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Profiling the Millennial Visitors of the Smart Museum and Satisfaction of Visit: A Case Study of the Borneo Culture Museum, Sarawak Malaysia

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Abstract: The pandemic has shifted museums to a new paradigm in which technology plays an increasingly important role in museum operations. More museums are investing in technology installations to give visitors a more distinctive and meaningful experience. Concerning technology, millennials (also called Generation Y) are an important market segment for museums. The increasing number of millennials visiting museums requires the related stakeholders to understand the millennial visitors' profile to serve them better. Hence, the purpose of this study is to assess the profile of Millennial visitors of the smart museum and investigate the role of technology in visitors' satisfaction. This study employed five trained enumerators to approach the millennial visitors at the study location, the Borneo Culture Museum in Kuching, Sarawak. The descriptive analysis was used to achieve the first objective followed by the simple linear regression for the second objective. The findings include demographic background, types of visits, source of information about the museum, travel companion, motivation to visit, time spent inside the exhibition galleries and the influence of technology on visitors' satisfaction. The findings will be helpful as an addition to the existing knowledge of the museum research and can aid the future study in extending the study related to the millennial generation and the smart museum.

Keywords: *Museum, Smart Museum, Millennials, Visitors' Profile, Borneo Culture Museum, Satisfaction*

1. Introduction

Museums, once considered a province for the elites, have now been seen as an integral part of cultural infrastructure, and in the tourism field, it is categorized as special interest tourism (Arumugam et al., 2023). As a part of the tourism industry, museums are also susceptible to unprecedented events, as observed during the COVID-19 pandemic that caused museums to lose significant revenue due to museum closures that prohibited anyone from entering museums and performing business practices in the museum areas (UNESCO, 2020). As visitors were unable to be in museums physically, they exhibited a weaker connection to museums, leading to a dwindling sense of authenticity (Kono, 2020). However, the pandemic has become the most significant catalyst for museums, as the pandemic has compelled museums to dip into technology. Due to the pandemic, museums have taken the initiative to respond through the technological angle and increase their digital practices to maintain and sustain the connection with their followers (UNESCO, 2020). Some notable examples of museums utilizing technologies can be seen in their increasing presence on social media and ensuring that their digital collections are shown and displayed more interactively and efficiently in the digital sphere. Based on a survey run by the Museum Booster (2021), COVID-19 was found to be the biggest push that drove museums to embrace digital transformation and innovative technological adoptions such as mixed reality (MR), augmented reality (AR), and virtual reality (VR).

Despite the technological shift, Malaysian museums still practice the old style of displaying their exhibitions, signalling that technological advancement in Malaysian museums is still in its infancy. The adherence to the classical display styles can be challenging against the now digital native community, especially in how to address and earn this type of visitor's favor (Fauzi et al., 2022). The community of digital natives is represented by the Millennials (Gen-Y). The Millennials are generally known to participate in leisure activities consummately, and museums and art gallery tours are top-rated among most millennials (Kim et al., 2020b). Despite their contribution to the growth and popularity of museums, few studies have been taken to understand the Millennials' role in molding tourism, comparatively to their counterparts in age-related market segments, like the baby boomers. The lack of studies led to little proof to explain Millennials' contrasting attitudes, values and behaviors regarding tourism due to the absence of any significant empirical support that

can aid management in improving their practices (Kim et al., 2020a). Therefore, the purpose of this study is to assess the profile of millennial visitors to the Borneo Culture Museum (BCM) in Kuching, Sarawak. This new and contemporary museum has become a Kuching landmark, with an eye-catching architectural design that showcases Sarawak's rich cultural heritage and distinctive traditional crafts. More than 1,000 artifacts represent the rich culture and traditions of Borneo and Sarawak's indigenous peoples. Despite other Malaysian museums being in the early stages of technology adoption, BCM has included technology in approximately 30% of their exhibitions (Fauzi et al., 2022). In addition, this smart museum offers hands-on activities and interactive educational events for younger generations. The findings of this study will be useful for the relevant stakeholders in understanding the Millennial visitors aside from adding to the existing body of knowledge about specific cohort generation and culture heritage tourism. This paper starts with a general introduction to the museum and the difference between traditional and modern museums. The later section discusses the museum development in Malaysia and the millennial generation. The third section is related to the method used in conducting the research, followed by the result and discussion. Next is the study's conclusion and the implications of the current study. The last part will discuss the limitations and recommendations for future research about the museum.

