



**DESTINATION ATTRIBUTES, IMPROVEMENT PRIORITY, AND
CULTURAL INFLUENCE ON TOURISTS' BEHAVIOR EVALUATION
USING USER-GENERATED CONTENT IN LANGKAWI ISLAND,
MALAYSIA**

By

JI GUANGMENG

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

March 2023

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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Chairman : Associate Professor Ng Siew Imm, PhD
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The attractiveness of a tourism destination determines its tourist arrivals and local tourism revenue. Currently, studies exploring destination attributes using user-generated content (UGC) are scarce, such as using machine learning to identify destination attributes, using dynamic methods to determine attribute improvement priorities, and the influence of country culture on tourist preferences and evaluations. Hence, this study focused on exploring the destination attributes that promote the attractiveness of Langkawi Island using UGC. This island was chosen as the case study of this research because, despite Langkawi Island's popularity, it is at a disadvantage in competition with the islands of neighboring countries (e.g., Bali and Phuket) and is considered dull and unattractive by tourists. This study sought to achieve three objectives, as follows: 1) to identify the destination attributes of Langkawi Island; 2) to track the dynamic trends of destination attributes of Langkawi Island; and 3) to establish the influence of culture on tourists' preference and evaluation of destination attributes. Unlike traditional research, the data set used in this study was user-generated content (UGC), known as big data. The UGC was collected from Tripadvisor and contained both structured rating scores and unstructured text reviews of tourists' travel experiences on Langkawi Island. Three main analyses were conducted to answer the research questions. First, this study extracted destination attributes from online reviews and compared them to pre-established attributes. The findings demonstrated that machine learning methods can extract more specific attributes from online reviews and are thus capable of identifying new attributes to supplement existing research. The specific island attributes extracted were 'ticket purchasing', 'animal feeding', 'animal show', 'water fall, and 'food market'. Second, the time dimension was introduced to importance-performance analysis (IPA) and asymmetric impact performance analysis (AIPA) to conduct dynamic importance-performance analysis (DIPA) and dynamic asymmetric impact performance analysis (DAIPA) that were used to determine destination attribute improvement priorities. According to the findings of the IPA and DIPA, the attributes that are in desperate need

of improvement are those with increasing/high importance scores and decreasing/low performance scores, namely 'snorkeling', 'amenity', 'sky bridge walk', 'food market', and 'duty-free mall'. In addition, considering the asymmetric effect result from DAIPA, the attributes whose impact asymmetry and performance are both decreasing/low also need to be improved, which are 'service', 'island view', and 'waterfall'. Finally, the relationships between Hofstede's cultural dimensions and tourist preferences and evaluations were investigated to explore the influence of national culture on tourist behavior. The results showed that national culture affects tourist preferences only for activities. That is, power distance is positively related to water activity, individualism is negatively related to animal feeding but positively related to water activity, uncertainty avoidance is negatively related to the sky bridge walk, long-term orientation is positively related to snorkeling, indulgence is positively related to animal feeding but negatively related to water activity, and masculinity is negatively related to water activity but positively related to the waterfall. National culture also demonstrated a stronger influence on rating evaluations than sentiment evaluations. In addition, power distance, individualism, and masculinity were found to have positive relationships with tourist evaluations. Conversely, uncertainty avoidance, long-term orientation, and indulgence exhibited negative relationships with tourist evaluations. The findings on the influence of national culture on tourists' preferences and evaluations provide useful guidelines on how managers should design and promote tourism offerings that appeal to the cultural background of tourists. For example, tourists from high power distance cultures such as Saudi Arabia, the Philippines, Qatar, and the United Arab Emirates can be recommended to visit high-end attractions or activities (e.g., parasailing and snorkeling). Additionally, managers should focus on improving the satisfaction of tourists from low individualism (such as Indonesia and China) and high indulgence (such as Mexico and Australia) cultures by providing them with interesting tourism activities, such as animal performance shows, museum and art gallery tours, excellent hospitality and services, as well as adventurous snorkeling activities. The important theory contributions are as follows: First, this study expanded the method of destination attribute identification using UGC. Second, Kano's three-factor theory was extended to a dynamic analysis of the impact of attribute performance on tourist satisfaction. Third, the role of Hofstede's cultural dimensions in tourists' preferences and evaluations in the online environment was explored. Finally, a method for quantifying tourists' preferences in text review was proposed.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**ATRIBUT DESTINASI, KEUTAMAAN PENAMBAHBAIKAN
DAN PENGARUH BUDAYA TERHADAP PENILAIAN TINGKAH LAKU
PELANCONG MENGGUNAKAN KANDUNGAN JANA PENGGUNA DI
PULAU LANGKAWI, MALAYSIA**

