

# TOURISM INNOVATION

— *in the* —

# DIGITAL ERA

*Big Data, AI and Technological  
Transformation*

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*Edited by*

MARCO VALERI

NEW PERSPECTIVES IN TOURISM  
AND HOSPITALITY MANAGEMENT

# **Tourism Innovation in the Digital Era**

# New Perspectives in Tourism and Hospitality Management

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# Tourism Innovation in the Digital Era: Big Data, AI and Technological Transformation

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INVESTOR IN PEOPLE

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# Preface

Digitalization and service automation are already visible in the tourism industry, raising questions on their wider impact on the industry and the holiday-experience. Moreover, digitalization and artificial intelligence (AI) are increasingly influencing modes of travel planning, exploration of new destinations, promotion of them and also the experience of travelling through novel regions. New technologies are changing, and will continue to change, the face of tourism in the years ahead. Numerous challenges are created, to which countries, destinations and especially business entities need to find a response, or a strong wave of digitalization will erase them from the market. At the same time, opportunities are being created that should be exploited. Numerous application examples and cases of those technologies across the entire holiday value chain and their diffusion drivers are evident. According to the World Economic Forum's (2017) latest report: 'The greatest societal impact may be the effect of digital transformation on the travel workforce, which could represent as many as one in every 11 jobs worldwide by 2025. Intelligent automation will change the nature of some travel jobs and eradicate others altogether'.

Cognitive abilities and systems-related skills are becoming increasingly vital, within a social-skill-focused tourism education and training. Generations of tourists born after 1980, and especially those who will be coming to the fore in the next 10 years, will have radically different expectations and requirements in relation to today's tourists. The sharing economy and the experience economy strongly influence the creation of new business models in tourism. The integration of mobile technologies into hotel business processes, the ability to inspect business and adapt to new conditions in real time and digital interaction with guests will be crucial for achieving competitiveness and survival in the increasingly demanding international market. Digitalization and AI are essential to support the improvement and rationalization of business processes and infrastructures and to enhance the competitive advantage. Many low-income economies can potentially benefit from this digital transformation and others are at risk of being left behind if they fail to embrace this moment.

This book *Tourism Innovation in the Digital Era. Big Data, AI and Technological Transformation* aims to provide a comprehensive collection of chapters encouraging discussion on the organizational impacts of digitalization and AI in tourism and hospitality. Digital technologies and platforms are disrupting the way the hospitality sector operates from end-to-end. E-platforms offer global access to consumers and allow service providers to enhance the development of the hospitality industry and its

competitive standards. Particularly, this book deals with research into new economic phenomena and the response of the hospitality industry as well as other touristic companies to the increasingly demanding needs of modern generations of consumers in tourism. Digital technologies have demonstrated the potential to give the hospitality industry direct access to a global market and this industry is vital to the growth of most developing economies, with the potential to promote entrepreneurship and innovation.

## Structure of the Book

This book *Tourism Innovation in the Digital Era. Big Data, AI and Technological Transformation* is the result of reflections involving research studies of different nationalities. This book contains 9 chapters written by 22 authors located in 10 different countries and affiliated with 18 different universities.

The first chapter titled ‘The Important of Big Data Analysis: Developing Neuromarketing in Tourism Industry’ is written by Norhidayah Azman, Ahmad Albattat and Marco Valeri. The aim of this chapter is to investigate big data analysis, the value of big data analysis and how the use of big data may improve the tourism industry by allowing the creation of neuromarketing approaches to increase marketing strategies for tourism companies. The process of finding trends, patterns and correlations in enormous amounts of unstructured data in order to assist in making choices that are influenced by the data is referred to as ‘big data analytics’. These processes use conventional methods of statistical analysis, such as clustering and regression, and apply them to more extensive datasets with the assistance of contemporary technologies. The phrase ‘big data’ has been a popular buzzword ever since the early years of the new millennium, when advances in computer software and hardware made it possible for businesses to handle enormous amounts of unstructured data. Even while the tourism industry has a plethora of useful big data, the fact that it exists does not always imply that it can be used effectively. On the other hand, the term ‘neuromarketing’ refers to the measurement of physiological and brain signals in order to gain insight into the motives, preferences and decisions of consumers. This information can then be used to inform creative advertising, the development of new products, pricing and other aspects of marketing. There is a relationship between big data and neuromarketing due to the fact that stakeholders in the tourism industry need to be acquainted with and comprehend the vast amounts of data that are available in the company. In addition, participants in the tourist industry need to have an understanding of how to make use of big data by using the appropriate technologies that provide them the ability to derive relevant insights from the data.