2. Literature Review

Museum and Smart Museum: Globally, museums are scattered across the globe. However, more museums have been built as decades pass, especially in the developing world, with a projected 95,000 museums to exist in 2020 (UNESCO, 2020). As part of cultural tourism attractions, the museum has gone through a revised definition to suit its latest function towards the communities. The change of definition has been acknowledged and noted by The International Council of Museums (ICOM). ICOM is the sole global association in the museum industry, and with a membership of 129 countries, it is lauded as the voice of museum professionals internationally; this association has carried numerous efforts to increase cultural awareness among the global community through cooperation efforts and global linkages (ICOM, 2024). Since the first ICOM conference in 1946, the word “museum” has been modified based on the current relevancies. The latest approved definition in the year 2022 read as:

“A museum is a not-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection and knowledge sharing” (ICOM, 2022).

Current trends in museum visits are influenced by a variety of factors, including technological advancements, evolving visitor expectations, and shifts in societal values. With the evolution of social networks, people are increasingly willing to share their cultural consumption experiences on social media platforms (Oliveira et al., 2020). In parallel with the rapid technological development, today’s visitors expect more interesting museum exhibitions as they are now shifting to new structures involving experimental activities rather than just formal and didactic methods of learning (Annechini et al., 2020). This demand became more apparent after the pandemic of COVID-19, which led the museum to operate its museum using smart technologies. Museums have traditionally used static displays, physical artifacts and limited interpretation to showcase their collections. Visitors would go around galleries, examining things behind glass cases and reading labels. Although this strategy created amazement and astonishment, it lacked interactivity and meaningful engagement for guests.

The modern museum nowadays has engaged technology in the museum operation, leading to the birth of smart museums. Compared to the conventional museum, smart museum exhibition space has a different psychological experience for the audience with the exhibition design focusing on the viewer's knowledge, the innovative use of artificial intelligence technology makes the space display form more diversified, and the exhibition design is more towards developing humanized trends (Yang et al., 2024). Digitalization has transformed how museums show and interpret their collections. The technology enables immersive and interactive displays that engage visitors and enhance their comprehension of artifacts (Yang et al., 2024). In addition, the Internet of Things (IoT) and smart space technologies support the creation of smart museums based on digital infrastructure and information systems deployed in modern museums. Technological usage can include providing visitors with interactive activities with the museum and allowing visitors to enjoy an

immersive, dynamic experience that caters to their personalization (Balducci et al., 2020).

The development of the Museum in Malaysia: The year 2023 marked the six decades of the Malaysia National Museum (DMM, 2023). Malaysia hosts 150 museums (DMM, 2024), which are divided into five categories: personal, private, institution/department, state and federal. The Department of Museum Malaysia acts as the National Museum and twenty-two federal and state museums. This guardianship covers one museum in Perlis, Selangor, Pahang, Johor and Melaka, two in Perak and Negeri Sembilan, three in Kedah and Labuan and seven in Kuala Lumpur. Museums are not governed by the department, they are under the administration of the state government, as seen in Penang, Kelantan and Terengganu. For the states in Borneo Island, thirteen museums in Sabah are under the management of the Ministry of Tourism, Culture and Environment. As for Sarawak, thirteen museums are managed by the Ministry of Tourism, Arts and Culture Sarawak.

Malaysian museums experienced 70 percent reduced visitor attendance during the pandemic, as they were unable to utilize any technological advances to their benefit, failing to draw both local and international visitors (Fauzi et al., 2022). Following this situation, Malaysian museums were faced with a tall order to ensure that the museums continue to be marketable, competitive and relevant with time (SER, 2020). After the pandemic and lockdown, the National Museum Malaysia took the initiative to launch an augmented reality (AR) smartphone application in March 2022 that features twenty-eight collections. Perak Museum followed the same course of action by launching its AR app that exhibits six galleries. Through AR utilization, prominently the QR codes, visitors can check and get information about exhibitions on their mobile phones. The move made by the Malaysian National Museum to adopt technological advances in its practices has been lauded positively, as the National Museum is the main hub for safeguarding Malaysian cultural assets. The National Museum takes another step into technological adoption by currently developing a 360-degree virtual tour prototype project for the Malaysia National Museum Kuala Lumpur's internal gallery to earn more favor among visitors (DMM, 2024).

