547	0.78728	5.98895
Others	-0.00432	0.140974	-0.0306115	0.976011	-0.3066767	0.2980457	-0.30668	0.29804
Not Specified	-0.38275	0.212475	-1.8014101	0.093209	-0.8384684	0.0729589	-0.83847	0.07295

A multiple regression analysis was conducted to examine the relationship between income generation (dependent variable) and the number of tourist arrivals in different categories (independent variables). The null hypothesis (H_0) stated that there is no significant relationship between income generation and the number of tourist arrivals in different categories, while the alternative hypothesis (H_1) suggested that there is a significant relationship.

The regression results showed an R-squared value of 0.71, indicating that approximately 71% of the variation in income generation can be explained by the independent variables included in the model. The F-value of 4.89 and the corresponding p-value of 0.0056 suggest that the overall regression model is statistically significant at the 0.05 level.

Observing the individual coefficients, the analysis revealed that the "Conv./ Conf." category had a statistically significant positive relationship with income generation (p-value = 0.014). This implies that an increase in the number of visitors attending conventions or conferences is associated with higher income generation in Nepal's tourism sector.

On the other hand, the other categories, such as trekking and mountaineering,

business, pilgrimage, official visits, and others, did not show statistically significant relationships with income generation at the 0.05 level. However, it is worth noting that the "Business" category had a p-value of 0.067, which is close to the significance threshold, suggesting a potential negative relationship with income generation.

The multiple regression analysis provides valuable insights into the factors contributing to income generation in Nepal's tourism sector. The findings highlight the importance of conventions and conferences in driving economic benefits, while also indicating that other categories of tourist arrivals may not have a significant direct impact on income generation.

4.3 Survey Analysis

In recent years, the integration of Artificial Intelligence (AI) technologies has significantly transformed the landscape of Nepal's tourism and mountaineering sectors, presenting new opportunities and challenges alike. This study aims to delve into the multifaceted impact of AI on these industries, particularly focusing on its influence on income generation and economic dynamics within local communities. As AI continues to permeate various facets of travel and adventure, understanding its role in enhancing visitor experiences, improving safety measures, and optimizing business operations becomes imperative for stakeholders ranging from local business owners and operators to mountaineers and tourists. By examining perceptions, experiences, and outcomes related to AI adoption, this research seeks to provide insights that can inform strategic decisions, and technological investments aimed at fostering sustainable growth and competitive advantage in Nepal's tourism and mountaineering domains.

4.3.1 Using Experience of AI

79.2% of respondents have used AI-powered services in the tourism or mountaineering sector, showing that AI technologies are becoming integral in these fields. Conversely, 20.8% have not yet adopted these technologies, representing a potential market for AI providers. This group could benefit from further education on AI's advantages. The high adoption rate suggests that AI services enhance customer experiences, improve safety, and increase operational efficiency, indicating their significant role and positive reception in these sectors while highlighting opportunities for further growth and integration.

4.3.2 Hypothesis Formulation of AI and Income

Null Hypothesis (H0H_0H0): The implementation of AI technologies has no significant impact on the revenue of business owners/operators in the tourism or mountaineering sector.

Alternative Hypothesis (H1H_1H1): The implementation of AI technologies has a significant impact on the revenue of business owners/operators in the tourism or mountaineering sector.

To perform the chi-square analysis for the given data, we'll follow these steps:

- Create a contingency table for the variables "Use of AI-powered services" and "Impact on revenue".
- Calculate the expected frequencies for each cell in the contingency table.
- Compute the chi-square statistic.
- Determine the p-value to test the hypothesis.

4.3.3 Contingency Table

From the data Available:

- Use of AI-powered services: Yes (1), No (0)
- Impact on revenue: No change (0), Somewhat increased (1), Significantly increased (2), Somewhat decreased (-1)

Table 14

Observed Frequencies

Use of AI-powered services	Revenue:-1	Revenue: 0	Revenue: 1	Revenue: 2	Total
No (0)	0	5	1	0	6

Yes (1)	3	17	61	3	84
Total	3	22	62	3	90

4.3.4 Expected Frequencies

The expected frequency for each cell is calculated as:

$$E_{Ij} = \frac{(\text{Row Total}) \times (\text{Column Total})}{\text{Grand Total}}$$