The second chapter titled ‘The Contribution of Artificial Intelligence in the Chinese Tourism Industry’ is written by Panoraia Poulaki, Antonios Kritikos and Nikolaos Vasilakis. The aim of this chapter is to focus that the AI plays a particularly important role in the field of hosting due to the advent of new digital technologies. This research intends through the collection of secondary data from

the international literature to focus on the contribution of digital transformation and AI practices in the development of the hospitality sector in China. It gathers qualitative and quantitative data of AI practices that highlight the growth trend of this particular ‘smart form of tourism’ that uses special processing capabilities and algorithms while helping the hotel industry in its optimization in the fields of operations and marketing. The implications of digital technologies in the field of hospitality include very important trends that are increasingly attracting attention during the evolution of hospitality. It has provided the possibility of experiencing a virtual reality for the visitors of a tourism destination through the smart machines of the hotel units and the tourism destination that provide them with better experiences due to their innovative and technological methods. At the end of this research, proposals are given that highlight the strengths and opportunities of the utilization of AI systems in the field of hospitality from a modern research point of view. The challenges, weaknesses and threats that may arise from digital transformation and AI systems are also studied. Modern research proves their acceptance by visitors on trips with the corresponding impact on the financial part of their trip, on the part of their experiences and the positive or negative appearance of results of specific systems in the field of employment during its development before and after AI in the field of hospitality during the transition to the digital world of the twenty-first century.

The third chapter titled ‘An Overview of Research on Tourism 4.0 and Smart Tourism: A Visualization Analysis’ is written by Mert Ogretmenoglu, Busra Kesici and Gulsah Kocakaya. This chapter aims to review tourism 4.0 and smart tourism literature using a bibliometric approach. The authors used a VOS viewer to graph and map bibliographic documents. This chapter is original in that it deals with the concepts of smart tourism and tourism 4.0 together. Results showed that the literature on tourism 4.0 and smart tourism is growing remarkably. This chapter can provide significant knowledge for scholars investigating smart tourism and tourism 4.0 concepts.

The fourth chapter titled ‘Crises and Resilience in the Age of Digitalization: Perspectives of Past, Present and Future for Tourism Industry’ is written by Manpreet Arora, Jeetesh Kumar and Marco Valeri. The aim of this chapter is to explore theoretically, what role digitalization has played in reviving the sector after pandemic through systematically reviewing the papers from SCOPUS database. An exhaustive systematic literature review has helped to conceptually work out the existing work done on crises and digitalization with special emphasis on tourism industry. It aims at exploring the contributions in existing literature on ‘crises and digitalization’ to work out the importance of digitalization in crises as resilience strategy that can help to deal with uplifting the tourism industry after pandemic. A critical discussion on varied aspects of crises and digitalization has broadened the ambit of critical exploration vis-à-vis resilience strategies. This piece of work is novel and original highlighting the importance of digitalization in tourism industry especially after crises. As a resilience strategy digitalization of the businesses in tourism industry helps to provide visibility by small efforts which can be cost effective also. This is helpful to those especially who lack support in the value chain of the sector and want some push for restarting their activities.

The recent trend in the tourism industry is tourism for well-being or nature-based tourism where the tourists want to explore the rural, countryside places in the lap of nature where they can find their spiritual dimensions of their own existence. Global and regional innovations in the travel ecosystems are possible only through digital interventions.