Another museum, the Malacca Museum, is adopting advanced technology in its operation by introducing Augmented Reality and 3D mapping, and this project is expected to be operational by 2027 (BERNAMA, 2023). In Penang, efforts to incorporate technology were made before the pandemic, as twenty-one interactive museums were introduced in Georgetown in 2019 (Maliki et al., 2021). However, these interactive museums are privately supported museums, and they carry different visions and objectives from the government and state-funded museums. Apart from the above examples, the remaining museums in Malaysia have unremarkably low levels of technological adoption, with most being rudimentary, confined to museums applying virtual tours available on their social media and official websites (SER, 2020; Fauzi et al., 2022).

Borneo Culture Museum (BCM), Kuching, Sarawak: The best example of Malaysian museums showcasing their technological prowess is The Borneo Culture Museum in Kuching, Sarawak. This newly built museum, which operated in March 2022, is a testament to how Malaysian museums should apply technology. Located in the center of Kuching city, this five-story museum is modern, with distinctive architectural features reflecting Sarawak's unique traditional crafts and rich cultural heritage. Each gallery promises a fascinating and different experience to the visitors. Starting with the modern ticketing counter on the first floor, the children's gallery and 'Love our River' theme on the second floor offer an immersive experience and encourage the visitors to engage in the activities provided. The third floor brought the 'Harmony with Nature' theme, allowing the visitors to look and listen to nature's sounds through audio-visual and virtual reality. In addition, the 'Time Changes' gallery is on the fourth floor, followed by the fifth floor with the theme of the 'Objects of Desire' that offers an interactive exhibition experience. In addition to its permanent exhibitions, the museum is introducing innovative and captivating ways to present exceptional exhibits for the benefit of the community. In the year 2024, the museum conducted Luke Jerram's GAIA (The Earth) Exhibition, featuring 3D models suspended within the museum, creating a phenomenal, immersive experience and showcasing Sarawak's excellence in museology, and proudly draws over 89,000 visitors for that exhibition alone. Due to its advanced technological adaptation, this museum has reached one million visitors within two years of operation, and the tourists were amassed from fifty-five nations. For this endeavor, the Sarawak state government has used up to RM15 million budget to install digital facilities and technologies in the museum in the hope of increasing visitor experience positively (Borneo Talk, 2020).

Millennials: Studies that looked into generation cohorts have been carried out and growing due to the interest in understanding how different generations can impact diverse settings. The latest trend in research has paid more attention to the Millennial generation, as compared to their predecessor, the Baby Boomers and Generation X (Galdames et al., 2022). The Millennials, or Generation Y, are made up of people who were born between 1980 and 2000 (Kim et al., 2020b; Calvo et al., 2020; Kim et al., 2020a). In other definitions, a slightly different time interval has been used to categorize the birth years of Millennials; 1981 to 2000 (Lee, 2020), 1979 to 1999 (Galdames et al., 2022); 1977 to 2000 (Brailovskaia et al., 2020), 1981 to 1999 (Prakash et al., 2021). Even though a consensus has not been reached in dating the Millennial group, the broad understanding puts them as a generation born in the early 1980s to the mid-1990s and 2000 (Kapferer et al., 2022). In this study, Millennial is defined as people who were born between 1980-2000, replicating the similar demographics used in a study that looked at museum settings in Korea (Kim et al., 2020b).

Growing up during a period of rapid technological advancement, millennials are known for their deep familiarity with digital devices, social media, and the internet. Undoubtedly, the Millennials are technologically literate and savvy, as they have grown up and have been immersed in technology all their lives, being in constant contact with digital media, technologies and the internet (Calvo et al., 2020; Kim et al., 2020a). Unlike previous generations, they were the first to experience the transition from an analog to a digital world, making them highly adaptable to new technologies. Millennials also value a work/life balance, possess various demands, value digital connectivity, engage in social responsibility and are 'avid travellers' (Richards et al., 2020). Moreover, millennial travelers are regarded as fully digital tourists whereby they use technology in every travel stage starting from trip planning by making online reservations and finding inspiration on social media platforms, followed by exploring the destination with technology assistance and finally leaving a review and sharing their travel experience through social media (Ketter, 2020).