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Daya tarikan destinasi pelancongan boleh menentukan ketibaan pelancong dan hasil pelancongan tempatan. Kini, kajian-kajian menerokai ciri-ciri destinasi yang menggunakan kandungan janaan pengguna (user-generated content, UGC) adalah terhad, seperti menggunakan pembelajaran mesin (machine learning) untuk mengenal pasti ciri-ciri destinasi, kaedah-kaedah dinamik untuk menentukan keutamaan penambahbaikan ciri-ciri dan pengaruh budaya kebangsaan terhadap pemilihan dan penilaian pelancong. Oleh itu, kajian ni memberi tumpuan kepada penerokaan ciri-ciri destinasi yang mempromosikan Pulau Langkawi dengan penggunaan UGC. Pulau Langkawi dipilih sebagai kes kajian bagi penyelidikan ini kerana Pulau Langkawi berada dalam kedudukan yang lebih lemah berbanding dengan pulau-pulau lain di negara jiran (contohnya Pulau Bali dan Pulau Phuket) dan juga dianggap bosan dan tidak menarik bagi pelancong, walaupun ia tetap merupakan satu destinasi pelancongan yang amat popular. Kajian ini bertujuan untuk mencapai tiga objektif, seperti berikut: 1) mengenal pasti ciri-ciri destinasi Pulau Langkawi; 2) untuk mengesan kecenderungan dinamik ciri-ciri destinasi Pulau Langkawi; dan 3) untuk mewujudkan pengaruh budaya terhadap pemilihan dan penilaian ciri-ciri destinasi pelancong. Berbeza dengan penyelidikan tradisional, set data yang digunakan dalam kajian ini adalah kandungan janaan pengguna (UGC) yang dikenali sebagai data raya (big data). Kandungan UGC tersebut dikumpulkan dari Tripadvisor yang mengandungi kedua-dua skor penilaian berstruktur dan ulasan teks tidak berstruktur pengalaman yang dikongsikan oleh pelancong di Pulau Langkawi. Tiga analisis utama telah dijalankan untuk menjawab persoalan kajian. Pertama, kajian ni mengekstrakkan ciri-ciri destinasi daripada ulasan dalam talian dan membandingkannya dengan ciri-ciri yang telah ditetapkan sebelum ini. Hasil penyelidikan menunjukkan bahawa kaedah pembelajaran mesin dapat mengekstrakkan ciri-ciri yang lebih spesifik daripada ulasan dalam talian and justeru lebih berkemampuan dalam mengenal pasti ciri-ciri yang baru untuk menambah kepada penyelidikan yang sedia ada. Ciri-ciri pulau tertentu yang telah diesktrakkan termasuk

‘pembelian tiket’, ‘pemberian makanan kepada haiwan (animal feeding)’, ‘persembahan haiwan’, ‘air terjun’, dan ‘pasar makanan’. Kedua, dimensi masa diperkenalkan kepada Analisis Kepentingan-Prestasi (Importance-Performance Analysis, IPA) dan Analisis Impak-Prestasi Asimetri (Asymmetric Impact-Performance Analysis, AIPA) untuk menjalankan Analisis Kepentingan-Prestasi Dinamik (Dynamic Importance-Performance Analysis, DIPA) dan Analisis Impak-Prestasi Asimetri Dinamik (Dynamic Asymmetric Impact-Performance Analysis, DAIPA) yang telah digunakan untuk menentu keutamaan penambahbaikan ciri-ciri destinasi. Menurut hasil kajian IPA dan DIPA, ciri-ciri yang sangat memerlukan penambahbaikan merupakan ciri-ciri yang mempunyai skor peningkatan/kepentingan tinggi dan skor pengurangan/prestasi rendah, iaitu ‘selam paras permukaan (snorkeling)’, ‘kemudahan’, ‘perjalanan SkyBridge’, ‘pasar makanan’, dan ‘pusat membeli-belah bebas cukai’. Di samping itu, menurut hasil kajian kesan asimetri daripada DAIPA, ciri-ciri yang bersifat berkurangan/rendah dalam kedua-duanya kesan asimetri and prestasi yang juga memerlukan penambahbaikan adalah termasuk ‘perkhidmatan’, ‘pemandangan pulau’ dan ‘air terjun’. Akhirnya, hubungan antara dimensi kebudayaan Hofstede serta pilihan dan penilaian pelancong dikaji untuk menerokai pengaruh budaya kebangsaan terhadap tingkah laku pelancong. Hasil penyelidikan menunjukkan bahawa budaya kebangsaan mempengaruhi pilihan pelancong hanya untuk aktiviti sahaja. Iaitu, jarak kuasa (power distance) berhubungkait dengan aktiviti air secara positif; individualisme (individualism) berhubungkait dengan pemberian makanan kepada haiwan secara negatif tetapi secara positif dengan aktiviti air; penghindaran ketidakpastian (uncertainty avoidance) berhubungkait dengan perjalanan SkyBridge secara negatif; orientasi jangka panjang (long term orientation) berhubungkait dengan snorkeling secara positif; kemanjaan (indulgence) berhubungkait dengan pemberian makan kepada haiwan secara positif tetapi secara negatif dengan aktiviti air; maskuniti/kejantanan (masculinity) berhubungkait dengan aktiviti air secara negatif tetapi secara positif dengan air terjun. Budaya kebangsaan juga menunjukkan pengaruh yang lebih kuat terhadap penilaian penarafan berbanding dengan penilaian sentimen. Di samping itu, jarak kuasa, individualisme, dan kejantanan didapati mempunyai hubungan positif dengan penilaian pelancong. Sebaliknya, penghindaran ketidakpastian, orientasi jangka panjang, dan kemanjaan menunjukkan hubungan negatif dengan penilaian pelancong. Hasil kajian yang mengenai pengaruh budaya kebangsaan pada pilihan dan penilaian pelancong memberikan garis panduan yang berguna tentang bagaimana pengurus harus merancang dan mempromosikan tawaran pelancongan yang menarik minat latar belakang budaya pelancong yang berbeza. Sebagai contoh, pelancong yang datang dari negara yang berbudaya jarak kuasa tinggi (high power distance) seperti Arab Saudi, Filipina, Qatar, dan UAE boleh disyorkan untuk melawat tempat tarikan atau aktiviti mewah seperti peluncur udara (parasailing) dan snorkeling. Selain itu, pengurus harus memberi tumpuan kepada meningkatkan tahap kepuasan pelancong yang datang dari negara berbudaya individualisme yang rendah (low individualism) seperti Indonesia dan China dan negara berbudaya kemanjaan yang tinggi (high indulgence) seperti Mexico dan Australia dengan menyediakan mereka dengan aktiviti pelancongan yang menarik, seperti persembahan haiwan, lawatan muzium dan galeri seni, layanan dan perkhidmatan yang amat baik, serta aktiviti snorkeling yang mengujakan. Terdapat beberapa sumbangan teori yang penting seperti berikut: Pertama, kajian ini memperluaskan kaedah pengenalanpastian ciri-ciri destinasi dengan menggunakan UGC. Kedua, teori tiga faktor Kano (Kano three-factor theory) diperluaskan kepada analisis dinamik mengenai kesan prestasi ciri-ciri terhadap tahap kepuasan pelancong. Ketiga, peranan dimensi kebudayaan Hofstede dalam pilihan dan