The fifth chapter titled ‘Corporate Social Responsibility as a Competitiveness Factor in Hotels in Latin America’ is written by Laura Guillermina Duarte Caceres and Antonio Emmanuel Perez Brito. The aim of this chapter is to analyze the current state of knowledge of corporate social responsibility as a factor that affects the competitiveness of hotels through a systematic review of the international academic literature with an emphasis on Latin America. The research work consists of a systematic review that involves the analysis of documents, articles, dissertations and international academic works that presented both theoretical and empirical research results. The search was conducted from January to December 2020 in online databases and search engines. The hotels have national and international economic relevance. Still, studies in this field are scarce. In this way, a compilation of recent works is made, to identify the way that corporate social responsibility affects the competitiveness of these enterprises that currently face serious problems in this domain, aggravated by pandemic, as well as generate a contribution to the state of the art and the subject knowledge gaps. The environmental awareness and knowledge that exists about this concept, there has not been a comprehensive way to apply it. Therefore, it is necessary to introduce certain measures, like sharing information and training on these issues. Also, it shows how there are significant differences in the application of CSR by categories and dimensions of sustainability.

The sixth chapter titled ‘The Role of Digital Transformation on Women Empowerment for Rural Areas: The Case of Turkey’ is written by Melike Sak, Alhamzah Alnoor, Marco Valeri and Gül Erkol Bayram. The aim of this chapter is to examine the projects and studies carried out in the tourism sector for the empowerment of women in rural areas in Turkey. With this study, the opportunities that women in the tourism sector can provide to their working lives with the development of digitalization and technology will be examined. The current situation, problems and future expectations of women empowerment in Turkey are discussed according to the document analysis technique, one of the qualitative research methods. Related literature and relevant statistics and current data were reviewed. The study is consisted of three main titles. The first title is women empowerment and their roles and responsibilities on tourism industry, the second title is rural tourism and potential of women population in Turkey challenges and opportunities and the third title is role of digital transformation on women empowerments within the case of Turkey. Since the issue of relations digitality and women empowerments in Turkey has not been discussed before, it can be said that the study is meaningful and original. According to the results, it is seen that women in Turkey have some opportunities and challenges by digital evolutions. By the sustainable solutions, digitality can help women and problems have been partially resolved with various government incentives and supports.

The seventh chapter ‘Staycation Makers’ Motivation and Their Preference for Robot/AI-Assisted Products and Services: Some Observations From Hanoi, Vietnam’ is written by Hằng Thị Bích Trần, Bình Nghiệm-Phú and Nhung Thị Hồng Dương. The aim of this chapter is to examine staycationers’ motivation and their preferences for robot/AI-assisted products and services at staycation destinations in Vietnam. This chapter chose Hanoi, the capital city in the North of Vietnam, as its setting. This chapter adopted a qualitative design with personal interviews as the data collection method. Nineteen participants were interviewed, and the data were analyzed via an inductive process. The findings suggest that staycation makers were a type of tourist whose motivation consists of escaping (relaxation and stress reduction) and seeking (experiences, entertainment, exploration, atmospheric changes and family and friend connections) aspects. These motivational points reflected the core need for a holiday with satisfactory products and services, such as lodging, eating, drinking and playing. However, destination owners could consider adding peripheral products and services provided by robots and AIs, such as information provision and room assistance. These additions could further meet the staycation makers’ escaping and seeking motivations. The findings of this study expand the understanding of staycation. They also provide implications for developing and promoting staycation products and services.

The eighth chapter is titled ‘The Development and Management of Slow Tourism Through the “Intangible Cultural Heritage”’ is written by Alexandros Filiopoulos and Panoraia Poulaki. The aim of this chapter is to focus on the conditions and ways in which the cultural product and especially the one related to the intangible and living cultural heritage can be highlighted and interactively work in the development of alternative forms of tourism, such as slow tourism. A multidisciplinary secondary survey was conducted. The data was collected from secondary sources, and the time range was not restrictive. There was, however, a geographical limitation in the case studies, where two typical examples from the country Greece, were selected. This research places two components, slow tourism and intangible cultural heritage, on the same spectrum and attempts to create constructive reflection and trigger for creating common ground for their development in a country that has a very strong potential. The results of the research are related to the connection between alternativity and intangible cultural heritage as an inescapable necessity at the basis of the existential quest of an endlessly changing society. Any prospects that emerge require and presuppose political will within the framework of a national planning oriented towards sustainability.