The Millennials are currently the most prominent group that makes up the economically active population, and most of them are raising Generation Z as parents. The influence of the Millennials should not be overlooked, as they have witnessed unprecedented challenges in the fields of social, economic and politics that had never occurred in the previous generations' time. The interest in investigating the degree of influence imparted by the Millennials on global tourism has been increasing of late. Literature favors the Millennials, attesting to their growing power in influencing the tourism field through their need to have true experiences, humanitarian efforts, and satisfactory application of Web 2.0 technologies when they embark on any tourism activities (Días et al., 2022; Du et al., 2020). As Millennial has a tight connection to technology, they are prone to put their experiences on social media, and their social media posts can generate a broad and quick marketing opportunity that can bring more visitors rapidly (Javed et al., 2020; Pencarelli et al., 2020). In line with these notions, it is imperative to understand millennial tourists' profile and motivations to benefit tourist businesses. Hence, assessing the profile of millennial visitors to the Borneo Culture Museum will provide the basis for understanding the millennial market segment at the smart museum.

Technology and Satisfaction: In the highly competitive tourism industry, visitors' satisfaction plays a critical role in the success and sustainability of tourism-related businesses. Satisfaction refers to the level of contentment that tourists feel after experiencing a product or service, and it has significant implications for customer loyalty, repeat visits, word-of-mouth promotion (Liu et al., 2024; Preko et al.,2020) and willingness to pay more (Preko et al.,2020). Understanding and improving customer satisfaction is essential for both attracting new tourists and retaining existing ones. Specifically in the museum setting, visitors' satisfaction has received continuous attention (Prayag et al., 2019), with the technology seen as a critical factor that led to visitors' satisfaction (Ibrahim et al.,2021). The previous studies highlighted the positive relationship between technology and satisfaction such as the study of the Ara Pacis Museum in Rome (Trunfio et al., 2021) which discovered that technology usage contributed to the enhancement of visitor experience and satisfaction.

In a study of the Brunei museum, visitors were found to be dissatisfied with the average technology implementation at their museum, leading the researchers to propose the museum management to invest more in technology (Ibrahim et al.,2021). In another study, the finding shows the use of immersive technology in China Museum positively improves visitors' attitudes, satisfaction and motivates them to revisit in the future (Liu et al.,2024), the utilization of the Internet of Things (IoT) in China Museum guided tour enhance the experience and convenience of the visitors that later resulted to 24.3% increase in their satisfaction (Hou,

2024). The integration of technology in tourism and museum experiences is no longer just a luxury; it has become a necessity for improving visitor satisfaction. From enhancing engagement through immersive technologies to streamlining operations and personalizing experiences, technology plays a pivotal role in meeting visitors' evolving expectations.

3. Methodology

The target population for this study is visitors to the Borneo Culture Museum in Kuching, Sarawak. This museum was chosen because this new museum uses the elements of technology in presenting its exhibits. This second-largest museum in Southeast Asia successfully changed the perception towards the museum, which can be seen through positive visitor feedback on social media. To ensure validity, expert feedback was obtained, followed by the pilot test involving 30 respondents. As for the reliability, the items were assessed using Cronbach's alpha. The sample size was determined using statistical power analysis to ensure the minimum sample size was met, and 285 respondents participated in the survey from June to September 2024. The case study approach was applied by sending enumerators to the study area to achieve study objectives. These numerators reached out to likely respondents and screened these potentials by acquiring their age to confirm whether they belong to the Millennial group (aged between 24 to 44 years old in 2024). Once qualified, respondents are given a QR code that directs them to the online Google form survey, where they must complete the questionnaire on the spot. In analyzing the Millennial visitor's profile to the Borneo Culture Museum, descriptive analysis is used and the explanation will focus on the demographic background, types of visits, sources of information, visit companion, motivation of visit and duration of the visit. In analyzing the roles of technology, a simple linear regression was used to investigate the relationship between technology and satisfaction.

4. Findings and Discussion

Demographic background: A total of 285 visitors took part in the survey with their background presented in Table 1.

