

HOW ARTIFICIAL INTELLIGENCE (AI) IS
TRANSFORMING TOURISM INDUSTRY

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BY

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A final year project submitted in partial fulfilment of the
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DECLARATION

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- (2) No portion of this FYP has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.
- (3) Sole contribution has been made by me in completing the FYP.
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TABLE OF CONTENTS

COPYRIGHT PAGE	III
DECLARATION	IV
ACKNOWLEDGEMENT	V
TABLE OF CONTENTS	VI
LIST OF TABLES	X
LIST OF FIGURES	XI
LIST OF ABBREVIATIONS	XII
LIST OF APPENDICES	XIII
PREFACE	XIV
ABSTRACT	XV
CHAPTER 1: INTRODUCTION	1
1.0 INTRODUCTION	1
1.1 BACKGROUND OF STUDY	1
1.2 RESEARCH PROBLEM	3
1.3 RESEARCH QUESTIONS	4
1.4 RESEARCH OBJECTIVES	5
1.4.1 GENERAL OBJECTIVES	5
1.4.2 SPECIFIC OBJECTIVES	5
1.5 SIGNIFICANCE OF STUDY	5
1.6 CONCLUSION	6
CHAPTER 2: LITERATURE REVIEW	7
2.0 INTRODUCTION	7
2.1 UNDERLYING THEORIES	7
TECHNOLOGY ACCEPTANCE MODEL (TAM)	7

2.2 REVIEW OF LITERATURE	9
2.2.1 INDEPENDENT VARIABLE: CHATBOTS AND VOICE ASSISTANTS (CVA)	9
2.2.2 INDEPENDENT VARIABLE: PERSONALIZATION AND RECOMMENDER SYSTEMS (PRS)	11
2.2.3 INDEPENDENT VARIABLE: LANGUAGE TRANSLATION APPLICATIONS (LTA)	13
2.2.4 INDEPENDENT VARIABLE: DEVICES AND INTEGRATED SYSTEMS (DIS)	15
2.2.5 DEPENDENT VARIABLE: TRANSFORMATION OF TOURISM INDUSTRY (TTI)	17
2.3 CONCEPTUAL FRAMEWORK	18
2.4 HYPOTHESIS DEVELOPMENT	19
2.5 CONCLUSION	19
CHAPTER 3 : RESEARCH METHODOLOGY	20
<hr/>	
3.0 INTRODUCTION	20
3.1 RESEARCH DESIGN	20
3.1.1 DESCRIPTIVE AND CAUSAL RESEARCH	20
3.1.2 QUANTITATIVE RESEARCH	21
3.2 SAMPLING DESIGN	21
3.2.1 TARGET POPULATION	22
3.2.2 SAMPLING FRAME AND LOCATION	22
3.2.3 SAMPLING TECHNIQUES	23
3.2.4 SAMPLE SIZE	23
3.3 DATA COLLECTION METHOD	24
3.3.1 PRIMARY DATA COLLECTION	24
3.4 RESEARCH INSTRUMENTS	25
3.4.1 QUESTIONNAIRE DESIGN	25
3.4.2 PILOT STUDY	26
3.5 CONSTRUCT MEASUREMENT	27
3.5.1 CONSTRUCTS ORIGIN	27
3.5.2 SCALE MEASUREMENT	28
3.5.2.1 Nominal Scale	31
3.5.2.2 Ordinal Scale	32
3.6 DATA ANALYSIS TECHNIQUES	32
3.6.1 DESCRIPTIVE ANALYSIS	33
3.6.2 INTERNAL RELIABILITY ANALYSIS	33
3.6.3 INFERENCE ANALYSIS	34
3.6.3.1 Pearson Correlation Coefficient	34
3.6.3.2 Multiple Regression Analysis	35
3.7 CONCLUSION	36
CHAPTER 4: DATA ANALYSIS	37
<hr/>	
4.0 INTRODUCTION	37
4.1 DATA COLLECTION PROCESS AND RESPOND RATES	37

4.2 DESCRIPTIVE ANALYSIS	37
4.2.1 RESPONDENT'S DEMOGRAPHIC PROFILE	38
4.2.1.1 Gender	38
4.2.1.2 Age	39
4.2.1.3 Education	40
4.2.1.4 Income Level	41
4.2.1.5 Travel Behavior (local/international)	42
4.2.1.6 How familiar are you with the concept of Artificial Intelligence (AI)?	43
4.2.1.7 Have you had past experience with Artificial Intelligence (AI) related to tourism?	44
4.2.1.8 Which Artificial Intelligence (AI) related to tourism have you heard of/experience before?	44
4.2.2 CENTRAL TENDENCIES OF MEASUREMENT	45
4.2.2.1 Mean and Standard Deviation of Chatbots and Voice Assistants (IV)	45
4.2.2.2 Mean and Standard Deviation of Personalization and Recommender Systems (IV)	46
4.2.2.3 Mean and Standard Deviation of Language Translation Applications (IV)	48
4.2.2.4 Mean and Standard Deviation of Device and Integrated Systems (IV)	49
4.2.2.5 Mean and Standard Deviation of Transformation of Tourism Industry (DV)	50
4.3 RELIABILITY TEST	51
4.4 INFERENTIAL ANALYSIS	52
4.4.1 PEARSON CORRELATION COEFFICIENT	52
4.4.2 MULTIPLE REGRESSION ANALYSIS	52
4.4.2.1 Model Summary	52
4.4.2.2 ANOVA	53
4.4.2.3 Coefficients	54
4.5 HYPOTHESIS TESTING	55
4.5.1 CHATBOTS AND VOICE ASSISTANTS	55
4.5.2 PERSONALIZATION AND RECOMMENDER SYSTEMS	55
4.5.3 LANGUAGE TRANSLATION APPLICATIONS	56
4.5.4 DEVICES AND INTEGRATED SYSTEMS	56
4.6 CONCLUSION	57
CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS	58
5.0 INTRODUCTION	58
5.1 DISCUSSION OF MAJOR FINDING	58
5.1.1 RELATIONSHIP BETWEEN CHATBOTS AND VOICE ASSISTANTS AND TRANSFORMATION OF TOURISM INDUSTRY	59
5.1.2 RELATIONSHIP BETWEEN PERSONALIZATION AND RECOMMENDER SYSTEMS AND TRANSFORMATION OF TOURISM INDUSTRY	59
5.1.3 RELATIONSHIP BETWEEN LANGUAGE TRANSLATION APPLICATIONS AND TRANSFORMATION OF TOURISM INDUSTRY	60
5.1.4 RELATIONSHIP BETWEEN DEVICES AND INTEGRATED SYSTEMS AND TRANSFORMATION OF TOURISM INDUSTRY	61
5.2 IMPLICATIONS OF THE STUDY	61

5.2.1 THEORETICAL IMPLICATIONS	62
5.2.2 PRACTICAL IMPLICATIONS	62
5.3 LIMITATIONS OF THE STUDY	63
5.3.1 IMBALANCED DEMOGRAPHIC INFORMATION OF RESPONDENTS	63
5.3.2 LANGUAGE BARRIER FOR DATA COLLECTION	64
5.4 RECOMMENDATION FOR FUTURE RESEARCH	65
5.4.1 IMPLEMENT STRATA SAMPLING TECHNIQUE	65
5.4.2 IMPLEMENT MULTILINGUAL QUESTIONNAIRES WITH LANGUAGE OPTIONS	66
5.5 CONCLUSION	66
REFERENCES	67
<hr/>	
APPENDICES	78
<hr/>	
APPENDIX 3.1: ETHICAL APPROVAL FOR RESEARCH PROJECT/PROTOCOL	78
APPENDIX 3.2: QUESTIONNAIRE	81
APPENDIX 4.1: PILOT TEST RESULTS (SPSS)	91
APPENDIX 4.2: PEARSON CORRELATION COEFFICIENT RESULTS (SPSS)	93

LIST OF TABLES

	Page
Table 3.1: Summary of Reliability Test Result in Pilot Test	27
Table 3.2: Origin of Construct (Questionnaire)	27
Table 3.3: Level of Scale Measurement	28
Table 3.4: Cronbach's Alpha Rule of Thumb	34
Table 3.5: Pearson Correlation Coefficient Value	35
Table 4.1: Gender	38
Table 4.2: Age	39
Table 4.3: Education	40
Table 4.4: Income Level	41
Table 4.5: Travel Behavior	42
Table 4.6: Mean and Standard Deviation (CVA)	45
Table 4.7: Mean and Standard Deviation (PRS)	46
Table 4.8: Mean and Standard Deviation (LTA)	48
Table 4.9: Mean and Standard Deviation (DIS)	49
Table 4.10: Mean and Standard Deviation (TTI)	50
Table 4.11: Summary of Reliability Test in Full Study	51
Table 4.12: Pearson Correlation Coefficient	52
Table 4.13: Model Summary	52
Table 4.14: ANOVA	53
Table 4.15: Coefficients	54
Table 5.1: Hypothesis Table	58
Table 4A.1: CVA's Pilot Test's Cronbach's Alpha	91
Table 4A.2: PRS's Pilot Test's Cronbach's Alpha	91
Table 4A.3: LTA's Pilot Test's Cronbach's Alpha	91
Table 4A.4: DIS's Pilot Test's Cronbach's Alpha	91
Table 4A.5: TTI's Pilot Test's Cronbach's Alpha	92
Table 4A.6: Pearson Correlation Coefficient	93

LIST OF FIGURES

	Page
Figure 2.1: Proposed Conceptual Framework	18
Figure 4.1: Gender	38
Figure 4.2: Age	39
Figure 4.3: Education	40
Figure 4.4: Income Level	41
Figure 4.5: Travel Behavior	42
Figure 4.6: Familiarity with the concept of AI	43
Figure 4.7: Experience with AI related to tourism	44
Figure 4.8: AI related to tourism that respondents heard of/experience before	44

LIST OF ABBREVIATIONS

AI	Artificial Intelligence
CVA	Chatbots and Voice Assistants
DIS	Device and Integrated Systems
DV	Dependent Variable
H1	Hypothesis 1
H2	Hypothesis 2
H3	Hypothesis 3
H4	Hypothesis 4
IV	Independent Variable
IVs	Independent Variables
LTA	Language Translation Applications
PRS	Personalization and Recommender Systems
SPSS	Statistics Package for Social Science
TTI	Transformation of Tourism Industry

LIST OF APPENDICES

	Page
Appendix 3.1: Ethical Approval For Research Project/Protocol	78
Appendix 3.2 Questionnaire	81
Appendix 4.1: Pilot Test Results (SPSS)	91
Appendix 4.2: Pearson Correlation Coefficient Results (SPSS)	93

PREFACE

In the current era, the advancement of technologies, such as Artificial Intelligence (AI) stands out as one of the most transformative forces across industries worldwide. Its impact extends far beyond the realms of science and innovation, spreading through in our everyday lives. Within this booming of innovation, the tourism industry stands as a prime example of an arena undergoing significant evolution, provided by AI.

In this research, I embarked on a journey to explore the multifaceted ways in which AI is transforming the tourism industry. This journey led me to uncover a wealth of insights, such as enhancement of customer experiences and increase in customer engagements. Through a detailed analysis and exploration, the complexities and the degree of dynamic relationship between AI and tourism is discussed. Moreover, not only the current state of affairs is being discussed, a forward-looking perspective on the future of the AI in tourism industry will also be provided. This preface serves as an introductory gateway into the realm of AI-driven transformation within the tourism industry. It is my hope that this research will not only contribute to the existing body of knowledge but also spark conversations and inspire further exploration into the boundless possibilities that lie ahead.

With curiosity as my compass and knowledge as a guide, let's explore how AI is transforming tourism industry together.

ABSTRACT

AI-driven big data analysis is transforming the tourism industry. This study focuses on AI's impact on the tourism industry from tourists' perspectives, filling a significant research gap. The general objective of this study is to examine how AI is transforming the tourism industry. With this aim, the primary data is collected through self-administered questionnaires from a convenience sample of 402 respondents on different social media platforms. Besides, the IBM Statistics Package for Social Science (SPSS) is used to test the proposed hypotheses in this study and the Technology Acceptance Model (TAM) is utilized to investigate the implementation of chatbots and voice assistances, personalization and recommender systems, language translation applications, and device and integrated systems towards the transformation of tourism industry. Based on the findings of this study, it reveals that chatbots and voice assistants, personalization and recommender systems, language translation applications, and device and integrated systems have a positive significant relationship with transformation of tourism industry. As a conclusion for this study, ease of usage and usefulness of a new technology is crucial. Moreover, this study is offering valuable insights and practical recommendations based on tourist perspectives for industry practitioners. Hence, this study has the potential to contribute to the initiation of enhanced AI systems and tourism industry that fosters economic growth and enhances consumer satisfaction.

CHAPTER 1: INTRODUCTION

1.0 Introduction

Chapter 1 introduces the background of research and the problem statement that grabs researchers' interest and motivates them to investigate it further. The chapter further continues with research objectives and general and specific versions of research questions. At the end of this chapter, it covers the importance of research and a conclusion.

1.1 Background of Study

Big data analysis has become more popular recently in several industries as companies depend more and more on insights from massive amounts of data. The large and diverse datasets that are common today are difficult for traditional data techniques and platforms to analyze effectively, particularly in real-life scenarios where customer engagement is critical. Since the tourism industries depend on the interpretation and analysis of significant amounts of multimodal data, such as numerical, categorical, time-series, image, and text data (Samara et al., 2020). The complicated process of obtaining information from this enormous data set demands advanced analytical methods.