penilaian pelancong dalam persekitaran dalam talian telah diterokai. Akhir sekali, satu kaedah untuk meninjau pemilihan pelancong dalam ulasan teks telahpun dicadangkan.



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LIST OF ABBREVIATIONS

ACIA	Asymmetric Impact Competitor Analysis
AI	Asymmetric Impact
AIPA	Asymmetric Impact Performance Analysis
DAIPA	Dynamic Asymmetric Impact Performance Analysis
DGP	Dissatisfaction Generating Potential
DIPA	Dynamic Importance-Performance Analysis
IA	Impact Asymmetry
IAA	Impact-Asymmetry Analysis
IPA	Importance-Performance Analysis
LDA	Latent Dirichlet Allocation
LSA	Latent Semantic Analysis
PLSA	Probabilistic Latent Semantic Analysis
POS	Part-Of-Speech Tagging
RIOCS	Range of Impact on Customer Satisfaction
SGP	Satisfaction Generating Potential
T&T	Travel and Tourism
TF-IDF	Terms Frequency-Inverse Document Frequency
UGC	User-Generated Content
UNWTO	United Nations World Tourism Organization
VADER	Valence Aware Dictionary and Sentiment Reasoner
WITDR	World Island Tourism Development Report
WTTC	World Travel and Tourism Council

CHAPTER 1

INTRODUCTION

1.1 Research background

Over the decades, tourism has experienced continued growth and diversification to become one of the fastest-growing economic sectors in the world. Nowadays, the business volume of tourism surpasses that of oil exports, food products, and automobiles (UNWTO, 2019). It has become one of the major players in international commerce and represents a primary income source for many developing countries (UNWTO, 2019).

As one of the world's largest economic sectors, travel and tourism (T&T) creates jobs, drives exports, and generates prosperity across the world. The T&T industry is composed of a wide range of sub-sectors (e.g., catering, hotel, travel, shopping, entertainment, etc.) that serve domestic, international, business, and leisure tourists. As per the report of the World Travel and Tourism Council (WTTC), tourism contributed 10.4% to global GDP in 2018, during which T&T grew by 3.9% while the global economy grew at a rate of 3.2%. In terms of employment, T&T created 319 million jobs, which constituted 1 in 10 jobs worldwide. Apart from that, in the past five years, one-fifth of newly created jobs were related to tourism.

In Malaysia, tourism plays a vital role in economic development and employment where the contribution of tourism to the nation's economy is only second to manufacturing (Mosbah, 2014). In 2018, Malaysia's tourism revenue reached USD 47.2 billion, accounting for 13.3% of GDP, while the sector provided 1.767 million jobs, comprising 11.9% of employment; these were higher than the world averages of 9.9% and 10%, respectively (WTTC, 2019). In terms of inbound tourism, international tourism revenue was USD 19.7 billion, making up 7.9% of total exports. However, Malaysia's tourism revenue is much lower than that of its neighboring countries, such as Thailand, the Philippines, and Indonesia, which earned USD 109.5 billion, USD 81.5 billion, and USD 62.6 billion, respectively (see Table 1.1).