The ninth chapter titled ‘Public Policies for the Digital Transformation of the Tourism Industry Within the EU Tourism Transition Pathway: A Comparative Analysis’ is written by Panagiota Dionysopoulou and Konstantina Tsakopoulou. The aim of this chapter is to provide a comprehensive and critical overview of public policies for the digital transformation of the tourism sector within the framework of the EU Transition Pathway. Desk research comprises both extensive literature review on critical issues concerning the digital transformation of the tourism ecosystem and systematic online research on EU and international bodies’ platforms (OECD, UNWTO). Content analysis has helped identify

recurring themes in policymaking, which are then explored in the framework of the barriers and challenges to the digital transition identified by the literature. This chapter explores ongoing policy responses to challenges resulting from rapid technological change and the growing technology adoption by tourism supply and demand due to the pandemic. EU policy guidance has a lead role to play to streamline smart growth in tourism, given that tourism is a fragmented economic sector, embracing private and public stakeholders who are administratively and geographically isolated from each other, differ in size and scope and may adopt conflicting agendas. Ongoing policies within the EU transition pathway are data collection and processing, building digital skills, improving digital awareness, providing public infrastructure, supporting start-ups, enhancing e-governance, networking and improving the affordability of digital solutions for tourism MSMEs.

## Chapter 1

# The Importance of Big Data Analysis: Developing Neuromarketing in Tourism Industry

*Norhidayah Azman, Ahmad Albattat and Marco Valeri*

### 1. Introduction

The process of finding trends, patterns and correlations in enormous amounts of unstructured data in order to assist in making choices that are influenced by the data is referred to as 'big data analytics'. These processes use conventional methods of statistical analysis, such as clustering and regression, and apply them to more extensive datasets with the assistance of contemporary technologies. The phrase 'big data' has been a popular buzzword ever since the early years of the new millennium, when advances in computer software and hardware made it possible for businesses to handle enormous amounts of unstructured data. Even while the tourism industry has a plethora of useful big data, the fact that it exists does not always imply that it can be used effectively. On the other hand, the term 'neuromarketing' refers to the measurement of physiological and brain signals in order to gain insight into the motives, preferences and decisions of consumers. This information can then be used to inform creative advertising, the development of new products, pricing and other aspects of marketing. There is a relationship between big data and neuromarketing due to the fact that stakeholders in the tourism industry need to be acquainted with and comprehend the vast amounts of data that are available in the company. In addition, participants in the tourist industry need to have an understanding of how to make use of big data by using the appropriate technologies that provide them the ability to derive relevant insights from the data. In light of this, the present investigation will investigate big data analysis, the value of big data analysis and how the use of big data may improve the tourism industry by allowing the creation of neuromarketing approaches to increase marketing strategies for tourism companies.

## 2. Overview of Big Data Analysis

In the modern, high-tech world, a significant amount of data in a wide range of formats are made available and devoured on a regular basis. The advancement of data science has resulted in the establishment of the idea of big data and has resulted in the production of a vast amount of new research, revealing the role of big data analytics in the generation of useful practical information (Awan et al., 2022; Hassan et al., 2022; Jayawardana et al., 2022). It may be defined as data sets that are too huge or of the incorrect kind for standard relational databases to acquire, manage and analyse in a timely way. Big data is distinguished by massive quantities, rapid velocities and a wide range of information. Old data sources are giving way to newer, more sophisticated sources of information that are more difficult to handle as a result of the effect of mobile devices, social networking, the internet of things and Artificial Intelligence (AI) (Khan & Khojah, 2022; Lv et al., 2022; Phan et al., 2022). This vast amount of data, known as big data, requires advanced technologies and tools to store, process and analyse in order to extract valuable insights and make informed decisions. Companies across various industries are investing heavily in big data analytics to gain a competitive edge and improve their operations (Obermayer et al., 2021).