The necessity for new theoretical and analytical frameworks to convert potential chaos into valuable information has been further highlighted by the COVID-19 crisis. While discussions about data analytics and experimentation have been ongoing, new developments in artificial intelligence (AI) technologies, which mimic human

cognitive processes like learning and problem-solving have given these discussions fresh angles. AI algorithms have a significant impact on several industries, including psychology, space exploration, healthcare, marketing, and finance. They demonstrate a remarkable capacity to learn from data, identify meaningful patterns, and predict events (Pannu, 2015, Doborjeh et al., 2021, Doborjeh et al., 2018).

The impact of AI is constantly growing on a global scale, fostering innovation and lessening the need for human-led processes in businesses. AI is being incorporated more and more into different business functions like marketing, sales, customer service, and finance. The tourism industry has grown significantly in the 21st century, and the predicted foreign visitor arrivals rate increased from 24.1% in 2023 to 27.2% in 2027 (Statista, 2023) Many people are willing to spend money on travel and tourism these days. Thus, as to improve the tourism industry, AI has been warmly welcomed to embrace the industry.

Every aspect of the tourism industry is currently developing and testing AI applications, such as chatbots and voice recognition, personalization and recommender systems, language translation applications, and robots. For several reasons, the tourism industry is particularly relevant to AI. Travelers have several decisions to make regarding their upcoming travels, including their main destination, ways of transportation, location of accommodation, and things to do. The choices made will impact the level of satisfaction of the tourists. Thus, AI is becoming so important that it is being utilized to interact with customers and improve the engagement level (Revfine, n.d.). Thus, the goal of this perspective is to illustrate how AI technology has transformed the tourism industry.

1.2 Research Problem

In the 21st century, rapid technological advancements have particularly brought up the development of AI in various industries. This technological innovation has led to substantial changes across diverse sectors, including the tourism industry. The advent of AI is revolutionizing how the tourism sector operates. AI-driven solutions are becoming integral to enhancing the overall travel experience. However, although they frequently make travel more convenient, it is unclear if this will always lead to better experiences or occasional new difficulties. For example, travelers can now learn more about the place of attractions thanks to personalized recommendation systems, such as Google. In contrast, this will caused travelers no longer need to rely on travel agencies for assistance when planning their trips.

In this current era, AI has been applied widely in the tourism and service sectors. Nonetheless, previous research has been focusing on examining the impact of AI from a business-centric viewpoint, often overlooking the perspective of tourists. There is an absence of research that has an observed on the AI systems with tourism industry based on the tourist perspectives. For example, Stylianos (2021) is investigating the industry based on business-centric viewpoint. Thus, there remains a notable gap in understanding how AI affects the tourism experience from the perceptions of tourists themselves.

Moreover, existing studies provide valuable insights, but most of them are theoretical research and lack of comprehensive scientific evidence. One of the key gaps in previous research is the lack of the information from a qualitative research point of view to persuade the significant relationship observed. This absence hinders a comprehensive understanding of the phenomenon under study and limits the validity of conclusions drawn from quantitative findings alone.

Furthermore, some research endeavors incorporate variables that others do not, thereby potentially influencing the observed outcomes and conclusions. For example, the research of Doborjeh et al. (2021) is focusing on robots and chatbots only, while Stylianos (2021) is focusing on the research of recommender systems and translation systems. Thus, a comprehensive examination that considers a wide range of relevant variables to provide a detail understanding of the phenomenon.

In short, this study aims to present a research framework outlining how artificial intelligence is transforming the tourism industry to meet theoretical and practical needs. The framework is to assist travelers to predict how AI will advance in the tourism industry.

1.3 Research Questions

While considering the research problem above, the objective of this study is to answer the research questions below:

- Is there any relationship between chatbots and voice assistants and transformation of tourism industry?
- Is there any relationship between personalization and recommender systems and transformation of tourism industry?
- Is there any relationship between language translation applications and transformation of tourism industry?
- Is there any relationship between device and integrated systems and transformation of tourism industry?

1.4 Research Objectives

1.4.1 General Objectives

In this study, the main goal is to investigate how AI is transforming tourism industry.

1.4.2 Specific Objectives

- To investigate the relationship between chatbots and voice assistants and transformation of tourism industry.
- To investigate the relationship between personalization and recommender systems and transformation of tourism industry.
- To investigate the relationship between language translation applications and transformation of tourism industry.
- To investigate the relationship between device and integrated systems and transformation of tourism industry.

1.5 Significance of Study

The significance of our study lies in its improved comprehension of the variables influencing the transformation of the tourism industry. It advances our understanding of the potential benefits of AI systems in transforming the tourism industry, such as chatbots and voice assistants, personalization and recommender systems, language translation applications, and robots. The purpose of this research is to contribute numerous insights into how AI technologies are specifically impacting tourists' experiences and interactions within the tourism industry.

This study can assist tourist in comprehending the implications of AI which enable them to make knowledgeable choices, leverage technology to augment their journey experiences, and recognize the possible obstacles linked to the integration of AI. Furthermore, once tourists understand more about AI, they have a quick resolution of issues and emergencies faced during their travels with the help of AI, ensuring a smoother and safer experience. In addition, the study guides tourists to have a better understanding of future trends and predictions with the help of AI. The AI systems could anticipate travel trends, demand fluctuations, and external factors such as weather patterns. This could help tourist with their choice of accommodation, destination, and transportation.

In conclusion, this study will be helpful to a wide range of people by determining the effects of the relevant variables on the transformation of tourism industry and offering some recommendations to increase the service quality of tourism.

1.6 Conclusion

The background of AI has been provided, along with a summary of its effects on the tourism industry. In addition, a few research questions and objectives are provided for the topic in this chapter. As a result, this chapter serves as an introduction to the subsequent chapters, which will discuss the variables in greater detail and offer supporting data in the next chapter.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

Chapter 2 discusses the opinions of other researchers regarding the subject of this study. First, this chapter starts with an investigation of the underlying theories related to this study. This chapter's second section is the literature review on the transformation of the tourism industry along with its relevant variables like chatbots and voice assistants, personalization and recommender systems, language translation applications and devices, and integrated systems. Later, this chapter subsequently develops the conceptual framework and hypothesis development to examine how the above-mentioned AI systems are transforming the tourism industry.

2.1 Underlying Theories

Technology Acceptance Model (TAM)

Based on Davis et al. (1989), the Technology Acceptance Model (TAM) is a useful framework for evaluating how people will adopt new technologies. The purpose of TAM was to explain the intentions of users to choose a particular technology across a wide range of technologies for better task performance and to provide insight into the factors behind technology acceptance generally (Davis et al., 1989).

This model provides insightful information about how technology is accepted in contexts involving both products and processes. However, since the advent of TAM, researchers have extended and modified the model, to investigate user adoption of a broad variety of information technologies, including word

processors and email, (Go et al., 2020; Goh & Wen, 2020; Venkatesh & Davis, 2000). Thus, TAM has grown to be one of the most significant and impactful extensions of the Theory of Reasoned Action introduced by Ajzen & Fishbein (1980).

TAM aims to explain the usage of a technology are determining on the two main factors of technology adoption, which includes (1) perceived usefulness (PU) and (2) perceived ease of use (PEU) (Davis *et al.*, 1989). PU is known as the degree which an individual believes that utilizing a particular technology can improve one's daily performance (Davis, 1989). PEU is known as the degree to which an individual believes the specific technology will require minimal physical or mental effort (Davis, 1989).

As the application of AI in the tourism industry, PU is assessed based on whether the technology enhances users' travel experience, provides valuable information, and improves service efficiency. For example, robots are used in serving customers during check-in or out of hotels, so that there will be shorter queue during peak hours. PEU is evaluated in terms of the simplicity of interactions with AI systems in the context of tourism, such as simple user interfaces, ease of access, and ease of technology operation. For example, the language translation application provides a simple platform interface and can be easily accessed with a mobile phone. This use of TAM to AI in tourism is consistent with the wider conversation related to TAM and its relevancy to a range of information and communication technologies.

2.2 Review of Literature

The AI applications that have developed more recently, such as chatbot and voice assistants, personalization and recommender systems, language translation application and robots, appear to be the ones that are transforming the tourism industry.

2.2.1 Independent Variable: Chatbots and Voice Assistants (CVA)

Chatbots are software programs that recognize keywords in questions and quickly produce multiple answers to a single question. A major benefit of chatbots has always been their ability to respond quickly (Makar & Tindall, 2014). Furthermore, chatbots are utilized by hotels and other travel-related businesses on social media platforms or instant messaging apps, offering 24/7 accessibility throughout the entire year (Ukpabi et al., 2019). As a result of this feature, chatbots may have successfully taken over jobs that were previously performed by employees.

According to Winkler & Söllner (2018), chatbots possess four main advantages. Firstly, by eliminating the need for human assistants, this technology lowers customer service expenses. Secondly, by offering real-time interactions and availability around the clock, chatbots improve user satisfaction. Thirdly, by predicting client questions, chatbots allow for prompt interaction and the delivery of appropriate details. Fourthly, chatbots record and automatically analyze conversations to better understand customer needs, they enable advanced analysis that improves products and services.

According to Gartner's predictions, by 2020, chatbots will handle 85% of customer requests in businesses (Inbenta Technologies Inc., 2016). Chatbots are

seen by major corporations such as Google, Facebook, and Microsoft as the next big thing in technology (Følstad & Brandtzaeg, 2017). For example, Marriot has effectively used a chatbot for hotel reservations, helping 44% of its registered customers with problems related to their stay and reservations. In a similar vein, Amadeus recently introduced a chatbot to help travel agents with common issues in real-time (De la Rosa, 2019).

In addition, voice assistants improve user experience by providing a convenient and pleasant interaction without overflowing users with too many suggestions at once (Klaus & Zaichkowsky, 2020). These assistants, particularly the voice-based models, are consumer-focused technologies that depend on human interaction to function. Through active participation, users can co-create their own experiences and actively participate in the service delivery process (Neuhofer et al., 2012).

Buhalis and Moldavska (2021) also discussed the analysis of voice assistants' use in the hospitality sector of tourism industry. The primary tasks, which included weather forecasts, hands-free calls, front desk requests, smart room control, Internet browsing, and guest directories, were recognized as the outcomes of interviews that matched primary data sources. On the other hand, interviewees suggested new features and pointed out possible directions for improvement. These areas include effective handling of complaints and feedback, reservations for facilities, and wake-up requests. The topic of voice assistants acting as emergency notification medium was also discussed, emphasizing the potential usefulness of these devices when set up properly. Thus, the results indicated that voice assistants are expected to become widely used in the future. They also propose a future path for voice technology in tourism that prioritizes multilingualism and customized services with the goal of expanding the technology's overall use in the tourism industry.

2.2.2 Independent Variable: Personalization and Recommender Systems (PRS)

Before the widespread use of technology, travelers made decisions about their travel plans, activities, and destinations based mostly on catalog photos. Although the amount of information available has increased thanks to the Internet and User-Generated Content (UGC), price is still the main decision-making factor. However, this dynamic is changing as a result of AI, which makes it possible for businesses to customize experiences for customers and assists travelers in finding options that best fit their preferences. This is achieved through personalization techniques and recommender systems.

Additionally, according to the findings of Ricci et al. (2015), PRS are instruments and tools designed to offer travelers with options that align closely with their preferences. Due to the exponential growth in choices available within online platforms, PRS have increasingly become significance within the tourism industry (Gavalas et al. 2014). PRS typically compare the features of available options against user profiles for delivering an optimal selection.

PRS are predicted to better align with the user's preferences and help to minimize cognitive and information overload for the user. Recommendations are given either explicitly (when the user requests for one) or implicitly (by arranging a list of information items or showing a high rating's recommendation session, for example). These days, PRS are divided into various categories according to the target applications they serve, the knowledge they utilize the methods they use to create recommendations, and the algorithms they implement.

E-tourism PRS are currently in use to collect user preferences and needs before making recommendations for places to visit, things to do, events, activities, or

whole travel packages. Travelers' information search process should be made simpler, and the suitability of the suggested services should be convincing to them. Many PRS for travel have been created in recent years, and some of them are currently available on popular travel portals. For example, TripAdvisor is a travel website that offers recommendations on destinations, activities, and travel itineraries to each user. It has a social component that lets users review, comment on, and rate different elements. This helps with the complicated decision-making process that comes with the tourism industry.

In the domain of service personalization and recommendation, advanced systems like those discussed by Park et al. (2007) take personalized recommendations to a higher level. These sophisticated systems make use of probabilistic models to figure out how contextual data and user-specific information affect the attribute values of tourism services. When recommending restaurants, for instance, factors like the type of cuisine and the price range may be taken into account. Contextual information about the user includes things like the time of day, the location, and the temperature. The recommendation score for a restaurant can be computed as a weighted sum of the conditional probabilities connected to the attribute after gathering this contextual data.

According to Aljukhadar et al. (2012), it is clear that personalization and recommender system technologies have an impact on users' opinions and attract attention, especially when it comes to areas like politics, health, or the workplace. Even though the impact of PRS applications in the travel and tourism industry might not be as great, there is a chance that biased usage could draw unnecessary attention to particular locations or services, going beyond the optimization of user satisfaction on an individual basis.

2.2.3 Independent Variable: Language Translation Applications (LTA)

Bumping into people from different languages is a common part of travel and tourism, and it can present several difficulties for visitors, causing them to feel uneasy and anxious. In addition, language barriers restrict travelers from experiencing local cultures, and leave them with only options to well-known brands when traveling abroad. As to overcome the language barrier issue, the most conventional approach for tourist is to hire a local guide, who can communicate in the local language to bring them around during their trip. However, the rise of LTA offers an alternative.