Table 1.1 : Contribution of tourism industry in Southeast Asia

Countries	Contribution to GDP		International Visitor		Contribution to Employment	
	Total T&T GDP (USD billions)	Total Economy (%)	Visitor Spend (USD millions)	Total Export (%)	Quantity of Job (millions)	Total Employment (%)
Malaysia	47.2	13.3	19.7	7.9	1.767	11.9
Philippines	81.5	24.7	8.8	8.4	10.944	26.4
Vietnam	22.4	9.2	9.98	3.9	4.029	7.4
Indonesia	62.6	6.0	15.5	6.8	12.966	12.3
Thailand	109.5	21.6	70.1	20.8	5.991	15.9

[Source : WTTC (2019)]

Accordingly, in view of the important role of tourism in Malaysia's economic development and employment and its disadvantaged position in competition with neighboring countries such as Thailand, the Philippines, and Indonesia, this study focuses on Malaysian tourism industry in order to promote the further development of the nation's economy.

1.1.1 Tourism and destination attributes

The tourism industry is the sum of all businesses that directly provide products or services to facilitate business, pleasure, and leisure activities away from their home base (Leiper, 1979). According to tourist source areas, the tourism industry can be divided into inbound tourism and domestic tourism. In driving economic growth, inbound tourism and domestic tourism have different channels (Lee, 2021). Domestic tourism can affect economic growth through four channels. Firstly, tourism can stimulate investment in building new infrastructure, creating more job opportunities and rooms for competitions (Brida, Cortes-Jimenez, & Pulina, 2016). Secondly, tourism can drive the development of other industries, such as agriculture, fishing, manufacturing, construction, and other service industries, through direct, indirect, and induced effects (Sak, 2012). Thirdly, tourism helps create employment opportunities, which subsequently increases citizens' income and stimulating new consumption through multiplier effects (Brida et al., 2016). Lastly, tourism promotes the expansion of the scale and scope of economies, which can lead to cost advantages in tourism-related industries such as accommodation and catering (Lee, 2021).

Inbound tourism is considered as a non-standard type of export. Thus, in addition to the above four channels, inbound tourism can also stimulate economy through the following two channels: Firstly, inbound tourism can help boost a destination's foreign exchange revenues (Brida et al., 2016). Secondly, inbound tourism contributes to the opening of a destination by enhancing trade activities between the destination and its trading partners (Lee, 2021). Given that inbound tourism contributes significantly to economic development and stimulates the economy through more channels than domestic tourism, this study focuses on inbound tourism.

Tourism involves places and spaces that are embedded in cultures, economies, and the social lives of communities (Saraniemi & Kylänen, 2011). A tourism destination is the space and place where tourism activities occur, which can be a country, region, or city (Kim, Joun, Choe, & Schroeder, 2019). It is regarded as a locality, a production system, an information system, or a composition of services including activities, facilities, and attractions (Framke, 2002).

Destination attributes cover an amalgam of different destination elements such as attractions (e.g., ocean view), activities (e.g., snorkeling and parasailing), amenities, and services (toilet and ticket purchasing) (Kim, 2014; Lew, 1987) that have an important impact on tourists' travel decisions (Mussalam & Tajeddini, 2016), travel experiences (Moon & Han, 2018), and satisfactions (Taecharungroj & Mathayomchan, 2019). Indeed, researchers have found that tourists usually compare destination attributes, especially attractions and activities, before searching for or choosing a destination

(Mussalam & Tajeddini, 2016; Turner & Reisinger, 1999). While traveling, tourists obtain travel experience through various destination attributes (Moon & Han, 2018), and thus destination attributes can affect tourist experience and satisfaction (Kozak, 2003). Therefore, this study focuses on the destination attributes of Langkawi Island across time and place using UGC extracted from Tripadvisor. By doing so, it aims to uncover valuable findings for the design of strategies to enhance the island's attractiveness. Hence, this study aims to examine the destination attributes of Langkawi Island with the objective of generating significant insights that could inform the development of strategies aimed at augmenting the appeal of the island.

1.1.2 Island tourism in Malaysia

The World Island Tourism Development Report (WITDR) pointed out that the global tourism industry has continued to grow in the past 13 years, of which island tourism is an important part. According to the United Nations World Tourism Organization (UNWTO), islands are the most visited destinations by tourists each year. Furthermore, island tourism plays an pivotal role in a nation's economy. More than 40% of island tourism revenues account for over 20% of local GDP worldwide. Especially for island destinations that lack the support of primary and secondary industries, tourism is essential to driving local development (WITDR, 2019).

Malaysia has a land area of 330,345 square kilometers and a coastline of 4192 kilometres. The country is located near the equator with a tropical climate of temperatures ranging from 21 °C to 32 °C. The warm climate as well as beaches and islands are one of key factors that attract tourists. Malaysia's greatest strength lies in its stunning natural environment, cultural diversity, and friendly people (Mosbah, 2014). Entertainment, business events, and shopping are the most attractive activities for tourists (Mosbah, 2014).

According to Malaysia's Department of Survey and Mapping, the country has 878 islands and 510 offshore geographical features that are not categorized as islands, such as ridges, sandbanks, or rocks. Some of them are habitable and accessible, while others have neither been explored nor inhabited. There are many well-known tourism islands in Malaysia, such as Langkawi Island, Penang Island, and Tioman Island. Among these, Langkawi is one of the most popular in Malaysia (Abu Bakar & Hassnah Wee, 2021).