The travel and hospitality sectors have recognized the potential usefulness of big data analytics and have begun to implement them (Lv et al., 2022; Zheng et al., 2022). They have developed the capacity to transform large amounts of data into important practical information and insights, for example, to enhance tourism and hospitality management and practices, both of which are seen as key benefits in the marketplace (Rahmadian et al., 2022; Valeri, 2021; Valeri & Baggio, 2020). Academics' attention has been drawn due to the emergence of the literature on big data in hospitality and tourist operations, which offers great prospects and has dynamically altered this field (Kim, 2022). Academics in the fields of tourism and hospitality from a variety of other fields have recently brought attention to the role that big data trends play in enhancing the quality of marketing plans in light of catastrophic occurrences such as the present COVID-19 epidemic (Han & An, 2022; Li et al., 2022; Solazzo et al., 2022; Valeri & Baggio, 2020; Zheng et al., 2022). Furthermore, it is imperative to enhance their decision-making processes and engage in value co-creation new innovative services while pursuing advancements in the tourism and hospitality industry (Dube, 2022; Mich, 2022).

Because people's lifestyles and living standards are always evolving, it is critical for marketers to understand and appeal to the subconscious mind of their target audience. It is necessary to produce goods that are more closely tailored to the requirements of the target marketplace to meet the needs of the clients (Beh & Lin, 2022). Since neuromarketing is considered to be a part of neuroscience, its presence in the business world is essential (Marques et al., 2022). Big data analytics are mostly used to develop holistic marketing information strategies that take into account the entirety of a firm and all available marketing channels as a whole. With this approach, a company's various departments work in unison to pursue a conscious objective, a fantastic customer experience and a positive brand image (Hsu et al., 2022; Pahus & Sunesen, 2022). In addition, by using neuromarketing researchers are capable of more accurately comprehend consumer

responses to certain brands, advertisements or slogans when they use this method, which makes use of medical technology. By utilising the technique of monitoring brain activity, commonly referred to as neuroimaging, researchers are able to gain insights into the cognitive processes and thoughts that customers experience when they are exposed to a brand or a product (Nilashi et al., 2022). Marketers often employ strategies to attract consumers without their conscious awareness. However, there is a potential risk that these tactics may be misused if not properly regulated in the near future (Assaf et al., 2022; Li et al., 2022). The objective of this research is to examine the factor that can influence the intention to use neuromarketing and the impact of neuromarketing cost as moderator variable. In addition, this research is to investigate the influence of the intention to use neuromarketing to develop holistic marketing information.

### **3. Definition of Term**

In this section, we will examine the variable that has been employed in comprehending the analysis of big data. In order to elucidate the process by which a tourism company can cultivate a valuable data analytic, four distinct independent variables are employed. The initial independent variable under consideration is the perceived ease of use, which is subsequently followed by the perceived value, perceived usefulness, and social influence. In addition, the researcher incorporates two moderating variables: intention to use neuromarketing and the cost associated with implementing neuromarketing techniques.

#### **3.1 Big Data**

This shift towards digital data has allowed for more efficient storage and analysis of information, but also raises concerns regarding personal data and confidential issues. As the amount of digital data continues to grow exponentially, it is important to develop effective strategies for managing and protecting this valuable resource. Furthermore, the increasing reliance on cloud computing and remote work has made it crucial to ensure the security and privacy of digital data, which can be achieved through encryption, access controls and regular backups. Additionally, organizations must also comply with data protection regulations to avoid legal consequences and reputational damage (Michalkó et al., 2022; Muritala et al., 2022; Pahus & Sunesen, 2022; Yan et al., 2022). The emergence of big data has revolutionized the way businesses operate, as it allows for more accurate predictions and insights into consumer behaviour. However, concerns around data privacy and security have also arisen with the increased use of big data (Alghamdi, 2022; Deng & Ni, 2022; Satheesan et al., 2022). The application of big data has allowed researchers to analyse vast amounts of data, which was previously impossible, leading to new insights and discoveries. However, the use of big data also raises ethical concerns regarding privacy and data protection (Stice-Lawrence, 2022). Although big data (BD) has the potential to enhance decision-making, performance, and offer a more precise understanding of social phenomena and the ongoing Industrial Revolution,

it also presents significant challenges in terms of security, privacy, and ethics (Elgendy et al., 2022; Li, Lyu, et al., 2022).