One of the most popular LTA is, indeed, Google Translate. It can convert unknown languages into ones that you are familiar with. This technological solution, particularly when accessed through smartphones, enables travelers to easily navigate and participate in a variety of activities in a foreign location, decreasing reliance on local guides and promoting integration into the foreign society (Bhati et al., 2019).

Additionally, "Conversation mode," a special feature of Google Translate, allows users to speak with one another in their native tongue. When turned on, this feature records the voice message from the traveler, converts it into the local language, and plays the translated message aloud to help with communication with locals (Dahmash, 2020). Those who are illiterate and unable to type messages will especially benefit from this feature. Google Translate can be used in offline versions if users download languages for offline use. For example, this feature can be used when a local is trying to explain or tell a story in their language to a foreigner. The foreigner may immediately understand the situation as the

application provides an immediate translation and transcript. This improves its accessibility as well as usability.

Furthermore, the “Camera Integration” feature in Google Translate is extremely useful for travelers, especially when interacting with foreign menus and signboards. By utilizing this function, tourists may scan the information on the menus and signboards with their phone’s camera and the information will be directly translated into the user’s preferred language (Bandal et al., 2014; Tatwany & Ouertani, 2017). This feature makes it easier for tourists who have trouble understanding menus and signage in foreign countries. Beyond that, it can translate any text or messages found in photos taken by the camera (Tatwany & Ouertani, 2017). This becomes more useful for travelers who would like to record some information now and have it translated later (Tatwany & Ouertani, 2017).

According to the study of Ogundokun et al. (2021) , the accuracy, translation time, and memory usage of the application were subjected to testing. The language translation application demonstrated a remarkable 99% accuracy in translating from one language to another. The translation time was notably efficient, with the application completing language translations within 47 seconds. For image translation, the time was even more impressive at 1.25 milliseconds, attributed to the use of Java scripts. Thus, LTA provides smooth interactions in real time, enabling visitors to interpret menus, signs, and other relevant data with ease.

With the help of LTA, travelers can interact with the local community and explore local culture more easily. They can now have a more unique experience in foreign places without being anxiety and anxious, such as local restaurants, retail centers, and parks where they can converse with locals in their native tongue (Chavre & Ghotkar, 2016). Fast access to precise translations can improve the overall travel experience, and the application's effective performance fits with the fast pace of

travel. Thus, from a marketing perspective, this technology improves travelers' customer engagement and experience.

2.2.4 Independent Variable: Devices and Integrated Systems (DIS)

Devices and Integrated Systems can be specific as robot, an autonomous device, with sensors and AI that allow it to sense its surroundings, decide what to do, and carry it out. Robots can be designed to be functional, humanoid, animaloid, or to focus on objects (Tung & Law, 2017). The International Federation of Robotics explains robot as a machine that execute tasks normally performed by humans or other equipment necessary for industrial automation. Robotics applications primarily target to enhance operational efficiency and customer interaction in hospitality and tourism settings, including restaurants, hotels, and airport operations (Ivanov et al., 2019a; Tuomi et al., 2019; Borghi & Mariani, 2020; Choi et al., 2020).

Traditionally, robots were primarily utilized within industrial settings. However, as AI has been implemented, robots have become increasingly common in service-oriented environments (Ivanov & Webster, 2019a). This change has enabled service robots to overcome some of the constraints related to human capabilities and address a variety of issues in the tourism industry, such as short of labors and language barriers (Bowen & Morosan, 2018).

Robotics implementation in the tourism and hospitality sectors has several advantages, including increased service quality, lower labor costs, and overall more efficient hotel operations (Ivanov et al., 2019; Zemke et al., 2020). Studies, such as the one conducted by Tung & Au (2018) show that when robots are used to provide hotel services, guests report higher-quality experiences. Robots in the

tourism industry improve customer satisfaction, expedite workflow, free up staff for other tasks, and eventually increase the general productivity of tourism-related enterprises.

In the tourism industry, robotic receptionists have gained popularity, directly affecting the customer's engagement and experience (Bulanov, 2023). They're also accountable for room service aspects, so guests won't run into any issues when they check into a new hotel. An AI-powered robot named "Connie" who works for Hilton Hotels is an excellent case in point. Connie can communicate with visitors and offer information related to tourists. At the Henn-na Hotel in Japan, service robots are employed as in-room companions and at the front desk. In the case of room companions, service robots are designed to react to spoken instructions and adapt to individual customers. Comparably, robots have started to show up in airports, where they serve as assistants and guides (Bowen et al, 2018).

Additionally, using Zaxby's as a case study, Noone & Coulter (2012) investigated the use of robotics to improve the effectiveness of quick-service restaurant operations. The system they examined keeps track of when customers arrive, starts the cooking process upon customer arrival, and gives staff members detailed instructions to speed up cooking and serving, thereby cutting down on wait times. When paired with past sales data, the information gathered from this system allows precise demand forecasting for particular food items.

Virus assassination robots are the newest virus prevention system that has been implemented in a hotel in Texas. The Westin Houston Hotel uses the latest hygiene technology, "LightStrike" and "Germ-Zapping Robots" to combat viruses. These robots use ultraviolet (UV) light to disinfect different areas and get rid of germs, thereby the hotel environment is clean and safe (Rosen, 2020). Two virus-killing

robots are used to keep 273 rooms, the lobby, meeting rooms, bar, cafe, and restaurant clean and hygienic daily. They work by following data instructions and algorithms. The Westin group prioritizes clean rooms and a comfortable environment for guests, so they intend to keep using these robots for cleaning.

2.2.5 Dependent Variable: Transformation of Tourism Industry (TTI)

Intangible experiences and offerings define the tourism industry. (Neuhofer et al., 2015). Nowadays, managers in the tourism sector are integrating a variety of technologies, such as robotics, AI, and self-service kiosks, into their daily operations. These technologies help to deliver smoother customer experiences while boosting the operational efficiencies and replacing labor resources.

Advancements in technology have enabled travelers to easily access a wide range of information about service products, avoiding limitations related to time and location. This change has had a big impact on tourists' shopping habits, allowing them to make better decisions. Technology has also changed the way that destinations utilize Tourism Stakeholder Networks for online promotion and management (Mistilis et al., 2014). A new paradigm in tourism and electronic commerce has been brought about by the rise of eCommerce and online shopping, which are linked to website quality and customer satisfaction (Bai et al., 2008; Law et al., 2010). According to Paraskevas et al. (2011), this evolution highlights the increasing significance of search engine marketing and search engine optimization for improving discoverability and controlling distribution channels.

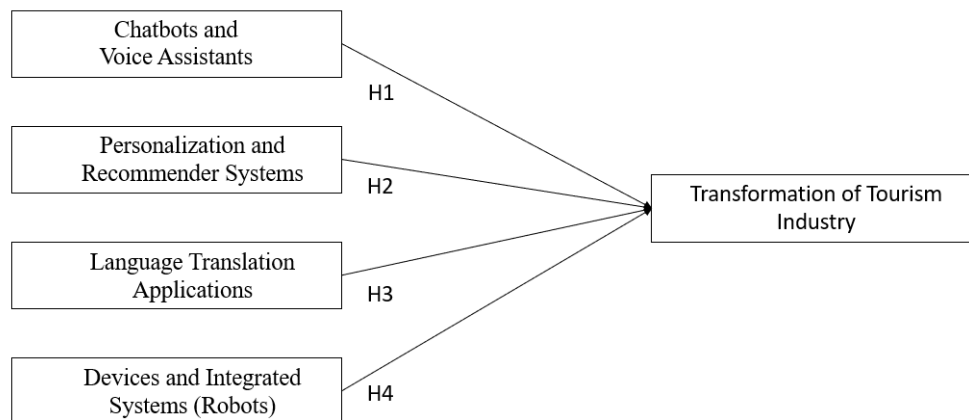
As seen across various service innovation modes, as compared to product innovation, service innovation plays a critical role in the tourism sectors (Gremyr et al., 2014). These innovations result in greater customization and superior

service quality by increasing operational efficiency and providing customers with increased value. Constant innovation helps service companies anticipate their clients' needs, build loyalty with various offerings, reach a wider audience, maximize capacity use, and increase overall effectiveness and productivity. Service innovations facilitate continuous improvement and the simplification of concepts for the benefit of the employees, shareholders, and customers by utilizing technology and processes to generate and deliver increased value to customers. By implementing service innovations in the tourism industry, the power dynamic has changed dramatically as a result of this shift, shifting from businesses to consumers, forcing travel agencies to reconsider how they approach customer engagement (Xiang & Gretzel, 2010).

Customer experiences are changing as a result of innovations like luxurious suites in the aircraft, augmented reality city tours, smart tourism programs, up-to-date distribution channels, and environmentally friendly building facilities. Thus, these developments highlight a significant transformation from a few decades ago in the way the tourism industry functions.

2.3 Conceptual Framework

Figure 2.1: Proposed Conceptual Framework



Source: Developed for the research.

Figure 2.1 indicates the proposed conceptual framework, which aims to investigate the relationship between the four IVs and one DV and have a better understanding of the research hypothesis.

2.4 Hypothesis Development

H1: There is a significant relationship between chatbots and voice assistants and transformation of tourism industry.

H2: There is a significant relationship between personalization and recommender systems and transformation of tourism industry.

H3: There is a significant relationship between language translation applications and transformation of tourism industry.

H4: There is a significant relationship between devices and integrated systems and transformation of tourism industry.

2.5 Conclusion

In this chapter, the definitions of the IVs and DV are discussed in detail under the literature review section. Furthermore, a research framework has been developed to offer a clear visualization of the relationship among the IVs and DV. All of the IVs under the hypotheses development section indicate a significant relationship with the transformation of tourism industry.

CHAPTER 3 : RESEARCH METHODOLOGY

3.0 Introduction

This chapter demonstrates the process of examining data to generate the required information. Both quantitative and descriptive research is adopted in this study for data collection. Moreover, this chapter explains the methodology regarding research design, sampling design, research instruments, data processing and analysis methods.

3.1 Research Design

This chapter outlines the methods and techniques used in this research. The research design serves as a roadmap, showing how the IV and DV are connected to the research questions (Baran, 2022). Additionally, the research design is to guide the research process systematically and aid in decision-making (Jaakkola, 2020).

3.1.1 Descriptive and Causal Research

According to Sekaran & Bougie (2016), there are various research types, such as exploratory, descriptive, and causal research. According to Hunter, McCallum, & Howes (2019), descriptive research aims to describe the attributes of the population or phenomenon being studied. It aims to describe the features of objects, individuals, groups, and environment, answering questions about who, what, when, where, why, and how (Sekaran & Bougie, 2016).

Meanwhile, causal research establishes cause-and-effect relationships between variables (Bhasin, 2021). The study aimed to investigate whether the IVs will

influences the DV after understanding the current state of affairs. As a result, this study incorporates both descriptive and causal research.

3.1.2 Quantitative Research

Quantitative research methods are employed for their capacity to generalize and visually represent data (Carr, 1994). This approach is widely used in previous studies on corporate governance and facilitates statistical analysis by quantifying data (Siswanti et al., 2017). On the other hand, qualitative methods were avoided due to challenges in interpreting complex data with strict criteria (Rahman, 2020).

According to Queiros, Faria, and Almeida (2017), they highlighted the advantages of quantitative results, including access to abundant information across multiple domains and the versatility of statistical tests and techniques. They emphasize the technical process of quantitative research, aiding researchers in assessing relationships between variables and validating hypotheses. Moreover, quantitative research allows the described the strength of relationships between variables through statistical evidence (Sekaran & Bougie, 2016).

As a result, a quantitative research method is employed to examine the hypothesis. Structured questionnaires will be utilized to collect numerical data from respondents (Creswell, 2011).

3.2 Sampling Design

According to Muhammad & Kabir (2016), sampling is a method of choosing a smaller group of people in a broad population as research subjects in an investigation. The correct process of sampling design is as below:

1. Identify the target population.
2. Establish a sampling framework.
3. Determine the sample size.
4. Select appropriate sampling method.
5. Implement the selected method.

3.2.1 Target population

A target population is the individuals who meet all the requirements for the study to proceed (Muhammad & Kabir, 2016). Moreover, the targeted population in this research is focused on individuals who have previous travel experience.

3.2.2 Sampling Frame and Location

A sampling frame is a list that records all elements of the population that the researcher intends to investigate in the study. In this research, the target population is individuals who have previous travel experience. However, tourists' information is highly confidential due to security reasons, and it is complicated to obtain a name list of all the individuals who have previous travel experience. Therefore, there is no sampling frame available to the researcher.

Moreover, the modernization of technology and the growth of the Internet make it is easy to reach out and collect data from individuals who are accessible through online platforms, such as social media platforms or email lists. These online locations are the “virtual” sampling locations for the researcher to interact with respondents and obtain information. Therefore, the researcher has posted the questionnaire on various social media platforms.

3.2.3 Sampling Techniques

Probability sampling and non-probability sampling are the two main sampling techniques. Probability sampling is where a small group of samples is chosen from a large population randomly whereas non-probability sampling selects the group of samples based on subjective judgment rather than random selection. According to Daniel (2012), non-probability sampling can be divided into four additional classifications, namely snowball sampling, convenience sampling, judgmental sampling, and quota sampling.

In this research, the non-probability sampling method is being used throughout. The researchers intend to find participants who have previous travel experience. On top of that, the convenience sampling method is intended to employ for samples collection from those who have previous travel experience, which are ideal demographics for this research. To guarantee the reliability and validity of the response, the target population requirement was imposed before distributing the survey. Additionally, convenience sampling offers rapid results, due to its quick and straightforward approach the research process can be expedited (Bhardwaj, 2019).