1.1.3 Tourism in Langkawi

Langkawi tourism's initial development was evident in 1948 (Din, 1993). At this stage, due to limited infrastructure and accessibility, tourist arrivals are still few, and thus tourism has a minimal impact on the economy (Omar, Othman, & Mohamed, 2014). In the mid-1980s, Langkawi Island was intensively promoted as a holiday destination (Omar et al., 2014). To facilitate the development of tourism, the federal and local governments built a large number of infrastructure and entertainment facilities, such as hotels and golf courses (Din, 1993; Marzuki, 2009). In 1987, Langkawi was opened as a duty-free port, which accelerated the development of tourism. In 1986, the island

received a total of 209,763 tourists (Omar et al., 2014). Ten years later, that number had jumped to 1,795,406 (Omar et al., 2014). By this time, Langkawi had transformed from an idyllic tropical island predominantly characterized by fishing and agriculture to a modern island dominated by tourism (Omar et al., 2014). As of present, tourism constitutes 70% of the island's GDP (Abu Bakar & Hassnah Wee, 2021).

To position Langkawi as an international tourist destination, the local government agency Langkawi Development Authority (LADA) was established in 1990. LADA continued its efforts to promote and advertise the island to a global audience, particularly through Visit Malaysia Year 2007 promotional campaigns (Omar et al., 2014). Additionally, the island has extended the MICE market season by hosting the biennial LIMA. Currently, Langkawi is one of the top ecotourism islands and destinations globally, receiving the prestigious "Traveler's Choice" award for three consecutive years from TripAdvisor (LADA, 2020). Additionally, Google has identified Langkawi as one of the most frequently searched places (LADA, 2020; Musa, Ghadas, & Kadir, 2023).

Despite experiencing significant growth, the tourism industry in Langkawi has not been able to establish a competitive edge when compared to other islands such as Phuket in Thailand and Bali in Indonesia. As shown in Table 1.2, from 2014 to 2020, tourist arrivals in Langkawi were much lower than those in Phuket and Bali. In 2019, for example, the number of tourist arrivals in Phuket was 49,054,753, in Bali it was 16,820,249, and in Langkawi it was only 3,924,326, which was far lower than the other two islands. The tourist arrival growth rate of Langkawi was seen to have fluctuated and was lower than that of the other two islands.

Table 1.2 : Tourist arrivals in Langkawi, Bali, and Phuket between 2014 and 2022

Year	Langkawi		Bali		Phuket	
	Tourist arrival	Growth rate	Tourist arrival	Growth rate	Tourist arrival	Growth rate
2022	2,581,605	135.99%	--	--	--	--
2021	1,093,937	-39.31%	4,352,234	-22.92%	230497	-96.56%
2020	1,802,602	-54.07%	5,646,662	-66.43%	6,702,396	-86.34%
2019	3,924,326	8.14%	16,820,249	6.27%	49,054,753	2.16%
2018	3,628,951	-1.36%	15,828,464	9.67%	48,019,195	5.30%
2017	3,679,158	1.23%	14,433,372	6.35%	45,602,422	7.42%
2016	3,634,517	0.29%	13,571,617	21.73%	42,452,892	2.75%
2015	3,624,149	0.66%	11,148,935	9.72%	41,283,511	264.95%
2014	3,600,511	5.10%	10,160,945	-0.90%	11,312,037	-0.25%

[Source : LADA website, Statistic of Bali Province website & TAT intelligence centre (2023)]

1.1.4 User generated content

The world has entered the era of Web 2.0. As a result, changing the way consumers search for product or service information and sharing their experiences. Consumers no longer passively accept product information from enterprises but begin to express and

disseminate their opinions on products themselves (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). The interaction among consumers has also become more frequent (Kaplan & Haenlein, 2010). As a result, internet users spend large amounts of time sharing experiences online, hence generating a lot of data. This has spawned the arrival of the 'big data' era based on user-generated content (UGC).

UGC was born with Web 2.0, where the interaction mode between users and websites has changed. Users are not only limited to browsing the information on websites but they can also independently create content (Wong, Rasoolimanesh, & Pahlevan Sharif, 2020). UGC comes from regular people who spontaneously provide data, information, or media through the internet (Krumm, Davies, & Narayanaswami, 2008), such as product reviews on shopping websites and videos on social media. Given that UGC is produced voluntarily by individuals, it provides access to consumers' opinions and insights. This is vital in identifying the key attributes of products or services (Shin & Nicolau, 2022). Additionally, unlike traditional questionnaires, UGC is posted by customers spontaneously without laboratory effect; thus, it is considered more objective, immense, and without sample bias (Schuckert, Liu, & Law, 2015).

However, UGC data is not without limitations. Fake reviews generated by individual fraudsters or professionally organized review campaigners may have an impact on credibility research findings (Choi, Mattila, Van Hoof, & Quadri-Felitti, 2017; Rahman, Carburnar, Ballesteros, & Chau, 2015). Fortunately, advanced computer technology can identify and filter out fake reviews (Jia, 2020). Moreover, previous studies have shown that fake reviews have less influence on research (Hao, Zhang, Wang, & Gao, 2017; Liang, Liu, Chen, & Jiang, 2018).