### **3.1.1 Big Data Analytics**

Large amounts of multidimensional data are insufficient to ensure the development of relevant knowledge. To produce value, data analytics must be described as a comprehensive process to acquire, store, analyse and interpret data in order to identify significant configurations (Fosso Wamba et al., 2020). By fusing the two dimensions of time (past, present and future) and type of intelligence/knowledge generated (data/information vs. intelligence), data analytics have been widely divided into four categories. ‘What happened?’ and other questions are the focus of descriptive analytics. The question ‘What is going on?’ is used to elicit details about the past and present. They employ statistically descriptive metrics. Exploratory analytics seek to gain understanding of the past and present by attempting to explain ‘why this happened’ and ‘why this is happening’. They employ techniques like factor and cluster analysis. The main objective of predictive analytics is to answer the question ‘What will happen?’ in order to infer knowledge about the future. They rely on techniques like forecasting techniques and regression analysis. The five ‘How to optimise?’ questions are addressed by prescriptive analytics, which also makes it easier to produce information that is focused on the future. They are founded on experiments and methods of optimization. These methods are widely used in fields such as engineering, computer science and business to improve processes and decision-making. By analysing data and identifying patterns, they can help organizations make informed choices about the future.

### **3.2 Holistic Marketing Information in Tourism**

A significant shift observed in the domain of marketing in the 21st century is the evolution from social marketing to holistic marketing, as documented by Kotler and Keller (2016). The concept of holistic marketing was developed as a response to shifts in the business landscape. The notion of holistic marketing emerged in response to changes in the corporate environment. Holistic marketing is an approach that focuses on the integration of various marketing strategies to achieve a common goal. It recognizes that marketing is not just about selling products, but also about building relationships with customers and creating value for all stakeholders. Integrated marketing and socially responsible marketing are the four components that distinguish holistic marketing (Kotler & Keller, 2016). Each of these components is described briefly below in order to highlight the diversity activities that comprise this marketing strategy. The goal of holistic marketing was to replace outdated, unprofitable customers with a new, cohesive approach that could respond to shifting client needs in a more thorough and creative way (Kotler & Keller, 2016).

Hospitality and tourism (H&T) are an industry which need the data generated from their customer to generate a useful holistic marketing information (Alyoshina, 2022; Lopes et al., 2022). This is because growing recognition of the importance of customer need and maximizing their satisfaction is the main aim of

every industry all around the world especially after the pandemic situation (Ding & Syed, 2022). With the usage of neuromarketing, it is crucial to have a thorough understanding of the consumer, as it helps to reduce marketing failures and positively affects marketing success (Bu et al., 2022; Di-Clemente et al., 2022). Currently, substantial sums are allocated for advertising campaigns. It will lead marketing professionals to monitor the needs of the brain using scanning to determine which area of the brain is responding or active when seeing advertisements; if it fails to respond, the commercial will fail the test (Tsai, 2022).

### ***3.3 Neuro Marketing***

In the late 1990s of the previous century, the term neuromarketing emerged. Neuromarketing was created by Professor Zaltman (Halkiopoulous et al., 2022). He emphasized the possibility of using contemporary technologies to photograph the human brain in hopes of understanding consumer behaviour (Alkhatib & Valeri, 2022). Neuroscience may reveal consumers' intentions and subconscious purchase decisions. Neuroscience is the 'window' into consumers' subconscious buying decisions and motives. The brain is a 'black box' that holds customers' preferences and emotions (Pupchenko, 2022; Schneider et al., 2022). Neuro-marketing studies brain processing information and makes decisions, as well as companies' in-depth interactions with the brain (Choudhury & Wannyn, 2022; Pupchenko, 2022). In addition, neuromarketing is the study of consumer brain activity to determine customer behaviour and design marketing strategies (Choudhury & Wannyn, 2022; Royo-Vela & Varga, 2022). Understanding a consumer's preferences, motivations, thought processes and concepts are the essence of neuromarketing. It is a method for determining their responses to particular stimuli (Strieder, 2022). Traditional marketing examines the conscious mind of the customer, such as preference, memory and emotion, whereas neuromarketing investigates the subconscious mind of the customer, such as preference, memory and emotion (Choudhury & Wannyn, 2022). Neuromarketing surpasses traditional marketing in its pursuit of consumer information (McInnes et al., 2022; Morton, 2022).