3.2.4 Sample Size

Based on the study conducted by Vasileiou et al (2018), it was said that a study may opt for a small, medium, or large sample size depending on their scope. According to Maydeu Olivares, Shi & Rosseel (2018), they suggest that samples sizes between 30 and 500 are generally adequate. Moreover, the sample size of a study should not be either overly small or large samples, as both can impact study conclusions (Faber & Fonseca, 2014).

In this research, Slovin's formula is applied to determine the sample size. It is applied to ensure that the selected samples are unbiased. Let "N" = the population size, "e" = margin of error, and sample size "n" is obtained by the formula:

$$n = \frac{N}{1 + Ne^2}$$

According to The Star (2024), their in-house passenger traffic forecast for the year 2024 would be 105.9 million with points to a full recovery. Thus, a population number of 105.9 million and a 95% level of confidence (0.05 margin of error) is supplied in the formula to calculate the sample size in this research.

$$\begin{aligned} \text{Sample size}(n) &= \frac{N}{1 + Ne^2} \\ &= \frac{105,900,000}{1 + (105,900,000)(0.05)^2} \\ &= 400 \end{aligned}$$

In short, a sample size of 400 is required for this study.

3.3 Data Collection Method

3.3.1 Primary Data Collection

According to Williams & Shepherd (2017), primary data refers to materials or information collected directly by researchers from original sources through techniques like interviews, surveys, and experiments for a specific objective of a study. Primary data can obtain information about the target population more efficiently and accurately (Howard, 2021). Additionally, primary data helps researchers gather information that directly addresses their research questions, get the latest information, and create new and original data.

In this study, questionnaire is used to gather primary data. It is ideal to use as this research intends to find the connection and relationships among the IVs with the DV. Moreover, by collecting primary data, the researcher can clearly understand and reveal the genuine relationship between variables for participants who have experienced AI services during their travel experience.

3.4 Research Instruments

In this study, a Google Form is chosen to conduct the questionnaire and collect information from the respondents. Google Forms can access a large number of respondents at no cost and can reach the intended population in several ways. Various social media platforms and internet tools is used to help reach the desired respondents. Moreover, a pilot study is being conducted to prove the reliability or consistency of the instrument.

3.4.1 Questionnaire Design

According to Acharya (2010), the efficiency of a research process is greatly improved by a carefully constructed questionnaire design. The questionnaire consists of 5 sections with 33 items, and respondents are required to answer all items.

The privacy and disclosure statements of respondents are disclosed in Section 1 of the questionnaire to protect their data. Section 2 is about the demographic information of the respondents, such as their gender, age, education, and income. Section 3 includes information on the respondent's travel behavior, familiarity with the concept of AI, experience with AI related to tourism, and categories that AI relating to tourism that they had heard of or experienced before.

Moreover, Section 4 contains questions related to the IVs and DV, which are CVA, PRS, LTA, DIS, and TTI. In section 4, a five-point Likert scale is employed to ensure the respondents reply numerically from the range of 1 to 5. It is ranked as 1= Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly Disagree. In section 5, a thank you design is used as a conclusion for the questionnaire. Additionally, Appendix 3.2 shows the actual set of the questionnaire.

3.4.2 Pilot Study

According to Hassan et al. (2006), the pilot study is one of the necessary stages in a research study and it can be also known as a useful test.

Pilot testing aims to understand the level of validity and reliability of each questionnaire. Moreover, the pilot test is to obtain feedback for improving the questionnaire, so that it is genuinely to be responded (Ruel et al., 2016).

According to Johanson & Brooks (2010), it is generally recommended to carry out the pilot study with between 30 and 100 respondents. Samples that range from 10 to 300 help in ease of computation, simplicity, and ability to test hypotheses. In this study, 38 respondents is collected to initiate the pilot test phase.

Specifically, after receiving adequate respondents, the reliability for each item is determined by conducting a reliability test. Then, necessary adjustments or amendment are made before the survey is distributed to the target population (Humphries et al., 2015).

Moreover, a Cronbach's Alpha test is used in this research to evaluate the constructs' internal consistency. According to Tavakol & Dennick (2011), Cronbach's Alpha value between 0.60 to 0.70 has a moderate reliability level, where values between 0.70 to 0.80 are good reliability and those value between 0.80 and 0.95 are considered very good reliability.

Table 3.1: Summary of Reliability Test Result in Pilot Test

Variables	Items	Cronbach's Alpha
Chatbots and Voice Assistants	5	0.872
Personalization and Recommender Systems	5	0.885
Language Translation Applications	5	0.764
Devices and Integrated Systems	5	0.875
Transformation of Tourism Industry	5	0.781

Source: Develop from this research.

Table 3.1 shows the Cronbach's Alpha value generated from the SPSS software for the variables are between 0.764 to 0.885. The values are above the recommended cut-off point of 0.7 and are good in reliability. As such, these exceeding values indicate that all items within these variables are reliable and acceptable to be included in this research for further analysis.

3.5 Construct Measurement

3.5.1 Constructs Origin

Table 3.2: Origin of Construct (Questionnaire)

Variables	Item	Sources
------------------	-------------	----------------

Independent	Chatbots and Voice Assistants	Buhalis & Moldavska (2021); González et al. (2019); Markard, Raven & Truffer (2012); Safarzyńska, Future Frenken, & van den Bergh (2012); Smith, Voß, & Grin (2010); Turnheim et al. (2015)
	Personalization and Recommender Systems	Ricci (2020); Pagallo (2016); Sanfeliu et al. (2009); Chessell (2018); Ford (2015); Pham et al. (2018)
	Language Translation Applications	Nakamura (2009); Pagallo (2016); Sanfeliu et al. (2009); Frambach (1993); Frambach & Shillewaert (2002); MacVaugh & Schiavone (2010)
	Devices and Integrated Systems	Ivanov & Webster (2020); Nomura, Kanda, & Suzuki (2006); Pagallo (2016); Sanfeliu et al. (2009)
Dependent	Transformation of Tourism Industry	Tuo, Ning, & Zhu (2021); Grundner & Neuhofer (2021); Amaro, Caldeira & Seabra (2023)

Source: Developed for the research.

3.5.2 Scale Measurement

Table 3.3: Level of Scale Measurement

In this study, 2 types of measurement scales are used as below:

No.	Questions	Level of Scale Measurement
Section A: Personal Information		
1.	Gender	Nominal
2.	Age	Ordinal

3.	Education	Nominal
4.	Income Level	Ordinal
Section B: General Question		
1.	Travel Behavior (local/international)	Ordinal
2.	How familiar are you with the concept of Artificial Intelligence (AI)?	Ordinal
3.	Have you had past experience with Artificial Intelligence (AI) related to tourism?	Nominal
4.	Which Artificial Intelligence (AI) related to tourism have you heard of/experience before?	Nominal
Section C: Measurements		
Chatbots and Voice Assistants		
1.	I frequently use chatbots and voice assistants to get real-time assistance and information during my travel experience.	Ordinal
2.	I agree that chatbots and voice assistants provide an accurate and reliable information during my travel experience.	Ordinal
3.	I agree that integration of chatbots and voice assistants enhances the overall satisfaction on my travel experience.	Ordinal
4.	I agree that integration of chatbots and voice assistants will enhance the efficiency of service during my travel experience.	Ordinal
5.	I agree that utilizing chatbots and voice assistants can achieve sustainable on tourist experience.	Ordinal
Personalization and Recommender Systems		
1.	I believe in the implementation of personalization and recommender systems in tourism industry.	Ordinal

2.	I believe that personalization and recommender systems will influence my decision-making process when I'm choosing my travel destinations and activities.	Ordinal
3.	I believe that personalization and recommender systems will increase my satisfaction and loyalty towards the tourism industry.	Ordinal
4.	I believe in the suggestion provided by the personalization and recommender systems.	Ordinal
5.	I believe that personalization and recommender systems impact on tourism industry labor market and skills requirements.	Ordinal
Language Translation Applications		
1.	I frequently use language translation applications to overcome language barriers during my travel experiences.	Ordinal
2.	I agree that using language translation applications can help to offer tourists a more welcoming and convenient experience.	Ordinal
3.	I agree that there are no barriers of adopting the language translation applications	Ordinal
4.	I believe in the information provided by the language translation applications.	Ordinal
5.	I agree that integration of language translation applications enhances the tourist's overall cultural immersion and understanding of local customs.	Ordinal
Devices and Integrated Systems		
1.	I observed that devices and integrated systems is widely used in tourism industry.	Ordinal
2.	I agree that it is easy to interact with the devices and integrated systems.	Ordinal

3.	I agree that the devices and integrated systems will influence tourists' perceptions of a destination's technological advancement and innovation.	Ordinal
4.	I agree that integration of devices and integrated systems will enhance the efficiency of service during my travel experience.	Ordinal
5.	I believe in the performance and service provided by the devices and integrated systems.	Ordinal
Transformation of Tourism Industry		
1.	I realized that AI is transforming the tourism industry.	Ordinal
2.	I agree that integration of AI systems will enhance my overall tourist experience.	Ordinal
3.	I agree that adaptation and acceptance of AI systems will have potential to revolutionize operational efficiency in the tourism industry.	Ordinal
4.	I agree that advancement in AI systems have positively impact on tourism industry.	Ordinal
5.	I am satisfied with the transformation in tourism industry.	Ordinal

Source: Developed for the research.

3.5.2.1 Nominal Scale

According to Dalati & Gomez (2018), a nominal scale is normally used in surveys to identify an object from large demographic subgroups. In our research, nominal metrics can be seen in question, which is with category, but without order.

Example: Have you had past experience with Artificial Intelligence (AI) related to tourism?

Yes

No

3.5.2.2 Ordinal Scale

According to Mishra et al. (2018) ordinal scale is assessed based on value positions without precise numerical differences or fixed units of measurements, while it determines greater or lower relations.

Example: I realized that AI is transforming the tourism industry.

(1) Strongly Disagree

(2) Disagree

(3) Neutral

(4) Agree

(5) Strongly Agree

3.6 Data Analysis Techniques

Data Analysis is the process of processing the collected data, examining, manipulating, and visualizing each item of the analysis to carry out a meaningful conclusion in a research study.

In this study, the researcher utilizes a variety of data analysis techniques to determine the significance of each variable within the model and help the reader have a clearer understanding. IBM SPSS Statistics is used to conduct and analyze the data once finished collecting the questionnaire data. This analysis included descriptive analysis, internal reliability analysis, and inferential analysis.

3.6.1 Descriptive Analysis

Descriptive analysis is widely used to summarise a study without the need to conduct probability theory to draw any conclusions. According to research conducted by Kemp, Ng, Hollowood & Hort (2018), descriptive analysis is a tools of data analysis that helps in providing explanations, simple quantitative metrics (percentages or averages), graphic explanations (histograms or bar charts), and summaries of data point in a valuable way.

A reasonable level of data simplification can be achieved by using descriptive analysis. It helps researchers to easily identify errors or irregularities and enables them to identify the relationship between variables.

3.6.2 Internal Reliability Analysis

Cronbach's Alpha is conducted to indicate the internal reliability and validity of the data collected so that the results are accurate. (Mohajan, 2017). According to the research conducted by Cronbach (1951), Cronback's Alpha value generally ranges from 0 to 1, with 0 proving that there is no significant relationship between the items and 1 proving that there is absolute consistency. Based on Table 3.4, the Cronbach's Alpha value is identified.

Table 3.4 : Cronbach’s Alpha Rule of Thumb

Cronbach’s Alpha	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Source: Cronbach (1951)

3.6.3 Inferential Analysis

Inferential analysis is a technique of data analysis that is widely used to determine the correlation between IV and DV or how strong the DV is in proximity to the IVs. In this study, Multiple Regression Analysis and Pearson Correlation Coefficient are used to determine the degree of correlation between the variables.

3.6.3.1 Pearson Correlation Coefficient

The Pearson Correlation Coefficient is one of the techniques to measure the relationship between variables to see if they are positively or negatively linked, or if there is no connection between them (Borges et al., 2020). The variables are considered interrelated if one variable changes based on the another variable. Moreover, it can prove the strength of this relationship between variables. Based on Table 3.5, it shows the correlation coefficient range and correlation strength.

Table 3.5 : Pearson Correlation Coefficient Value

Correlation Coefficient Range	Correlation
±0.00 to ± 0.09	Negligible
±0.10 to ±0.39	Weak
±0.40 to ±0.69	Moderate
±0.70 to ±0.89	Strong
±0.90 to ±1.00	Very Strong

Source: Cheong et al., 2021

3.6.3.2 Multiple Regression Analysis

Multiple Regression Analysis is a statistical technique that is mostly used in research studies to examine quantitative data. It uses a straight line to assess the relationship between two or more IVs and the DV. Moreover, this technique can determine how at most the IV interact with DV.

As such, in this research, multiple regression analysis is used to determine the relative influence of the four IVs (CVA, PRS, LTA, and DIS) on the single DV (TTI).

The formula equation for multiple regression analysis is as below:

$$y = \beta_1x_1 + \beta_2x_2 + \dots + \beta_nx_n + \mu$$

Equation:

$$TTI = \beta_1CVA + \beta_2PRS + \beta_3LTA + \beta_4DIS + \mu$$

Whereby,

CVA= Chatbots and Voice Assistants

PRS= Personalization and Recommender Systems

LTA= Language Translation Applications

DIS= Device and Integrated Systems

TTI= Transformation of Tourism Industry

μ = Error / Residual Term

3.7 Conclusion

This chapter clarifies the research method used, such as research design, sampling design, data collection method, and data analysis techniques. It elaborates on the first steps of conducting the research study, starting with selecting the target population, to the last step, proposing data analysis techniques. In the next chapter, the collected data is presented and analyzed, including additional interpretation to justify the research hypothesis.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

In this chapter, data obtained from this study will be discussed. It is the most crucial part of the study as it presents the Descriptive Analysis, Reliability Analysis, and Inferential Analysis. The data cleaning process is analyzed by IBM SPSS Statistics software in order to guarantee accuracy and consistency in the data from 402 respondents in this study. The data analyzed will be presented in visually illustrated charts, figures, and tables to enhance its comprehensibility.