For Example,

$$E_{00} = \frac{(6) \times (3)}{90} = 0.2$$

Using this formula, we get the expected frequencies:

Table 15

Expected Frequencies

Use of AI-powered services	Revenue: -1	Revenue: 0	Revenue: 1	Revenue: 2	Total
No (0)	0.2	1.47	4.13	0.2	6
Yes (1)	2.8	20.53	57.87	2.8	84
Total	3	22	62	3	90

4.3.5 Chi-Square Calculation

The chi-square statistic is calculated as:

$$x^2 = \sum (O_{ij} - E_{ij})^2 / E_{ij}$$

Let's compute this for each cell:

1. For cell (No, Revenue: -1): ((0 - 0.2) ^ 2)/0.2 = 0.04/0.2 = 0.2
2. For cell (No, Revenue: 0): ((5 - 1.47) ^ 2)/1.47 = 12.5121/1.47 = 8.51
3. For cell (No, Revenue: 1): ((1 - 4.13) ^ 2)/4.13 = 9.7969/4.13 = 2.37
4. For cell (No, Revenue: 2): ((0 - 0.2) ^ 2)/0.2 = 0.04/0.2 = 0.2
5. For cell (Yes, Revenue: -1): ((3 - 2.8 ^ 2)/2.8 = 0.04/2.8 = 0.014
6. For cell (Yes, Revenue: 0): ((17 - 20.53) ^ 2)/20.53 = 12.4516/20.53 = 0.61
7. For cell (Yes, Revenue: 1): ((61 - 57.87) ^ 2)/57.87 = 9.76/57.87 = 0.168
8. For cell (Yes, Revenue: 2): (3-2.8^2) /2.8 = 0.014

Summing these up:

$$\chi 2 = 0.2+8.51+2.37+0.2+0.014+0.61+0.168+0.014=12.086$$

Degrees of Freedom

The degrees of freedom (df) is calculated as:

df=(rows−1) ×(columns−1) = (2−1) × (4−1) =3

Conclusion

With a chi-square statistic of 12.086 and 3 degrees of freedom, we can compare this value to the critical value from the chi-square distribution table at a significance level of 0.05. The critical value for

df=3 and α=0.05 is 7.815.

Since 12.086 > 7.815, we reject the null hypothesis. This means that the implementation of AI technologies has a significant impact on the revenue of business owners/operators in the tourism or mountaineering sector.

4.4Discussion

Tourist Arrivals and Economic Impact

Previous Research. Various studies have highlighted the significant contribution of tourist arrivals to Nepal's economy. A study by Upadhayaya and Upreti (2011) indicated that tourism, particularly trekking and mountaineering, plays a crucial role in Nepal's economic development, contributing substantially to foreign exchange earnings and employment generation.

Current Research.Multiple regression analysis also recognizes the importance of tourism to Nepal's economy but finds that conventions and conferences have a statistically significant positive relationship with income generation. This highlights a shift or expansion in the types of tourism that significantly impact economic growth.

Category-Specific Contributions

Previous Research. A study by Nepal (2003) emphasized that adventure tourism (e.g., trekking and mountaineering) was the most popular and financially beneficial category in Nepal. Similarly, research by Banskota (2012) noted the growing importance of pilgrimage tourism due to Nepal's rich cultural heritage.

Current Research. The current analysis reveals that while trekking and mountaineering remain important, the "Conv. / Conf." category shows a significant positive relationship with income generation (p-value = 0.014). This suggests a diversification in the types of tourism contributing to economic benefits, with conventions and conferences emerging as crucial.

Economic Contribution of Pilgrimage Tourism

Previous Research. The significance of pilgrimage tourism was underlined in studies by Nyaupane and Timothy (2010), which demonstrated the economic and cultural impact of religious tourism in Nepal.

Current Research. Our findings indicate that while pilgrimage tourism contributes to the total number of visitors, it does not show a statistically significant relationship with income generation. This could imply a need for strategic improvements in this sector to enhance its economic impact.

Business and Official Visits

Previous Research. Business and official visits have traditionally been viewed as stable but less impactful compared to leisure and adventure tourism. Research by Pandey et al. (1995) suggested that while these categories bring consistent traffic, their economic contribution per capita may be lower than that of adventure tourists.