1.2 Problem statement

1.2.1 Industry issues

There are two issues that require attention in Langkawi as a travel destination. Firstly, Langkawi exhibits a deficiency in terms of possessing a competitive edge and fails to manifest sufficient allure for prospective tourists. As mentioned earlier, as an international tourist destination, Langkawi is less advantageous to neighboring islands. In addition, despite Langkawi Island's popularity, many tourists regard it as dull and unattractive because Langkawi does not offer many activities or experiences (Abu Bakar & Hassnah Wee, 2021). Therefore, for the management of Langkawi Island, it is urgent to capture tourists' attentions and their preferences by providing tourist activities that can meet their needs, subsequently increasing the island's attractiveness and enhancing its competitiveness.

Secondly, the preferences of tourists from different cultures have not been identified and processed. Individuals from different cultures have different cognitive styles, behavioral rules, and values. These unique differences may influence individuals' lifestyles, work patterns, and consumption behaviors (Rinuastuti et al., 2014). Traveling to a new place often involves experiencing a cross-cultural encounter (Manrai & Manrai, 2011). Thus,

tourists from different cultural backgrounds may exhibit different preferences and consumer behaviors when planning a trip and experiencing a destination. Langkawi is positioned as an international tourist spot, with tourists from all over the world. Therefore, it is necessary to identify and process the preferences of tourists from different cultural backgrounds to facilitate accurate marketing and provide personalized services to enhance Langkawi's attractiveness.

1.2.2 Theoretical gaps

In recent years, many scholars have studies on UGC within the domain of tourism and hotel. Compared to survey data, big data analytics can provide sufficient data without sampling bias, enabling both academia and industries to better understand tourist behavior (Li, Pan, Law, & Huang, 2017). Moreover, UGC often records data for several consecutive years, making it possible to study the attributes of tourist destinations from the perspective of time series. UGC data also effectively reduces the cost and difficulty of cross-cultural and cross-regional tourism research, involving reviews from users

In the present stage, tourism research using UGC data encompasses the areas of hotel service quality (Ahani, Nilashi, Ibrahim, Sanzogni, & Weaven, 2019), destination satisfaction (Guo, Barnes, & Jia, 2017), and tourists' behaviors (Zhang, Chen, & Li, 2019a). Scholars have also begun to use big data to study the attributes of tourism-related products such as hotels and restaurants. For example, Guo, Barnes, and Jia (2017) extracted 30 key product dimensions from 266,544 reviews of 25,670 hotels in 16 countries. Likewise, Mehraliyev, Kirilenko, and Choi (2020) used Yelp data to extract the product attributes of restaurants in terms of the five sensory dimensions (i.e., sight, smell, sound, taste, and touch). However, there are still relatively few studies on destinations using UGC data. From the review of the island tourism literature in particular, three gaps remain prevalent and require closure.

First, there are no unified evaluation dimensions for island tourism activities. Unlike hotels that have clear attributes, attractions in island destinations are highly complex and diverse, making it difficult to identify salient attributes that drive tourists' behavior (Taecharungroj & Mathayomchan, 2019). There is minimal variation among hotels in various regions and countries. Hotels are primarily assessed by scholars based on six key dimensions: location, cleanliness, service, value, room, and sleep quality (Bi, Liu, Fan, & Zhang, 2020; Wong et al., 2020). The tourist attractions exhibit significant variations. One notable aspect of heritage tourism lies in its emphasis on historical and cultural elements (Olorunsola, Saydam, Lasisi, & Ozturen, 2023), whereas island tourism primarily revolves around the allure of abundant sunshine, coastal waters, and sandy beaches (Abu Bakar & Hassnah Wee, 2021). Therefore, extracting and evaluating destination attributes from UGC is more complicated, and few studies have attempted to do so. Instead, most studies that looked at destination attributes have resorted to using the questionnaire survey research strategy, despite its limitations of sample bias and predetermined attributes (Kim et al., 2019). For example, Park et al. (2019) investigated economic and natural destination attributes in Langkawi and found their significant impact on tourists' willingness to revisit. Khasimah Aliman, Mohamed Hashim, Dalela Mohd Wahid, and Harudin (2014) also focused on Langkawi but reported different

attributes such as cleanliness, nature, and shop fronts. UGC is considered more authentic and trustworthy than data collected through questionnaires and interviews, meaning that findings from UGC data are more valid and "real" (Guo et al., 2017). Therefore, the current study attempted to use the Latent Dirichlet Allocation (LDA) model to extract destination attributes from UGC in the form of online travel reviews.

Second, research on dynamically evaluating destination attributes is still scarce. In conventional research, data is usually collected cross-sectionally using surveys (Kim et al., 2019). However, the cost of surveys is high in terms of time and money (Bi, Liu, Fan, & Zhang, 2019), especially if data needs to be collected continuously for several years or via a longitudinal design. Therefore, it is difficult to use questionnaire data to dynamically analyze destination attributes. As a result, most research has ignored dynamic trends in attributes' importance and performance as well as the asymmetric effects of attribute performance on overall satisfaction (e.g., Albayrak, Dursun, Caber, Hoc, & Fong, 2021; Luo, He, Mou, Wang, & Liu, 2021).