4.1 Data Collection Process and Respond Rates

Google Form, an online self-administered questionnaire was designed to collect data from individuals who have previous travel experience. The survey was distributed through multiple social media platforms, such as Whatsapp, Instagram, Microsoft Teams, XiaoHongShu, X, Facebook, and Telegram. A total of 402 surveys were completed.

4.2 Descriptive Analysis

This section mainly illustrates the demographic background of the respondents.

4.2.1 Respondent's Demographic Profile

This analysis includes the respondents' gender, age, education, income level, travel behavior, familiarity with the concept of AI, experience with AI related to tourism, and AI related to tourism that they heard of or experienced before. Graphical items such as pie charts and distribution tables are used to interpret and visualize the demographic profile of the respondents.

4.2.1.1 Gender

Figure 4.1: Gender

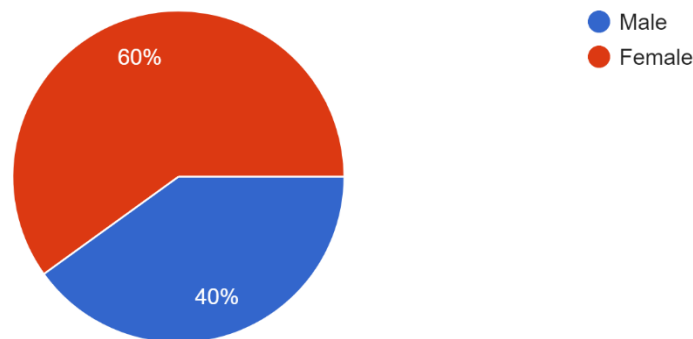


Table 4.1: Gender

Gender	Frequency	Percentage(%)
Male	161	40
Female	241	60

Sources: Developed for the research

Based on Figure 4.1 and Table 4.1, there are 161 (40%) of the respondents in this survey are male, while 241 (60%) of them are female. According to Condor

Ferries, there are more female travelers worldwide in comparison with male travelers. (Goldstein, 2024)

4.2.1.2 Age

Figure 4.2: Age

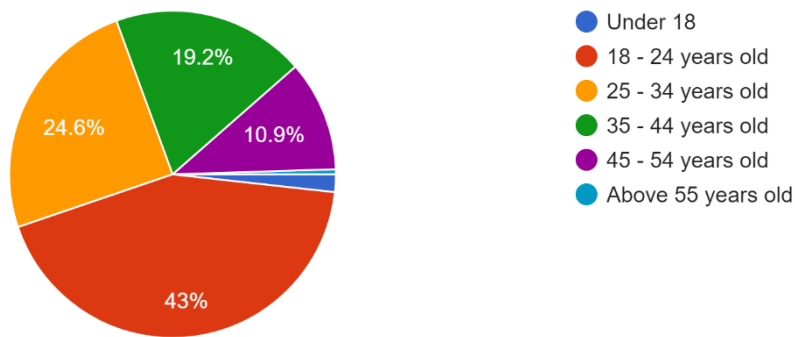


Table 4.2: Age

Age	Frequency	Percentage (%)
Under 18 years old	7	1.7
18 -24 years old	173	43
25-34 years old	99	24.6
35-44 years old	77	19.2
45-54 years old	44	10.9
Above 55 years old	2	0.5

Sources: Developed for the research

Based on Figure 4.2 and Table 4.2, it represents that 7 (1.7%) of respondents are those who are less than 18 years old. Besides, the higher results among the age group are the respondents who aged between 18 to 24 years old, with a result of

173 (43%) respondents. The age group of 25 to 34 years old, 35 to 44 years old, and 45 to 54 years old has a frequency of 99 (24.6%), 77 (19.2%), and 44 (10.9%) respectively. However, the ages of above 55 years old are the lower results among the age group with only a frequency of 2 (0.5%).

4.2.1.3 Education

Figure 4.3: Education

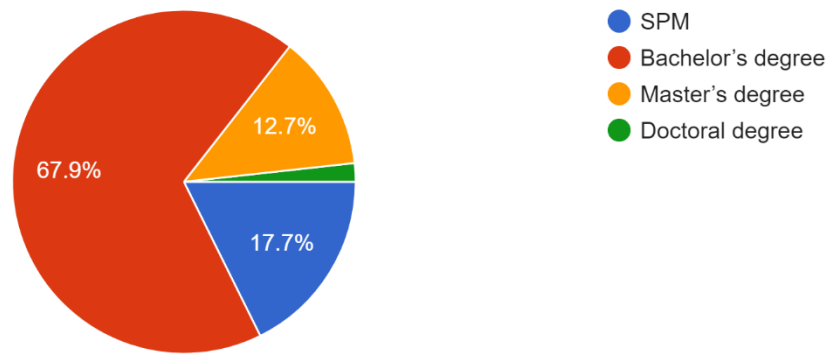


Table 4.3: Education

Education	Frequency	Percentage (%)
SPM	71	17.7
Bachelor's degree	273	67.9
Master's degree	51	12.7
Doctoral degree	7	1.7

Sources: Developed for the research

Based on Figure 4.3 and Table 4.3, 71 (17.7%) of respondents indicated they are individuals with SPM certificates, and 273 (67.9%) had their bachelor's degree. Moreover, 51 (12.7%) respondents accounted that they hold a master's degree, while only 7 (1.7%) of them hold a doctoral degree.

4.2.1.4 Income Level

Figure 4.4: Income Level

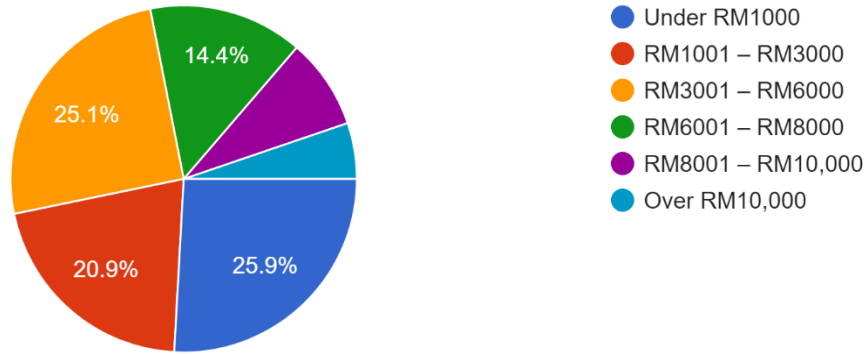


Table 4.4: Income Level

Income Level	Frequency	Percentage (%)
Under RM1000	104	25.9
RM1001-RM3000	84	20.9
RM3001-RM6000	101	25.1
RM6001-RM8000	58	14.4
RM8001-RM10,000	34	8.5
Over RM10,000	21	5.2

Sources: Developed for the research

Based on Figure 4.2 and Table 4.2, it demonstrates that 104 (25.9%) of the respondents' income fell below the RM1000 category. Nearly 20.9% of the respondents (84 respondents) reported they have more than RM1001 to RM3000 income, while other income level categories, which are RM3000 to RM6000, RM6001 to RM8000, and RM8001 to RM10,000, and above RM10,000 accounted for 25.1% (101 respondents), 14.4% (58 respondents), 8.5% (34 respondents), and 5.2% (21 respondents) respectively.

4.2.1.5 Travel Behavior (local/international)

Figure 4.5: Travel Behavior

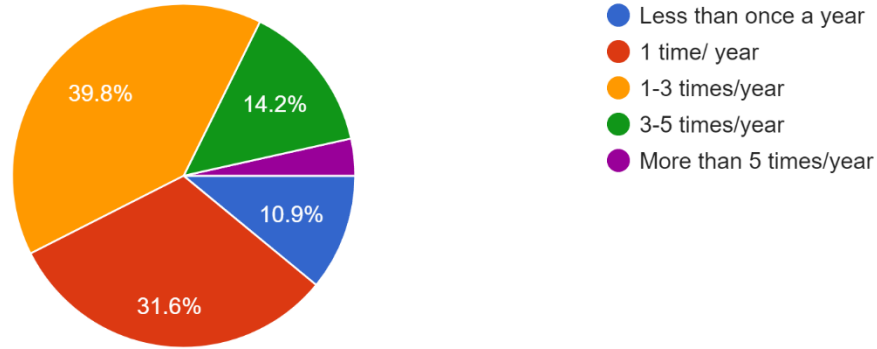


Table 4.5: Travel Behavior

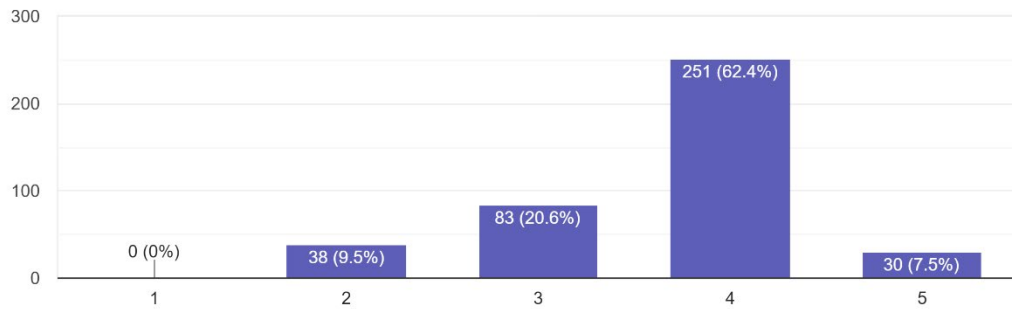
Travel Behavior	Frequency	Percentage (%)
Less than once a year	44	10.9
1 time/ year	127	31.6
1-3 times/year	160	39.8
3-5 times/year	57	14.2
More than 5 times/year	14	3.5

Sources: Developed for the research

Based on Figure 4.5 and Table 4.5, 160 (39.8%) respondents have a travel behavior of 1 to 3 times per year, while 127 (31.6%) of the respondents travel only 1 time per year. Moreover, there are 57 (14.2%) individuals who travel 3 to 5 times per year and 44 (10.9%) individuals who travel less than once a year. In comparison, there are only 14 (3.5%) respondents who travel more than 5 times per year.

4.2.1.6 How familiar are you with the concept of Artificial Intelligence (AI)?

Figure 4.6: Familiarity with the concept of AI



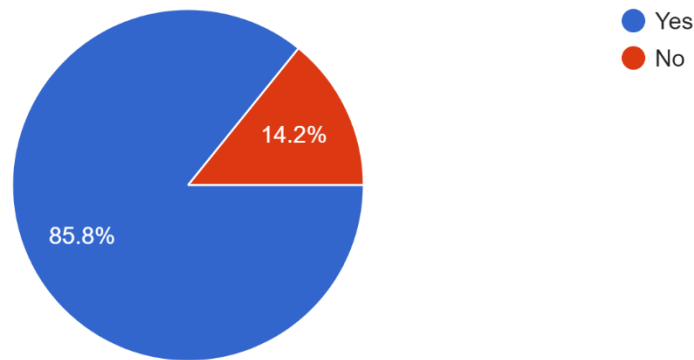
Sources: Developed for the research

In this question, 1 indicates that respondents are not familiar at all with the concept of AI, while 5 indicates that respondents are very familiar with the concept of AI.

Based on Figure 4.6, nearly 62.4% of the respondents are familiar with the concept of AI, followed by 20.6% of the respondents having a moderate level of familiarity and 9.5% of the respondents having a low level of familiarity. However, there are 7.5% of respondents are very familiar with the concept of AI.

4.2.1.7 Have you had past experience with Artificial Intelligence (AI) related to tourism?

Figure 4.7 : Experience with AI related to tourism

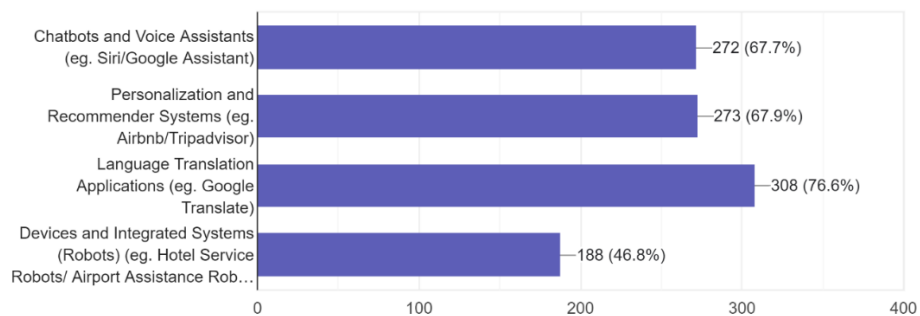


Sources: Developed for the research

Based on Figure 4.7, 85.8% (345 respondents) of the respondents had experience with AI related to tourism, while only 14.2% (57 respondents) of them do not had experience with AI related to tourism.

4.2.1.8 Which Artificial Intelligence (AI) related to tourism have you heard of/experience before?

Figure 4.8 : AI related to tourism that respondents heard of/experience before



Sources: Developed for the research

Based on Figure 4.8, shows that Language Translation Applications are the most AI-related system to tourism that is being heard of or experienced by the respondents, which is supported by 308 (76.6%) respondents. Besides, Chatbots and Voice Assistants and Personalization and Recommender Systems have nearly the same familiarity, which have 272 (67.7%) and 273 (67.9) respondents respectively. However, Devices and Integrated Systems have the least familiarity to the respondents as there are only 188 of them who heard of or experienced it before.