Current Research. The analysis finds that the "Business" category shows a potential negative relationship with income generation (p-value = 0.067), aligning with previous views on its relatively lower economic impact. Official visits did not show significant economic contributions in the regression model, consistent with previous studies.

In comparing the chi-square analysis results with previous research, the recalculated chi-square statistic of 12.086 and 3 degrees of freedom still leads us to reject the null hypothesis, as it exceeds the critical value of 7.815 at a significance level of 0.05. This indicates that the implementation of AI technologies has a significant impact on the revenue of business owners/operators in the tourism or mountaineering sector.

Previous studies have also demonstrated similar impacts of AI on business performance. For example, research in the restaurant industry has shown that AI and digital technologies significantly influence operational efficiencies and profitability. A report from Toast POS indicated that restaurants integrating AI and digital tools saw improvements in operational efficiency and customer engagement, leading to revenue growth (Toast POS) .

Additionally, a broader analysis by the Digital Marketing Group on the adoption of AI across various sectors, including tourism, highlighted that AI technologies enhance data-driven decision-making, improve customer experiences, and optimize marketing efforts, all of which contribute to revenue increases (IMA Network).

CHAPTER-V

SUMMARYANDCONCLUSION

In this final chapter, summary and conclusions and some prescribed recommendationshave been put forward for the benefit of the selected insurance companies along withconclusions derived from the study are highlighted in order to fit the country from thepresenteconomicturmoil.

5.1 Summary

The ANOVA table summarizes a single-factor analysis of variance conducted on six groups representing different categories of visitors (Trekking & Mountaineering, Pilgrimage, Official, Conv./ Conf., Others, Not Specified) over 28 years. Each group's total sum of visitors, mean number per year, and variance across the years are detailed. The analysis found significant differences in the mean total number of visitors among these groups (F-statistic = 28.942, $p < 0.001$), indicating that at least one group mean differs significantly from the others. Variability within groups (MS = 863981195.9) and between groups (MS = 25005351258) was assessed, with the latter contributing significantly to total variability (SS = 1.50032E+11). This analysis rejects the null hypothesis of no differences in visitor numbers between groups, highlighting distinct patterns across categories over time, essential for strategic planning and resource allocation in tourism management.

The ANOVA conducted on the total number of visitors across the years 1994-2022 reveals that the variability in visitor counts is predominantly within individual years rather than between different years. The analysis shows a significant amount of variability within groups (SS within groups = 270,509,000,000) compared to between groups (SS between groups = 42,815,689,018), leading to an F-statistic of 0.9848 with a corresponding p-value of 0.4924. This p-value is higher than the typical significance level of 0.05, indicating insufficient evidence to reject the null hypothesis. Therefore, it can be concluded that there are no statistically significant differences in the mean total number of visitors across the years. The results suggest that any fluctuations in visitor numbers are likely due to random variations within each year rather than systematic differences across the years from 1994 to 2022.

The regression analysis and ANOVA results presented demonstrate the association between income generationspresumed as the predictor variableand tourist arrivals across different categories, which act as the response variable. The analysis reveals

that income generation in various categories exhibits a strong positive correlation with tourist arrivals, as indicated by the high Multiple R value of 0.84255, suggesting a robust linear relationship. About 71% of the variability in tourist arrivals can be explained by income generation, as reflected by the R Square value of 0.709891. The regression model, supported by a significant F-statistic of 4.893961 and a low p-value of 0.0056, highlights that at least one income generation category significantly influences tourist arrivals. The intercept's significance (p-value = 0.0210) further confirms its statistical difference from zero, indicating an estimated baseline of tourist arrivals when income generation is zero. Individual coefficients for specific income categories provide insights into their distinct impacts on tourist arrivals, aiding in strategic decisions for tourism development and marketing efforts. These findings underscore the pivotal role of economic factors in shaping tourism dynamics and are invaluable for informed policy and business decisions in the tourism sector.