The evaluation of tourists' satisfaction is usually determined by their previous usage of services or products (Bi et al., 2020). Consequently, tourist expectations can be affected by tourist evaluations, which may continuously change over time. To reduce uncertainty, tourists tend to search and read online reviews, which are regarded as electronic word-of-mouth or eWOM, before traveling (Wong et al., 2020; Fang, Ye, Kucukusta, & Law, 2016). Attributes of attractions with highly rated online reviews may lead to tourists' high expectations and low satisfaction, or vice versa. This initial asymmetric influence may gradually turn into a symmetrical influence (Bi et al., 2020). Therefore, this study proposes that it is worth constructing dynamic approaches to explore the symmetric and asymmetric impacts of attribute performance on satisfaction.

There are still relatively few studies using UGC to examine the impact of national culture on consumer behavior and preferences in an online environment. Hofstede's cultural dimensions have been widely used to explain variations in tourists' behavior (Manrai & Manrai, 2011). For example, Cassidy and Pabel (2019) found that tourists from Australia and Canada, who are high in individualism and uncertainty avoidance, tend to post fewer comments and spend more time searching for travel information. Similarly, Huang and Crotts (2019) reported that individualism and indulgence are positively correlated with tourist satisfaction, while power distance and long-term orientation are negatively correlated with tourist satisfaction. However, these studies were based on survey or interview data, and few studies used UGC to uncover tourists' behavioral or perception differences in an online environment. Thus, there is a gap in tourism and culture research in investigating if behavioral and perception differences exist in UGC as they do in questionnaire research.

Looking at Langkawi Island's issues and theoretical gaps in the literature, it is imperative to conduct research to uncover the destination attributes that drive visitations in order to prevent the deterioration of Langkawi's tourism. Under the theory of customer perceived value, Zeithaml, Varadarajan and Zeithaml (1988) pointed out that when enterprises provide customers with valuable products or services, they should take the customers' perception of value as a key performance indicator, given that the value experienced by

customers may not be the same as that which enterprises aim to serve. In this regard, online travel reviews provide detailed travel experience recommendations for tourists. However, its use has been limited in tourism research due to this data's large scale and difficulty to analyze with traditional statistical methods. Therefore, to find countermeasures that increase Langkawi's attractiveness, this research employed UGC data in combination with machine learning and statistical methods to analyze Langkawi's tourism industry at the attribute level.

1.3 Research questions

This study has three main research questions, each with their respective sub-questions, as follows:

RQ1: What are the destination attributes of Langkawi Island?

1. What are the primary destination attributes of Langkawi Island?
2. What are the differences between extracted and pre-established destination attributes?

RQ2: Which destination attributes should be prioritized for improvement?

1. How do the importance and performance of destination attributes change over time?
2. How do the asymmetric effects of attributes' performance on overall satisfaction change over time?

RQ3: What is the influence of culture on tourists' preference and evaluation of destination attributes?

1. What are the differences in destination attribute evaluations among tourists of different cultural backgrounds?
2. What are the differences in destination attribute preferences among tourists from different cultural backgrounds?
3. Are there any differences in destination ratings and sentiment evaluations among tourists of different national cultures?

1.4 Research objectives

To answer the three research questions, a total of seven research objectives were developed, as follows:

- 1b. To compare extracted and pre-established destination attributes.
- 2a. To explore trends in the importance and performance of destination attributes over time.

- 2b. To explore the asymmetric effects of attributes' performance on overall satisfaction over time.
- 3a. To compare the destination attribute evaluations of tourists from different cultures.
- 3b. To compare the destination attribute preferences of tourists from different cultures.
- 3c. To compare the sentiment evaluation and rating consistency of tourists from different cultures towards destination attributes.

1.5 Scope of the study

Destination attributes play an important role in tourists' destination choice, travel experience, and satisfaction (Moon & Han, 2018; Taecharungroj & Mathayomchan, 2019). Therefore, this study focused on destination attributes such as attractions, tourism activities, amenities, and services. The case study is Langkawi Island. Although this island is one of the top ecotourism islands and destinations in the world, it is at a disadvantage in competition with neighboring islands (e.g., Phuket and Bali) and is considered dull and unattractive by tourists (Abu Bakar & Hassnah Wee, 2021). Therefore, there is an urgent need for Langkawi Island to enhance its attractiveness and increase its competitiveness. The data used was UGC in this study. Unlike traditional questionnaires, UGC is posted by customers spontaneously without laboratory effect; thus, it is considered more objective, immense, and without sample bias (Schuckert, Liu, & Law, 2015).

Herzberg's two-factor theory and Kano's three-factor theory argue that satisfaction and dissatisfaction are caused by different aspects of stimulus and personal interaction (Lim, Cheah, Ng, Basha, & Soutar, 2021; Kakar, 2017). Thus, the satisfaction and dissatisfaction of customers can be affected by different sets of product attributes. Underpinned by Herzberg's two-factor theory and Kano's three-factor theory, this study explores the asymmetric impact of attribute performance on tourist satisfaction. Additionally, underpinned by Hofstede's Cultural Dimensions, the study also examines the influence of country culture on tourists' preferences and evaluations. Although Hofstede's framework has been criticized, such as for the fact that the country is not the best unit to study culture and the data is outdated, this framework remains to be the most influential conceptual model in cross-cultural studies and holds the highest validity (Filimonau & Perez, 2018; Hsu, Woodside, & Marshall, 2013).