4.2.2 Central Tendencies of Measurement

The mean and standard deviation of each item, including each IVs and DV, will be described in this section to seek accurate description of all the study data. Mean represents the average score given by respondents for each statement, while standard deviation is the measurement of the spread or dispersion of the scores around the mean. The lower the standard deviation, the more the scores are clustered closely around the mean, indicating less variability in responses.

4.2.2.1 Mean and Standard Deviation of Chatbots and Voice Assistants (IV)

Table 4.6 Mean and Standard Deviation (CVA)

Item	Statement	Mean	Standard Deviation
CVA1	I frequently use chatbots and voice assistants to get real-time assistance and information during my travel experience.	3.65	0.873
CVA2	I agree that chatbots and voice assistants provide an accurate and	3.49	0.803

	reliable information during my travel experience.		
CVA3	I agree that integration of chatbots and voice assistants enhances the overall satisfaction on my travel experience.	3.69	0.782
CVA4	I agree that integration of chatbots and voice assistants will enhance the efficiency of service during my travel experience.	3.68	0.866
CVA5	I agree that utilizing chatbots and voice assistants can achieve sustainable on tourist experience.	3.64	0.851

Sources: Developed for the research

According to Table 4.6, CVA3 shows the highest mean value, which is 3.69, followed by CVA4 (3.68), CVA1 (3.65), and CVA5 (3.64). However, CVA2 has the lowest mean value (3.49).

Moreover, CVA1 shows the highest standard deviation value (0.873), while CVA3 shows the lowest standard deviation value (0.782). Moreover, the standard deviation values for CVA 4, CVA5, and CVA2 are 0.866, 0.851, and 0.803 respectively.

4.2.2.2 Mean and Standard Deviation of Personalization and Recommender Systems (IV)

Table 4.7 Mean and Standard Deviation (PRS)

Item	Statement	Mean	Standard Deviation
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PRS1	I believe in the implementation of personalization and recommender systems in tourism industry.	3.80	0.855
PRS2	I believe that personalization and recommender systems will influence my decision-making process when I'm choosing my travel destinations and activities.	3.65	0.878
PRS3	I believe that personalization and recommender systems will increase my satisfaction and loyalty towards the tourism industry.	3.78	0.839
PRS4	I believe in the suggestion provided by the personalization and recommender systems.	3.71	0.815
PRS5	I believe that personalization and recommender systems impact on tourism industry labor market and skills requirements.	3.75	0.879

Sources: Developed for the research

According to Table 4.7, PRS1 shows the highest mean value, which is 3.80, followed by PRS3 (3.78), PRS5 (3.75), and PRS4 (3.71). However, PRS2 has the lowest mean value (3.65).

Moreover, PRS5 shows the highest standard deviation value (0.879), while PRS4 shows the lowest standard deviation value (0.815). Moreover, the standard deviation values for PRS2, PRS1, and PRS3 are 0.878, 0.855, and 0.839 respectively.

4.2.2.3 Mean and Standard Deviation of Language Translation Applications (IV)

Table 4.8 Mean and Standard Deviation (LTA)

Item	Statement	Mean	Standard Deviation
LTA1	I frequently use language translation applications to overcome language barriers during my travel experiences.	3.81	0.790
LTA2	I agree that using language translation applications can help to offer tourists a more welcoming and convenient experience.	3.58	0.853
LTA3	I agree that there are no barriers of adopting the language translation applications	3.68	0.856
LTA4	I believe in the information provided by the language translation applications.	3.68	0.837
LTA5	I agree that integration of language translation applications enhances the tourist's overall cultural immersion and understanding of local customs.	3.72	0.883

Sources: Developed for the research

According to Table 4.8, LTA1 shows the highest mean value, which is 3.81, followed by LTA5, with only 3.72 mean value. LTA3 and LTA4 have the same mean value, 3.68. However, LTA2 has the lowest mean value (3.58).

Moreover, LTA5 shows the highest standard deviation value (0.883), while LTA1 shows the lowest standard deviation value (0.790). Moreover, the standard deviation values for PRS3, PRS2, and PRS4 are 0.856, 0.853, and 0.837 respectively.

4.2.2.4 Mean and Standard Deviation of Device and Integrated Systems (IV)

Table 4.9 Mean and Standard Deviation (DIS)

Item	Statement	Mean	Standard Deviation
DIS1	I observed that devices and integrated systems is widely used in tourism industry.	3.78	0.808
DIS2	I agree that it is easy to interact with the devices and integrated systems.	3.61	0.844
DIS3	I agree that the devices and integrated systems will influence tourists' perceptions of a destination's technological advancement and innovation.	3.72	0.839
DIS4	I agree that integration of devices and integrated systems will enhance the efficiency of service during my travel experience.	3.63	0.840
DIS5	I believe in the performance and service provided by the devices and integrated systems.	3.61	0.907

Sources: Developed for the research

According to Table 4.9, DIS1 shows the highest mean value, which is 3.78, followed by DIS3 and DIS4, with mean values of 3.72 and 3.63 respectively. However, DIS2 and DIS5 have the same mean value of 3.61, which is the lowest among the DIS group.

Moreover, DIS5 shows the highest standard deviation value (0.907), while DIS1 shows the lowest standard deviation value (0.808). Moreover, the standard deviation values for DIS2, DIS4, and DIS3 are 0.844, 0.840, and 0.839 respectively.

4.2.2.5 Mean and Standard Deviation of Transformation of Tourism Industry (DV)

Table 4.10 Mean and Standard Deviation (TTI)

Item	Statement	Mean	Standard Deviation
TTI1	I realized that AI is transforming the tourism industry.	3.94	0.748
TTI2	I agree that integration of AI systems will enhance my overall tourist experience.	3.71	0.815
TTI3	I agree that adaptation and acceptance of AI systems will have potential to revolutionize operational efficiency in the tourism industry.	3.80	0.771
TTI4	I agree that advancement in AI systems have positively impact on tourism industry.	3.79	0.796

TTI5	I am satisfied with the transformation in tourism industry.	3.66	0.876
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Sources: Developed for the research

According to Table 4.5, TT1 records the highest value of mean (3.94) and lowest value of standard deviation (0.748) among the other items in this group, followed by TT3 with a mean of 3.80 and standard deviation of 0.771, TT4 with the mean of 3.79 and standard deviation of 0.79, and TT2 with the mean of 3.71 and standard deviation of 0.815. However, TT5 shows the lowest value of mean (3.66) and highest value of standard deviation (0.876).

4.3 Reliability Test

Table 4.11: Summary of Reliability Test in Full Study

Variables	Items	Cronbach's Alpha
Chatbots and Voice Assistants	5	0.785
Personalization and Recommender Systems	5	0.824
Language Translation Applications	5	0.792
Devices and Integrated Systems	5	0.819
Transformation of Tourism Industry	5	0.804

Source: Develop from this research.

As mentioned in Table 3.4, Cronbach's Alpha that is above 0.7 is acceptable and reliable. Based on Table 4.10, the summary of the reliability test of this study shows that Cronbach's Alpha for all five variables ranges from 0.785 to 0.824, which proves that all variables in this study are good in reliability and consistency to proceed for further analysis.

4.4 Inferential Analysis

In this section, the researcher will be conducting Pearson Correlation Coefficient and Multiple Regression Analysis to distinguish between variables that are independent of one another and those that are related. Moreover, it is used to examine the relationship between the DV and the IVs.

4.4.1 Pearson Correlation Coefficient

Table 4.12: Pearson Correlation Coefficient

		Chatbots and Voice Assistants	Personalization and Recommender Systems	Language Translation Applications	Devices and Integrated Systems
Transformation of Tourism Industry	Pearson Correlation	.432**	.575**	.588**	.649**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001
	N	402	402	402	402

Source: Develop from this research.

Based on Table 4.11, all of the IVs are having P value below 0.01, which proves that they all are having significant relationship with the DV. Besides, all of the IVs are moderately positively correlated with the DV as their Pearson Correlation value are between 0.40 to 0.69.

4.4.2 Multiple Regression Analysis

4.4.2.1 Model Summary

Table 4.13: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.729 ^a	.531	.526	.41337

a. . Independent Variable: (Constant), DIS, CVA, LTA, PRS

Source: Develop from this research.

Based on Table 4.12, it reveals that the value of R is 0.729, which is strong and positive. Moreover, the R square value is acceptable at the value of 0.1 to 0.50, whereas the value above 0.5 is considered strong. (Ozili, 2022). The R square value for this study is 0.531, indicating that the DV is strongly influenced by the IVs at the degree of 53.1%.

4.4.2.2 ANOVA

Table 4.14: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	76.867	4	19.217	112.462	<.001 ^b
	Residual	67.837	397	.171		
	Total	144.704	401			

a. Dependent Variable: TTI

b. Independent Variable: DIS, CVA, LTA, PRS

Source: Develop from this research.

Based on Table 4.13, the ANOVA test presented that the study has a significance level <0.001. Thus, it indicates that all of the IVs are trustworthy and can be reliable to explain the DV. The regression model effectively predicts the outcome of variables with statistical validity.

4.4.2.3 Coefficients

Table 4.15: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.656	.157		4.189	<.001
	CVA	.109	.039	.111	2.813	.005
	PRS	.168	.043	.183	3.946	<.001
	LTA	.232	.044	.241	5.335	<.001
	DIS	.339	.042	.364	8.012	<.001

a. Dependent Variable: TTI

Source: Develop from this research.

According to Table 4.14, CVA, PRS, LTA, and DIS are all significant in influencing TTI as their p values are all smaller than the alpha value (0.05). Additionally, DIS shows the best standard coefficient (0.364), indicating that DIS can explain TTI. It is followed by LTA (0.241), PRS (0.183), and CVA (0.111).

Additionally, the multiple regression formula for this study can be formulated as below:

$$TTI = \beta_1 CVA + \beta_2 PRS + \beta_3 LTA + \beta_4 DIS + \mu$$

$$TTI = 0.109CVA + 0.168PRS + 0.232LTA + 0.339DIS + 0.656$$

$\mu = 0.656$ which means when CVA, PRS, LTA, and DIS are equal to zero, TTI is 0.656.

$\beta_1 = 0.109$ which means when CVA increase by 1%, TTI will increase by 0.109%.

$\beta_2 = 0.168$ which means when PRS increase by 1%, TTI will increase by 0.168%.

$\beta_3 = 0.232$ which means when LTA increase by 1%, TTI will increase by 0.232%.

$\beta_4 = 0.339$ which means when DIS increase by 1%, TTI will increase by 0.339%.

This suggests that DIS will make the highest contribution to TTI as its beta value is the highest among the group of IVs, whereas CVA will make the lowest contribution to TTI when all the other explanatory factors are controlled.

4.5 Hypothesis Testing

4.5.1 Chatbots and Voice Assistants

H0: There is a negative relationship between chatbots and voice assistants and transformation of tourism industry.

H1: There is a positive significant relationship between chatbots and voice assistants and transformation of tourism industry.

Reject H0, if the p-value is < 0.05 . Based on Table 4.14, shows that there is an influential value of CVA, where its p-value is recorded as 0.005. Thus, H0 is rejected, and H1 is supported. This indicates that CVA have a major impact on the TTI.

4.5.2 Personalization and Recommender Systems

H0: There is a negative relationship between personalization and recommender systems and transformation of tourism industry.

H2: There is a positive significant relationship between personalization and recommender systems and transformation of tourism industry.

Based on Table 4.14, it shows that there is an influential value of PRS, where its p-value is recorded as <0.001 . Thus, H_0 is rejected, and H_2 is supported. This demonstrates that PRS have a major impact on the TTI.

4.5.3 Language Translation Applications

H_0 : There is a negative relationship between language translation applications and transformation of tourism industry.

H_3 : There is a positive significant relationship between language translation applications and transformation of tourism industry.

Table 4.14 presents that there is an influential value of LTA, where its p-value is recorded as <0.001 . Thus, H_0 is rejected, and H_3 is supported. This proved that LTA have a major impact on the TTI.

4.5.4 Devices and Integrated Systems

H_0 : There is a positive significant relationship between devices and integrated systems and transformation of tourism industry.

H_4 : There is a positive significant relationship between devices and integrated systems and transformation of tourism industry.

Table 4.14 presents that there is an influential value of DIS, where its p-value is recorded as <0.001 . Thus, H_0 is rejected, and H_4 is supported. This indicates that DIS have a major impact on the TTI.

4.6 Conclusion

In short, 402 responses were included in the data analysis process by using descriptive analysis, reliability analysis, and inferential analysis. Demographic information of the respondents is shown in pie charts and tables. Moreover, the results proved that there is a positive relationship between each IVs and DV, as all values of the Pearson Correlation Analysis and Multiple Regression Analysis are within acceptable ranges. Additional discussion and analysis are continued in the following chapter.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

Chapter 5 dive into the analysis of the results presented in Chapter 4. Its objectives include evaluating the research questions and objectives, assessing the study's limitations, proposing suggestion for future research, and formulating conclusions.