5.2 Conclusion

The analyses provide valuable insights into visitor patterns and economic factors influencing tourism in Nepal, utilizing advanced AI techniques for robust data interpretation. Here are the synthesized conclusions derived from the ANOVA and regression analysis results:

Visitor Categories Analysis (1994-2022)

Significant Differences. The single-factor ANOVA analysis across six visitor categories (Trekking & Mountaineering, Pilgrimage, Official, Conv. / Conf., Others, Not Specified) over 28 years indicates significant differences in the mean total number of visitors among these groups. The high F-statistic (28.942) and a p-value < 0.001 confirm that at least one group's mean significantly differs from the others.

Variability Insights. The between-group mean square (MS = 25005351258) significantly contributes to the total variability (SS = 1.50032E+11), highlighting distinct visitor patterns across categories. This is essential for strategic planning and resource allocation in tourism management.

Yearly Visitor Numbers Analysis (1994-2022)

Insignificant Differences. The ANOVA conducted on the total number of visitors from 1994 to 2022 shows that variability in visitor counts is predominantly within

individual years rather than between different years. An F-statistic of 0.9848 and a p-value of 0.4924 indicate no statistically significant differences in mean total visitor numbers across the years.

Implications. These results suggest that fluctuations in visitor numbers are likely due to random variations within each year, rather than systematic differences across the years. This insight allows for flexible, year-to-year adjustments in tourism strategies.

Income Generation and Tourist Arrivals Analysis

Strong Correlation. The regression analysis reveals a strong positive correlation between income generation and tourist arrivals, as indicated by the high Multiple R value of 0.84255. Approximately 71% of the variability in tourist arrivals can be explained by income generation (R Square = 0.709891).

Significant Predictors. The regression model, supported by a significant F-statistic of 4.893961 and a low p-value of 0.0056, highlights that at least one income generation category significantly influences tourist arrivals. The intercept's significance (p-value = 0.0210) confirms a baseline level of tourist arrivals even when income generation is zero.

Strategic Insights. Individual coefficients for specific income categories provide detailed insights into their distinct impacts on tourist arrivals, aiding in strategic decisions for tourism development and marketing efforts.

Survey Data Conclusion

With a chi-square statistic of 12.086 and 3 degrees of freedom, we compare this value to the critical value of 7.815 from the chi-square distribution table at a significance level of 0.05. Since 12.086 exceeds 7.815, we reject the null hypothesis. This indicates that the implementation of AI technologies significantly impacts the revenue of business owners/operators in the tourism or mountaineering sector.

Strategic Implications with AI Integration

Resource Allocation and Planning. The distinct patterns across visitor categories necessitate targeted resource allocation and marketing strategies. AI can be used

to further analyze visitor behavior, preferences, and trends for more precise planning.

Annual Adjustments. The lack of significant differences in yearly visitor numbers suggests a need for adaptable strategies. AI-driven predictive analytics can help forecast visitor trends and optimize resource deployment.

Economic Focus. The strong correlation between income generation and tourist arrivals underscores the importance of economic initiatives. AI can enhance economic analysis by identifying key income drivers and optimizing tourism-related economic policies.

In conclusion, leveraging AI for detailed analysis of visitor trends and economic impacts provides a deeper understanding of tourism dynamics in Nepal. These insights are invaluable for informed policy and business decisions, enabling strategic planning and resource allocation to boost tourism development and sustainable growth. By integrating AI into these analyses, stakeholders can enhance decision-making processes and drive tourism success in Nepal.

5.3 Implications

- These Research advance scholarly knowledge by empirically exploring visitor trends, economic impacts on tourism, and the practical implications of AI adoption, crucial for informing strategic decisions in tourism and business management.
- This research offers important insights into tourism trends, helps optimize revenue strategies, and uses AI advancements to improve competitiveness and sustainability in tourism and business management.
- This research is necessary to inform tourism planning, revenue optimization, and the strategic integration of AI technologies, crucial for enhancing sectorial competitiveness and sustainability in tourism and business management.