### ***3.4 Intention to Use Neuromarketing***

A behavioural intention is a desire to accomplish a certain future behaviour and is a major predictor of an individual's actual technology use (Elouadifi & Essakalli, 2022; Remigious Ezeugwu et al., 2022). Intentional behaviour is a prerequisite for the real adoption of any system. According to Birknerová et al. (2022), the connection between predictors and particular system adoption was significantly mediated by behavioural intention. Prior research has shown that a person is more likely to accept a technology if he or she intends to utilize it. The social sciences literature has given evidence that behavioural intention has a direct effect on actual usage (Birknerová & Zbihlejšová, 2021; Köhler, 2022), and several research have found that behavioural intention has a substantial effect on neuromarketing adoption (Attíé et al., 2021; Wicinski, 2022).

### **3.5 Perceived Ease of Use**

Perceived ease of use can be defined as the degree of simplicity involved in utilizing an information system (Elouadifi & Essakalli, 2022). Subsequently, Utami (2021) stated that the user-friendliness of the technology and information system would increase its popularity among consumers. According to Kaul (2022), the implementation of a straightforward system can contribute to the enhancement of both individual and organisational performance. Neuromarketing has the potential to provide various benefits to enterprises, such as cost reduction, risk management, and facilitation of efficient decision-making. The UTAUT model employed the constructs of performance expectancy and effort expectancy to integrate the concepts of perceived usefulness and ease of use as originally examined in the TAM study. While the UTAUT model suggests that the construct of Effort Expectancy plays a crucial role in determining the acceptance of information technology by users, it is important to note that concerns regarding ease of use may diminish in significance over prolonged and consistent usage (Marchewka & Kostiwa, 2007). Hence, it can be anticipated that the perceived ease of use would primarily hold significance during the initial phases of adopting a novel technology, thereby exerting a favourable influence on the perceived usefulness of said technology. The adoption of neuromarketing is contingent upon user considerations regarding its usability, which encompasses the management of extensive and diverse data (Fu et al., 2022). However, there is variation in the level of complexity and the ease with which individuals can utilise information obtained from neuromarketing.

### **3.6 Perceived Value**

The term ‘perceived value’ relates to the monetary and psychological evaluation of the costs and advantages of using big data analytics. Companies in the tourism and hospitality industries are well-known for weighing the monetary and psychological costs of an action against the advantages they obtain from adopting that action (Cardoso et al., 2022). If the advantages of doing something surpass the expenses, it is viewed as having a high degree of value. In other words, tourist and hospitality businesses are likely to maximize value (Windasari et al., 2022). In the context of bike-sharing programmes, tourist and hospitality businesses may gain usefulness, convenience and enjoyment, although at the cost of service fees and deposits (Naim, 2022; Royo-Vela & Varga, 2022). Ali Gaafar and Al-Romeedy (2022) confirmed the considerable impact of perceived value on the choice of tourist and hospitality firms to employ big data analytics. Bu et al. (2022) further explained the impact of perceived value on the use intention of tourism and hospitality firms towards the use of big data analytics. Therefore, tourism and hospitality firms are more likely to continue adopting big data analytics services the more they trust in their value (Adeola et al., 2022; De-Frutos-Arranz & López, 2022).

### **3.7 Perceived Usefulness**

Perceived usefulness (PU) may be defined as if a person believes utilizing the system would increase their work performance (Alimardani & Kaba, 2021). PU is the most prevalent variable and the key driver of technology adoption and PU is also anticipated to be the primary driver of intention to employ neuromarketing in the tourism and hospitality sector in this research (Bastiaansen et al., 2022; Hosseini, 2023). PU is a crucial variable in research of innovation adoption intentions from the user's standpoint (Lei et al., 2022). The prior literature has offered evidence of a positive link with intention to use, which has been effectively quantified in a variety of domains, including the field of neuromarketing, but research on how intention does not affect the adoption of neuromarketing are limited (Bu et al., 2022; Lei et al., 2022; Royo-Vela & Varga, 2022). The user cannot form a favourable opinion of the use of neuromarketing in the tourist and hotel business unless they see its practical value.