5.1 Discussion of Major Finding

Table 5.1: Hypothesis Table

Hypothesis Testing	Pearson Correlation Coefficient	Result	Supported/ Not Supported
H1: There is a positive significant relationship between chatbots and voice assistants and transformation of tourism industry.	.432**	$\beta = 0.111$ P= 0.005	Supported
H2: There is a positive significant relationship between personalization and recommender systems and transformation of tourism industry.	.575**	$\beta = 0.183$ P= <0.001	Supported
H3: There is a positive significant relationship between language translation applications and transformation of tourism industry.	.588**	$\beta = 0.241$ P= <0.001	Supported

H4: There is a positive significant relationship between Devices and integrated systems and transformation of tourism industry.	.649**	$\beta = 0.364$ P= <0.001	Supported
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Source: Developed for the study

5.1.1 Relationship between Chatbots and Voice Assistants and Transformation of Tourism Industry

Based on Table 5.1, H1 is supported, indicating that chatbots and voice assistants have a positive impact on the transformation of tourism industry. Chatbots and voice assistants provide 24/7 accessibility for travel businesses both physically and virtually, with the potential to replace human tasks, such as customer service, as emphasized by Makar & Tindall (2014) and Ukpadi et al. (2019). Besides, in consistency with the findings of Winkler & Söllner (2018), chatbots and voice assistant is widely used in transforming the tourism industry as they reduce customer service representatives, where overhead costs are reduced, enhance satisfaction by providing quicker responses than humans, and enable advanced analysis of customer interactions. Additionally, according to Calvaresi et al. (2021), providing the feature of real-time customer interactions, chatbots and voice assistants could help one to plan a customized travel plan or experience as a mobile concierge anytime and anywhere. Therefore, based on the findings mentioned above, chatbots and voice assistants have a significant effect on the transformation of tourism industry.

5.1.2 Relationship between Personalization and Recommender Systems and Transformation of Tourism Industry

Based on Table 5.1, H2 is supported, indicating that personalization and recommender systems have a positive significant relationship with the transformation of tourism industry. This finding aligns with Ricci et al. (2015)

and Gavalas et al. (2014) research, which explains that personalization and recommender systems can provide travelers with the best option of recommendation or suggestion align with the user's preference after comparing the attributes of available options with user profiles and it is being increasingly important in the tourism industry. Moreover, it minimizes cognitive thinking and information overload for users. Furthermore, it proves that the discussion of Park et al (2007) about the effectiveness of personalization and recommender systems is reliable as participants agree that it improves customer satisfaction and loyalty. Thus, based on the findings mentioned above, the personalization and recommender systems have a significant effect on the transformation of tourism industry.

5.1.3 Relationship between Language Translation Applications and Transformation of Tourism Industry

Based on Table 5.1, H3 is supported, indicating that language translation applications have a positive significant relationship with the transformation of tourism industry. As emphasized in the research of Bhati et al. (2019), language translation applications facilitate smoother communication between tourists and locals, overcoming language barriers while fostering cultural exchange and understanding. Besides, the ability and accessibility of the language-translation applications enable travelers to explore destinations independently, which enriches the tourist's travel experience by providing more freedom and flexibility in their itineraries. By doing so, the tourism industry has been transformed as it eliminates the need for tour guides or translators in the future. Moreover, Chavre & Ghotkar (2016) stated that it is easier for tourists to understand the local language and foster cultural exchange with the language translation applications because users can interact with the society and explore local cuisine more easily and flexibly. Therefore, based on the findings mentioned above, the language translation applications have a significant effect on the transformation of tourism industry.

5.1.4 Relationship between Devices and Integrated Systems and Transformation of Tourism Industry

Based on Table 5.1, H4 is supported, indicating that the devices and integrated systems have a positive significant relationship with the transformation of tourism industry. This finding aligns with Bowen & Morosan (2018) and Li et al. (2019) research, which explains that constraints of human capabilities, such as language barriers and labor shortages, can be streamlined or enhanced with the help of the devices and integrated systems. With the help of devices and integrated systems, tourism-related enterprises get to expedite workflow, increase general productivity, and improve customer satisfaction in different situations (Tung & Au,2018). Furthermore, devices and integrated systems can serve as physical assistants and guides in specific locations, which helps to reduce some human jobs and improve the effectiveness of the operation process. Thus, based on the findings mentioned above, the devices and integrated systems have a significant effect on the transformation of tourism industry.

5.2 Implications of the Study

At the beginning of this research, the researcher adopted the Technology Acceptance Model (TAM) as a supporting theory. Moreover, the TAM is modified accordingly to ensure that it fits the context of this research. Overall, in this study, both theoretical and practical implications are discussed. The theoretical implication involves the process of demonstrating how research findings align with existing theories or concepts within the field, while the practical implications are translating the theoretical insights into actionable recommendations for industry practitioners.

5.2.1 Theoretical Implications

This study adopted the Technology Acceptance Model (TAM) to provide a solid theoretical basis for investigating the transformation of tourism industry. Past studies indicated that perceived usefulness (PU) and perceived ease of use (PEU) were found to be the primary determinants in participants' decisions or intention to adopt technology. This study confirmed that PU of AI systems, such as chatbots and voice assistants, personalized and recommender systems, language translation applications, and device and integrated systems, plays an important role in their adoption within the tourism industry. Tourists are more likely to accept AI systems if they perceive them as benefiting their travel experience, providing reliable information, and improving service efficiency.

Furthermore, this study shows that tourists are more likely to implement AI systems in tourism if they find them easy to use and understand. AI systems with simple designs that fit smoothly are important so that users using them are satisfied and have a good experience. Thus, if AI systems initiate to continue transforming tourism industry, PU and PEU of the AI systems should be prioritized and enhanced by focusing on its features and functionalities that directly benefit tourist and meet their needs.

5.2.2 Practical Implications

The findings of this study convey several key practical implications for the transformation of tourism industry. The outcome of this study indicates that the relationship between all IVs and DV is positively related. This showed that the AI system has a great impact on the transformation of tourism industry. However, tourists will prioritize the application with seamless integration of AI systems in tourism industry, including user-friendly interfaces of web pages or applications, innovative or attractive designs, and multilingual support to enhance the overall

user experience and satisfaction. Ease of technology operation and interaction are essential to promote widespread adoption and positive user experiences.

Tourists may implement the AI system to ease their travel experience, such as utilizing PRS to tailor travel recommendations to get customized itinerary suggestions, restaurant suggestions, and accommodation options that align with their interests and preferences. After planning the itinerary, tourists can utilize CVA to enhance information access as CVA can answer to FAQs and provide local insights. During travel, tourists can utilize LTA to reduce language barriers as LTA can offer translation services, where tourists can engage with locals more effectively and navigate unfamiliar environments more confidently. Thus, AI systems are empowering tourist decision-making and making travel experiences easier with their vast amounts of data, such as user reviews, ratings, and travel trends.

5.3 Limitations of the Study

In this section, the limitation of the study is identified and discussed. It is important for limitations to be identified as it can influence the reliability and validity of the research findings. There are two main limitations of this study to be discussed and considered.

5.3.1 Imbalanced Demographic Information of Respondents

When the questionnaire is distributed online, it is challenging to control the demographic of respondents as there is a diverse range of participants online, making it difficult to have a balanced representation in different demographic categories.

It is important to have balanced demographic information so that it does not create a disproportionate group in the sample and introduce bias into the results. The findings in this survey may be limited to young adults because most of the respondents are in the age group of 18 to 24 years old, which is 43%, whereas the findings may not apply to older age groups.

Moreover, imbalanced demographic information of respondents may affect researchers to confidently attribute differences in outcomes and external validity of findings to the variables being studied if they are limited by demographic factors. Thus, the reliability and validity of the study's conclusion can be less accurate.

5.3.2 Language Barrier for Data Collection

Another limitation that has been identified is the language barrier encountered during data collection. This arises because the questionnaire is only available in one language, English. When the questionnaire is distributed online, there are respondents from different countries with diverse languages. If the respondent is unfamiliar with English, it is challenging for them to understand and complete the form, as the questionnaire is confusing and subject to misinterpretation.

Furthermore, if someone does not understand English, they are unable to fill out the questionnaire, which could result in missing out on valuable insights from certain demographics. It shall be not practical to include all languages, but at least there are language choices for respondents to choose before they start doing the questionnaire, so that respondents may complete the survey faster and reduce the time-consuming. Thus, it is important to prepare questionnaires in different

languages to avoid undermining of generalizability of the research findings and ensure the accuracy and reliability of data collected across language barriers.

5.4 Recommendation for Future Research

In this section, recommendations are provided to make further improvements and enhance future studies. This section may help other researchers in improving their research process, aid researchers in publishing more insightful analyses, and make better inferences that can potentially benefit the well-being and quality of life of commoners.

5.4.1 Implement Strata Sampling Technique

It is suggested that all age groups should be included in the study as they are also part of our target population. By amending the current convenience sampling method to the strata sampling technique, it may address the limitation of imbalanced demographic information of respondents. In this study, strata sampling could be implemented by dividing the population into distinct strata based on the demographic variables that are important for the study. For example, the researcher could create strata for different age groups, such as 18 to 24 years old, 25 to 34 years old, and 35 to 44 years old. Then, within each stratum, randomly select participants to participate in the study. This ensures that each demographic subgroup is represented in the sample proportionally to its presence in the population. Data is collected and analyzed within each stratum to ensure adequate representation of all demographic groups in the sample, while still maintaining randomness in participant selection. This can lead to more precise estimates and more reliable conclusions compared to simple random sampling or quota sampling.

5.4.2 Implement Multilingual Questionnaires with Language Options

To address the limitation of a language barrier for data collection, it is suggested that the researchers should implement multilingual questionnaires with language options. However, it may not be practicable to include every possible language, thus a selection of commonly spoken languages can significantly enhance accessibility for respondents from diverse linguistic backgrounds. For example, English, Bahasa Malaysia, and Chinese can be offered to Malaysia's population. Before starting the questionnaire, respondents should be given the option to choose their preferred language. This approach can streamline the data collection process, improve respondent engagement, and reduce the likelihood of missing out on valuable insights from specific demographic groups. Besides, by doing so, there can also be broader participation, enhance the generalizability of research findings, and improve the accuracy and reliability of data collected across language barriers.

5.5 Conclusion

In conclusion, this study thoroughly explored that the four IVs are having positive impacts on the transformation of tourism industry. Specifically, the transformation of tourism industry was shown to be most influenced by the device and integrated systems. Moreover, this study offers both theoretical and practical implications for related industry professionals to develop fruitful strategies for improving the current tourism industry with AI systems. However, despite there are some limitations, the study's research objectives were achieved, as the positive significant relationship between each IV with the transformation of tourism industry was presented clearly. Additionally, recommendations are highlighted for future researchers who are interested in investigating similar relevant issues.

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APPENDICES

Appendix 3.1: Ethical Approval For Research Project/Protocol



UNIVERSITI TUNKU ABDUL RAHMAN DU012(A)
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Re: U/SERC/78-212/2024

13 January 2024

Dr Fitriya Binti Abdul Rahim
Head, Department of International Business
Faculty of Accountancy and Management
Universiti Tunku Abdul Rahman
Jalan Sungai Long
Bandar Sungai Long
43000 Kajang, Selangor

Dear Dr Fitriya,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your students' research project from Bachelor of International Business (Honours) programme enrolled in course UKMZ3016. We are pleased to inform you that the application has been approved under Expedited Review.

The details of the research projects are as follows:

No.	Research Title	Student's Name	Supervisor's Name	Approval Validity
1.	The Motivation for Purchasing Souvenirs Among the Domestic Tourists	Wan Shiuan Ling	Ms Annie Yong Ing Ing	13 January 2024 – 12 January 2025
2.	Factor Affecting Healthy Food Purchase Behaviours of Generation Z	Pe Kai Wen		
3.	Factors Affecting Customer Satisfaction Among Online Shoppers	Dion Teh Jee Wei		
4.	The Factors Influences on Customer Satisfaction and Loyalty in Business Performance	Tang Wei Ping		
5.	The Impact of Social Media Influencer on Youth Online Buying Behaviour in Klang Valley	Goh Pieh Ling	Ms Chin Wai Yin	
6.	A Study on E-commerce Factors that Influence Post-purchase Behaviour of Young Adults in Malaysia	Chan Chiew Kong	Dr Corinne Lee Mei Jyin	
7.	Factors and Barriers to Attaining Mental Health Services	Chan Pei Xin		
8.	Factors Influencing the Customer Intention in Adopting Autonomous Vehicles (AVs)	Chye Chi Ern		
9.	Applying the Fraud Triangle Theory to Examine Fraudulent Cases from the Perspective of Working Adults	Alex Lau Chin Yeh	Dr Eaw Hooi Cheng	
10.	Examining the Influential Factors of Financial Fraud on Social Media from the Perspective of University Students	Bryan Wee Xin Jie		
11.	Factors Affecting Financial Fraud Awareness Among University Students	Liew Yoon Ler		
12.	The Impact of ChatGPT on E-commerce: The Case of Platform-based Business	Lee Siu Ying	Pn Ezatul Emilia Binti Muhammad Arif	