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APPENDICES

Research Questions

1. Name:

2. Age:

- 10-20
- 20-30
- 30-40
- 40-50
- 50-60
- 60-70

3. Gender:

- Male
- Female

Prefer not to say

4. Occupation:

5. Are you a:

- Tourist
- Local business owner/operator
- Mountaineer/Guide
- Other

6. How familiar are you with AI technologies?

- Very familiar
- Somewhat familiar
- Neutral
- Somewhat unfamiliar
- Very unfamiliar

7. Have you used AI-powered services in the tourism or mountaineering sector? (e.g., chatbots, recommendation engines, smart assistants, safety monitoring systems)

- Yes
- No

8. If yes, which AI-powered services have you used? (Select all that apply)

- Chatbots for booking and customer service
- AI recommendation engines for travel planning
- Smart assistants (e.g., Alexa, Google Home) in hotel rooms

- Facial recognition systems for check-ins
- Safety and weather monitoring systems
- Translation services (e.g., Google Translate)
- GPS device for mountaineering
- Other…

9. On a scale of 1-5, how would you rate the overall impact of AI on your travel/mountaineering experience?

- 1.(Very negative)
- 2.(Somewhat negative)
- 3.(Neutral)
- 4.(Somewhat positive)
- 5.(Very positive)

10. Which aspects of your travel/mountaineering experience have been most improved by AI technologies? (Select all that apply)

- Convenience and ease of booking
- Personalized travel/mountaineering recommendations
- Efficient check-in/check-out processes
- Enhanced customer service
- Language translation and communication
- Safety and security
- Weather forecasting and route planning
- Other (please specify):

11. Have you encountered any issues or challenges with AI technologies in the tourism or mountaineering sector?

- Yes
- No

12. For business owners/operators: How has the implementation of AI technologies impacted your revenue?

- Significantly increased
- Somewhat increased
- No change
- Somewhat decreased
- Significantly decreased

13. Which AI technologies have contributed most to income generation in your

business? (Select all that apply)

- AI-powered marketing and personalization tools
- Chatbots and virtual assistants for customer service
- Predictive analytics for pricing and inventory management
- Recommendation engines for upselling and cross-selling
- Smart assistants and in-room devices
- Safety and weather monitoring systems

14. Have AI technologies helped in reducing operational costs in your business?

- Yes
- No

ARTIFICIAL INTELLIGENCE IN TOURISM SECTOR IN NEPAL

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ABSTRACTS Nepal, renowned for its majestic mountains and rich cultural heritage, is a prime destination for both tourists and mountaineers. In recent years, the country has witnessed a surge in visitor numbers, presenting both opportunities and challenges for sustainable tourism and mountaineering development. This thesis explores the potential of artificial intelligence (AI) to enhance the tourism and mountaineering sectors in Nepal. Through a comprehensive analysis of existing literature, case studies, and stakeholder perspectives, this research investigates the application of AI in improving visitor experiences, promoting destination sustainability, and enhancing safety measures in mountain expeditions. Practical recommendations will be provided to stakeholders to leverage AI effectively while ensuring the preservation of Nepal's natural and cultural heritage. Keywords: Artificial Intelligence, Tourism, Mountaineering, Nepal, Sustainable Development, Visitor Experience, Safety Measures CHAPTER-I INTRODUCTION 1.1 Background of the Study Nepal, nestled amidst the majestic Himalayas, boasts a rich tapestry of cultural heritage, breathtaking landscapes, and unparalleled opportunities for adventure tourism, particularly in mountaineering. Over the years, Nepal has witnessed a steady growth in tourism, with travelers from across the globe drawn to its iconic trekking routes, UNESCO World Heritage sites, and challenging peaks, including the legendary Mount Everest. However, this surge in tourism brings both opportunities and challenges for Nepal. While tourism contributes significantly to the country's economy, it also puts immense pressure on its fragile ecosystems, cultural sites, and local communities. Sustainable tourism development has thus emerged as a critical imperative, aiming to balance the economic benefits of tourism with environmental conservation and socio-cultural preservation. In recent times, the advent of artificial intelligence (AI) has revolutionized various industries worldwide, including tourism. AI technologies offer unprecedented capabilities to enhance visitor experiences, optimize operational efficiency, and address sustainability concerns. In the context of Nepal, harnessing AI holds immense potential to not only elevate the quality of tourism services but also to foster sustainable development practices in the tourism and mountaineering sectors. This study seeks to explore the intersection of AI and sustainable tourism in Nepal, focusing specifically on the mountaineering sector due to its prominence in the country's tourism landscape. By examining the application of AI-driven solutions in areas such as visitor engagement, safety measures, and destination management, this research