### **3.8 Social Influence**

The notion of social influence created by Venkatesh et al. (2003) and expanded in UTAUT2 (Venkatesh et al., 2012) analyses the impact of what others (friends and family) believe about this technology. In a professional setting, the opinions of supervisors and co-workers are also crucial (Elouadifi & Essakalli, 2022). According to several publications on the issue, colleagues and superiors within an organization exercise social influence in the work and professional setting. In an organization, the opinion from employee and customer usually should be considered when it comes to decision-making that will involve the entire organization (Ciocodeică et al., 2022; Kaul, 2022). According to Pupchenko (2022), employees are responsible for directly engaging with customers and gathering information related to changes in customer trends and other relevant factors. The significance of individuals' viewpoints, particularly in relation to the integration or application of emerging technologies like neuromarketing, lies in their ability to ascertain appropriateness and effectiveness, thereby yielding advantages for both employees and customers (Semenov, 2022).

## **4. Research Methodology**

Due to the pandemic situation, we used an online Google form to collect data from tourism industry CEOs and managers from various departments, including human resources, finance, marketing and sales, who have knowledge of big data and information systems from June to December 2021. The data collected will be analysed to identify the impact of the pandemic on the tourism industry and to develop strategies for recovery and growth in the post-pandemic era. Prior to data collection, a pilot survey was conducted at the heritage site to validate the questionnaire. In addition, they contribute to the conceptual framework development for this study. The partial least squares (PLS) method, a composite-based structural equation modelling instrument, was employed to evaluate the study

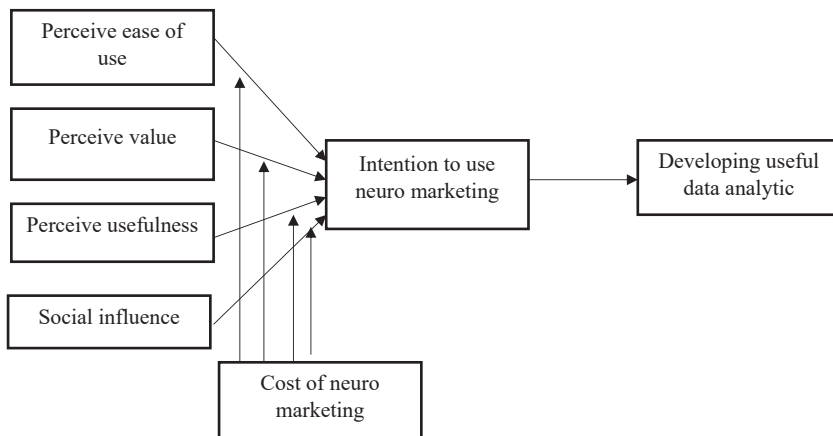


Fig. 1. Conceptual Framework.

model depicted in Fig. 1 (Rigdon, 2013; Trinchera & Russolillo, 2010). The SmartPLS software was used for the statistical analysis (Ringle et al., 2015). SmartPLS is popular because it can be used to create both retrospective and prospective assessment tools. It's especially helpful for dissecting intricate causal chains in the social sciences.

## 5. Finding

The measured model was evaluated based on tests of reliability and validity. Four indicators were assessed as part of the reliability test: Standardize indicator loading (SIL), Cronbach's Alpha (CA), composite reliability (CR) and average variance extracted (AVE). The values of SIL, according to Hulland (1999), must score above 0.70. According to Table 1, all SIL score more than 0.70. The range of factor loading scores spans from a minimum of 0.711 to a maximum of 0.889. According to the findings of Bagozzi and Yi (2012), it is recommended that the composite reliability (CR) value be higher than 0.70. As indicated in Table 2, all the CR value are above 0.70 between the range 0.722 and 0.908. For CA value, according to Garver and Mentzer (1999), similar with SIL and CR value must score more than 0.70 and as presented in Table 2, all the scores are meeting the requirement where the range is between 0.759 and 0.846. The AVE of every construct should be above 0.5 (Fornell & Larcker, 1981; Hock & Ringle, 2010). According to Table 2, all the AVE score in this study score more than 0.5 with the range from 0.612 to 0.751.

Given a factor loading threshold of larger than 0.70, indications of factor loading on the designated construct must exceed loadings on all other constructions (Hair et al., 2011, 2017). Table 1 shows that all factor loading scores are greater than 0.7, ranging from 0.711 to 0.889. This suggests that the assigned construct has a strong relationship with the observed variables and is a good