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No.	Research Title	Student's Name	Supervisor's Name	Approval Validity
13.	Adoption Rate of Digital Channel among MSMEs Entrepreneurs. (A Comparison Between Social Commerce and E-Commerce Platforms)	Law Yung Khan	Pn Ezatul Emilia Binti Muhammad Arif	13 January 2024 – 12 January 2025
14.	Factor Affecting Consumers Behavioral Intention to Share Digital Footprints on Social Media	Jenny Leong Siew Yee	Pn Farida Bhanu Binti Mohamed Yousoof	
15.	Factors Affecting the Unemployment Crisis Among Fresh Graduate in Malaysia	Lim Say Siang		
16.	The Buying Behaviour on Green Products - From A Consumer Perspective	Lim Xiao Xuan	Dr Foo Meow Yee	
17.	Factor Affecting Consumer Brand Loyalty on Personal Care Product	Ooi Xin Yi		
18.	Drivers of Employee Retention: A Case Study in Health and Beauty Industry	Tan Chi Ying		
19.	Factors of Remote Work Influencing Remote Work Productivity of Employees in Malaysia	Lee YanZheng	Ms Hooi Pik Hua @ Rae Hooi	
20.	Exploring University Students' Readiness for the Industrial Revolution 4.0: A Conceptualised Framework	Poh Joe Yee	Dr Jayamalathi a/p Jayabalan	
21.	The Role of Artificial Intelligence on the Overall Success of SMEs in the E-Commerce Sector	Low Wai Ying	Ms K Shamini a/p T Kandasamy	
22.	Understanding the Impact of Short Video Advertising on Youth Consumer Behavior	Celine Tia Hui Lin	En Khairul Anuar Bin Rusli	
23.	Influence of Corporate Social Responsibility (CSR) on Consumer Purchase Intention	Yeo Ai Ping		
24.	The Impact of Green Marketing of Food and Beverages on Consumers' Purchase Intention	Yong Xin En		
25.	Factors that Influence the Acceptance of QR Payment Among Customers in Malaysia	Lee Hai Wen	Dr Komathi a/p Munusamy	
26.	To Study the Influences of Compensation, Work Environment, Motivation on Employee Satisfaction Among Industrial Trainees	Sam Li Ixing		
27.	The Influence of Celebrity Endorsements on Consumers' Purchase Intention Toward Sports Equipment	Chong Wei Ni		
28.	Investigating the factors of online payment technology in influencing consumer purchase behavior	Chua Jun Quan		
29.	The Impact of Utilizing ChatGPT in Higher Education	Lee Zi Wei	Dr Law Kian Aun	
30.	The Effectiveness of Duolingo's AI-Powered Language Learning Platform in Improving Second Language Acquisition Among Malaysia's Tertiary Students	Oh Fang Yan		
31.	The Effects of AI Tools on Undergraduates' Academic Writing Proficiency	Ng Shi Zhe		
32.	Consumer's Coping Strategies Toward Packaging Waste in Food Delivery Service	Tan Shin Rhu	Mr Lee Yoon Heng	
33.	Securing User Trust: A Study on Social Media Privacy, Information Protection, User Education, and Platform Reliability	Lim Jing	Ms Logeswary a/p Maheswaran	
34.	User Acceptance of Neobanks in Malaysia	Tang Sze Jun	Ms Loh Yin Xia	
35.	The Interplay of Digital Financial Literacy, Capability, Autonomy in the Financial Decision-making in Today's Digital Age	Wong Zheng Wah	Dr Low Mei Peng	
36.	Effects of In-store Factors Influencing Consumer Impulse Buying Behavior in Shopping Mall	Soh Xin Jie	Dr Malathi Nair a/p G Narayana Nair	
37.	Examining the Impact of Generation Z's Attitude Towards Counterfeit Footwear in Malaysia	Lim Su Kim		
38.	Young Adults' Intention to Use Mobile Payment in Malaysia	Alvin Chow Mun Sing		
39.	Consumer Motivation to Repurchase Organic Personal Care Products	Crystal Chow Weng Yann		

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No.	Research Title	Student's Name	Supervisor's Name	Approval Validity
40.	The Impact of Worklife Balance on Employee Performance in Private Universities in Malaysia	Yeo Jing Wen	Dr Omar Hamdan Mohammad Alkharabsheh	13 January 2024 – 12 January 2025
41.	Determinants of Student's Satisfaction on AI Usage in Education	Chang Charng Jie	Ms Puvaneswari a/p Velloo	
42.	How Artificial Intelligence (AI) is Transforming Tourism Industry	Boon Yi Jean	Pn Raja Nurul Aini Binti Raja Aziz	
43.	Factors Affecting the Consumption Pattern of Fast Fashion Products Among Generation Z	Evelyn Chow Sum Yee	Dr Sia Bee Chuan	
44.	Antecedents and Consequences of Beauty and Cosmetic Products Impulse Purchase on TikTok	Kong Chi Kei	Dr Tang Kin Leong	
45.	Examining the Antecedents of Perceived Enjoyment and Flow Experience in Impulsive Buying Behaviour: A Study from the Perspective of TikTok User	Tan Hong Qing		
46.	Understanding the Determinants of Online Hotel Booking Intentions	Sharon Lian Sin Yee	Dr Tiong Kui Ming	
47.	A Study of Eco-Conscious Consumer Behavior on Green Products	Tan Sze Ting		
48.	Brand Loyalty Among Generation Z Towards Samsung Products in Malaysia	Chey Xin Hui	Dr Yeong Wai Mun	
49.	Factors Influencing the Adoption of Touch 'n Go eWallet Among Consumers in Malaysia	Lim Si Ting		

The conduct of this research is subject to the following:

- (1) The participants' informed consent be obtained prior to the commencement of the research;
- (2) Confidentiality of participants' personal data must be maintained; and
- (3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.
- (4) Written consent be obtained from the institution(s)/company(ies) in which the physical or/and online survey will be carried out, prior to the commencement of the research.

Should the students collect personal data of participants in their studies, please have the participants sign the attached Personal Data Protection Statement for records.

Thank you.

Yours sincerely,



Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Accountancy and Management
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Appendix 3.2: Questionnaire



**UNIVERSITI TUNKU ABDUL RAHMAN
FACULTY OF ACCOUNTANCY AND MANAGEMENT**

**BACHELOR OF INTERNATIONAL BUSINESS
FINAL YEAR PROJECT**

How Artificial Intelligence (AI) Is Transforming Tourism Industry

Survey Questionnaire

The purpose of this survey is to investigate “How Artificial Intelligence (AI) is Transforming Tourism Industry”. Your involvement will make a big difference in the survey's success.

We sincerely appreciate for taking your time to complete this survey; your answers will be kept confidential and used **only for academic purposes**.

Supervisor's Name : Puan Raja Nurul Aini Binti Raja Aziz

Student Name : Boon Yi Jean

Student ID : 2102400

Instructions:

Dear Participants,

Greetings! I am Boon Yi Jean, student from Universiti Tunku Abdul Rahman (UTAR), pursuing a degree in Bachelor of International Business (HONS). I'm currently conducting a research on “**How Artificial Intelligence (AI) Is Transforming Tourism Industry**” for my final year project. This research aims to study how AI is transforming tourism industry.

This questionnaire consists of **THREE (3)** sections that should take approximately 5 – 10 minutes to complete. Your involvement will make a big difference in the survey's success. We sincerely appreciate for taking your time to complete this survey. Your answers will be kept **PRIVATE & CONFIDENTIAL** and used only for academic purposes.

For any further inquiries, please contact boonyiJean@utar.my.

Thank you for your participation!

PERSONAL DATA PROTECTION NOTICE

Please be informed that in accordance with Personal Data Protection Act 2010 (“PDPA”) which came into force on 15 November 2013, Universiti Tunku Abdul Rahman (“UTAR”) is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

1. Personal data refers to any information which may directly or indirectly identify a person which could include sensitive personal data and expression of opinion. Among others it includes:
 - a) Name
 - b) Identity card
 - c) Place of Birth
 - d) Address
 - e) Education History
 - f) Employment History
 - g) Medical History
 - h) Blood type
 - i) Race
 - j) Religion
 - k) Photo
 - l) Personal Information and Associated Research Data

2. The purposes for which your personal data may be used are inclusive but not limited to:
 - a) For assessment of any application to UTAR
 - b) For processing any benefits and services
 - c) For communication purposes
 - d) For advertorial and news
 - e) For general administration and record purposes
 - f) For enhancing the value of education
 - g) For educational and related purposes consequential to UTAR
 - h) For replying any responds to complaints and enquiries
 - i) For the purpose of our corporate governance
 - j) For the purposes of conducting research/ collaboration

3. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

4. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.
5. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

6. By submitting or providing your personal data to UTAR, you had consented and agreed for your personal data to be used in accordance to the terms and conditions in the Notice and our relevant policy.
7. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.
8. You may access and update your personal data by writing to us at boonyiJean@lutar.my

Acknowledgment of Notice

I have been notified and that I hereby understood, consented and agreed per UTAR above notice.

I disagree, my personal data will not be processed.

Name :.....

Date :.....

Section A: Personal Information

Instruction: Please select the appropriate option for each of the question given below.

1. Gender
 - Male
 - Female

2. Age
 - Under 18
 - 18 - 24 years old
 - 25 - 34 years old
 - 35 - 44 years old
 - 45 - 54 years old
 - Above 55 years old

3. Education
 - SPM
 - Bachelor's degree
 - Master's degree
 - Doctoral degree

4. Income level
 - Under RM1000
 - RM1001 – RM3000
 - RM3001 – RM5000
 - RM5001 – RM8000
 - RM8001 – RM10,000
 - Over RM10,000

Section B: General Question

1. Travel behavior (local/international)
 - Less than once a year
 - 1 time/year
 - 1-3 times/year
 - 3-5 times/year
 - More than 5 times/year

2. How familiar are you with the concept of Artificial Intelligence (AI)

1	5
Not familiar at all	Very familiar

3. Have you had past experience with AI related to tourism?
 - Yes
 - No

4. Which Artificial Intelligence (AI) related to tourism have you heard of/experience before?
 - Chatbots and Voice Assistants (eg. Siri/Google Assistant)
 - Personalization and Recommender Systems (eg. Airbnb/Tripadvisor)
 - Language Translation Applications (eg. Google Translate)
 - Devices and Integrated Systems (Robots) (eg. Hotel Service Robots/ Airport Assistance Robots)

Section C: Measurements

Instruction: Please select the appropriate option for each question to indicate whether you agreed or disagreed with the following statements.

1 = Strongly Disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A) and 5 = Strongly Agree (SA)

Chatbots and Voice Assistants

No.	Questions	SD	D	N	A	SA
1.	I frequently use chatbots and voice assistants to get real-time assistance and information during my travel experience.	1	2	3	4	5
2.	I agree that chatbots and voice assistants provide an accurate and reliable information during my travel experience.	1	2	3	4	5
3.	I agree that integration of chatbots and voice assistants enhances the overall satisfaction on my travel experience.	1	2	3	4	5
4.	I agree that integration of chatbots and voice assistants will enhance the efficiency of service during my travel experience.	1	2	3	4	5
5.	I agree that utilizing chatbots and voice assistants can achieve sustainable on tourist experience.	1	2	3	4	5

Personalization and Recommender Systems

No.	Questions	SD	D	N	A	SA
1.	I believe in the implementation of personalization and recommender systems in tourism industry.	1	2	3	4	5
2.	I believe that personalization and recommender systems will influence my decision-making process when I'm choosing my travel destinations and activities.	1	2	3	4	5
3.	I believe that personalization and recommender systems will increase my satisfaction and loyalty towards the tourism industry.	1	2	3	4	5
4.	I believe in the suggestion provided by the personalization and recommender systems.	1	2	3	4	5
5.	I believe that personalization and recommender systems impact on tourism industry labor market and skills requirements.	1	2	3	4	5

Language Translation Applications

No.	Questions	SD	D	N	A	SA
1.	I frequently use language translation applications to overcome language barriers during my travel experiences.	1	2	3	4	5
2.	I agree that using language translation applications can help to offer tourists a more welcoming and convenient experience.	1	2	3	4	5

3.	I agree that there are no barriers of adopting the language translation applications	1	2	3	4	5
4.	I believe in the information provided by the language translation applications.	1	2	3	4	5
5.	I agree that integration of language translation applications enhances the tourist's overall cultural immersion and understanding of local customs.	1	2	3	4	5

Devices and Integrated Systems (Robots)

No.	Questions	SD	D	N	A	SA
1.	I observed that devices and integrated systems is widely used in tourism industry.	1	2	3	4	5
2.	I agree that it is easy to interact with the devices and integrated systems.	1	2	3	4	5
3.	I agree that the devices and integrated systems will influence tourists' perceptions of a destination's technological advancement and innovation.	1	2	3	4	5
4.	I agree that integration of devices and integrated systems will enhance the efficiency of service during my travel experience.	1	2	3	4	5
5.	I believe in the performance and service provided by the devices and integrated systems.	1	2	3	4	5

Transformation of Tourism Industry

No.	Questions	SD	D	N	A	SA
1.	I realized that AI is transforming the tourism industry.	1	2	3	4	5
2.	I agree that integration of AI systems will enhance my overall tourist experience.	1	2	3	4	5
3.	I agree that adaptation and acceptance of AI systems will have potential to revolutionize operational efficiency in the tourism industry.	1	2	3	4	5
4.	I agree that advancement in AI systems have positively impact on tourism industry.	1	2	3	4	5
5.	I am satisfied with the transformation in tourism industry.	1	2	3	4	5

Appendix 4.1: Pilot Test Results (SPSS)

Table 4A.1: CVA's Pilot Test's Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.785	5

Table 4A.2: PRS's Pilot Test's Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.824	5

Table 4A.3: LTA's Pilot Test's Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.792	5

Table 4A.4: DIS's Pilot Test's Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.819	5

Table 4A.5: TTI's Pilot Test's Cronbach's Alpha

Reliability Statistics	
Cronbach's Alpha	N of Items
.804	5

Appendix 4.2: Pearson Correlation Coefficient Results (SPSS)

Table 4A.6: Pearson Correlation Coefficient

		Correlations				
		CVA	PRS	LTA	DIS	TTI
CVA	Pearson Correlation	1	.431**	.332**	.445**	.432**
	Sig. (2-tailed)		<.001	<.001	<.001	<.001
	N	402	402	402	402	402
PRS	Pearson Correlation	.431**	1	.587**	.555**	.575**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001
	N	402	402	402	402	402
LTA	Pearson Correlation	.332**	.587**	1	.556**	.588**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001
	N	402	402	402	402	402
DIS	Pearson Correlation	.445**	.555**	.556**	1	.649**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001
	N	402	402	402	402	402
TTI	Pearson Correlation	.432**	.575**	.588**	.649**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	
	N	402	402	402	402	402

** . Correlation is significant at the 0.01 level (2-tailed).