The data available on Tripadvisor is from 2012 to the present. Due to the movement control order in most regions and countries during COVID-19, tourists arriving in Langkawi are very limited. In addition, the focus of this study is not to explore the impact of the epidemic on tourists' travel behavior. Thus, the data after 2019 were removed, and only the data from 2012 to 2019 were retained.

1.6 Significance of research

The current study took Langkawi as the study context to extract the attributes of Langkawi from online travel reviews and analyze the dynamic trends of each destination attribute. Then, differences in the evaluation and preferences of destination attributes among tourists from different cultures were analyzed. In doing so, the significance of this study can be viewed from both academic and practical perspectives.

1.6.1 Theoretical significance

Traditional ways of capturing consumers' perceptions of a destination are questionnaires and polls are not only time-consuming and costly but also cover limited samples. The use of big data analysis can overcome these problems of traditional methods through its sufficient sample and low cost of data collection. Besides, the process of big data collection does not involve researchers, who can affect the quality of the data. Specifically, online reviews are unstructured data where consumers can freely express their opinions without being constrained by research questions, providing a more comprehensive product information. The current study thus used machine learning and statistical methods, as well as UGC data, to analyze tourism activities.

The theoretical significance of this study can be summarized in the following five aspects: First, the methods of destination attribute extraction and sentiment evaluation are optimized by employing Latent Dirichlet Allocation (LDA) and Valence Aware Dictionary and Sentiment Reasoner (VADER). By using LDA, attributes can be automatically extracted from large online reviews that have been neglected by previous studies (Guo, Barnes, & Jia, 2017). VADER performs well in the tourism context, which can be used to measure the sentiment score of the attributes accurately. Second, the dynamic importance-performance analysis (DIPA) and dynamic asymmetric impact performance analysis (DAIPA) models are constructed and deployed to analyze the trends in destination attributes' importance and performance, as well as their asymmetric effects on overall satisfaction. Third, Herzberg's two-factor theory, three-factor theory, and Hofstede's cultural dimensions theory are extended to the field of big data on tourism destinations. Fourth, machine learning methods and statistical methods are integrated, which helps to further mine valuable information and provides new ideas for subsequent research. Fifth, this study enriches the literature on destination attractiveness by improving aspects of destination attributes and the cultural expectations of international tourists.

1.6.2 Practical significance

The current study selected Langkawi as the case study. The practical significance of this can be summarized in three aspects. First, the current study enables Langkawi tourism authorities to identify and learn about tourists' perceptions of key destination attributes, which may help them design more relevant tourism products to better serve tourists in the future. Second, the DIPA and DAIPA models show the trend of destination attributes over time, allowing managers to monitor the importance and performance of destination

attributes as well as the asymmetric impact of attribute performance on overall satisfaction. Subsequently, managers can benefit from this knowledge to improve tourism products and services. Third, the current study provides insights about the travel behavior differences of tourists from different cultural backgrounds, which may help Langkawi tourism operators to introduce packages that suit different market segments.

1.7 Definition of terms

The definitions of the constructs used in the current study are presented in Table 1.3. The four main concepts are UGC, destination, destination attribute, and culture.

Table 1.3 : Definitions of the terms

No	Construct	Definition	Source
1	UGC	User-generated content comes from regular people who voluntarily contribute data, information, or media that then appears before others in a useful or entertaining way, usually on the Web—for example, restaurant ratings, wikis, and videos.	Krumm, Davies, & Narayanaswami (2008)
2	Destination	area (place or region) that possesses several natural resources or man-made attractions that attract tourists	Gonçalves & Águas (1997)
3	Destination attributes	the elements make a contribution to tourists' cumulative experiences with their vacations	Kozak (2003)
4	Culture	collective programming of the mind which distinguishes the members of one group or category of people from another	Hofstede (1997, p.5)

1.8 Organization of the thesis

This thesis consists of seven chapters. Chapter One explains the research background, problem statement, research questions, and objectives, as well as the significance of this research. Chapter Two reviews the literature related to destination attribute mining, the improvement priority of destination attributes, and the impact of culture on tourist behavior. In Chapter Three, the hypotheses to answer the third research question are developed. Chapter Four covers the research methodology of this study, including the research paradigm, methodology framework, data collection procedure, and data analysis approaches. Chapter Five provides data analysis results to answer Research Question One (What are the destination attributes of Langkawi Island?) and Research Question Two (Which destination attributes should be prioritized for improvement?). Chapter Six reports the data analysis results to answer Research Question Three (What is the influence of culture on tourists' preferences and evaluations of destination attributes?). Finally, Chapter Seven concludes the study by highlighting the findings' discussion, implications, limitations, and future research directions.

1.9 Conclusion

In conclusion, the research background, problem statement, research questions, research objectives, research scope, and definitions were discussed in this chapter. Overall, the current study employs machine learning and statistical methods as well as UGC data to extract destination attributes, evaluate destination attributes dynamically, and conduct a cross-cultural analysis of tourist preferences and evaluations. In the following chapter, the study's theoretical foundations and related studies are reviewed.



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