Table 1: Demographic background of Millennial visitors

Details	Total Respondents	Total percentage (%)
Gender		
Male	115	40.4
Female	170	59.6
Nationality		
Malaysian	280	98.2
Foreigner	5	1.8
Age		
24-30	222	77.8
31-35	19	6.7
36-40	9	3.2
41-44	35	12.3
Education Background		
Doctoral Degree	4	1.4
Master Degree	23	8
Bachelor Degree	111	39
Diploma	94	33
A-level	10	3.5
O-level	1	0.3
High School	31	11
Others	11	3.8
Profession Background		
Government Sector	65	22.8
Private Sector	57	20

Self-employed	21	7.4
Business Owner	7	2.5
Students	118	41.4
Unemployed	9	3.1
Retiree	1	0.3
Others	7	2.5
Salary Range		
MYR3,000 and below	188	66
MYR 3,001-MYR5,000	48	16.8
MYR5,001-MYR10,000	29	10.2
MYR10,001-MYR15,000	12	4.2
MYR15,001-MYR20,000	4	1.4
MYR20,001 and above	4	1.4

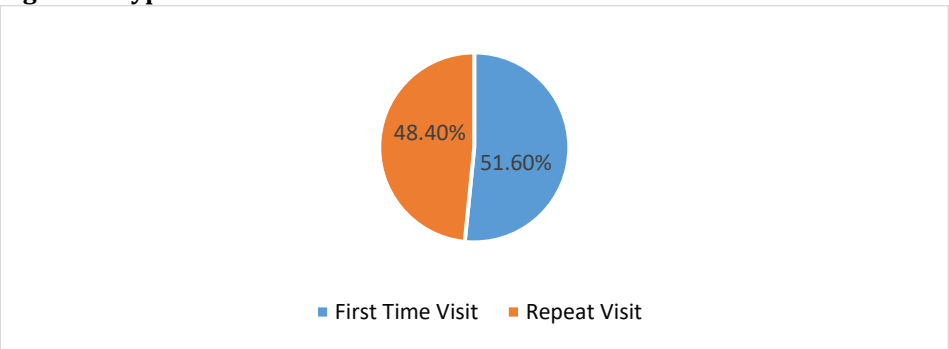
Source: Author's work

Female respondents contributed 59.6% (n=170), while male respondents comprised 40.4% (n=115). In this study, an overwhelming majority of respondents are Malaysian visitors, 98.2% (n=280), compared to 1.8% (n=5), who were international visitors from Indonesia (n=2), France (n=2), and Canada (n=1). In terms of age, more than half of respondents are between 24 and 30, accounting for 77.8% (n=222), followed by 12.3% (n=35) aged between 41 and 44. Other age groups include visitors aged 31-35 at 6.7% (n=19) and 36-40 at 3.2% (n=9). Concerning educational background, 39% (n=111) of visitors have a Bachelor's Degree, followed by around 33% (n=94) who have a diploma. High school graduates accounted for 11% (n=31), whereas Master's Degree holders accounted for around 8% (n=23). Roughly 3.5% (n=10) have A-level qualifications, 1.4% (n=4) have Doctoral Degrees, 0.3% (n=1) have O-Level and 3.8% (n=11) have other academic qualifications.

According to professional background, 41.4% (n=118) are students, 22.8% (n=65) are government servants, and around 20% (n=57) are private sector employees. Self-employed visitors accounted for around 7.4% (n=21), while unemployed visitors accounted for about 3.1% (n=9). Furthermore, business owners and other occupations have the same proportion at around 2.5% (n=7), whereas retirees account for only 0.3% (n=1). Salary information was also gathered to determine the range of monthly salaries for museum visitors. Of 285 respondents, 66% (n=188) earned MYR3000 or less. Based on the demographics, most respondents were between 24 and 30 years old, either in their studies or just starting to work. About 16.8% (n=48) of respondents earn between MYR3001 and MYR5000. Meanwhile, 10.2% (n=29) of respondents earn between MYR5001 and MYR10,000. Another income range is between MYR10,001 and MYR15,000, which accounted for 4.2% (n=12), followed by 1.4% (n=6) for both with a monthly salary between MYR15,001 to MYR20,000 and MYR20,001 or higher.

Types of Visits: This study, which focuses on the smart museum, also considers the types of visits to the museum to determine whether the respondents visit for the first time or make repeat visits. Figure 1 represents the proportions for both types of visits highlighted in this study.

Figure 1: Types of visit



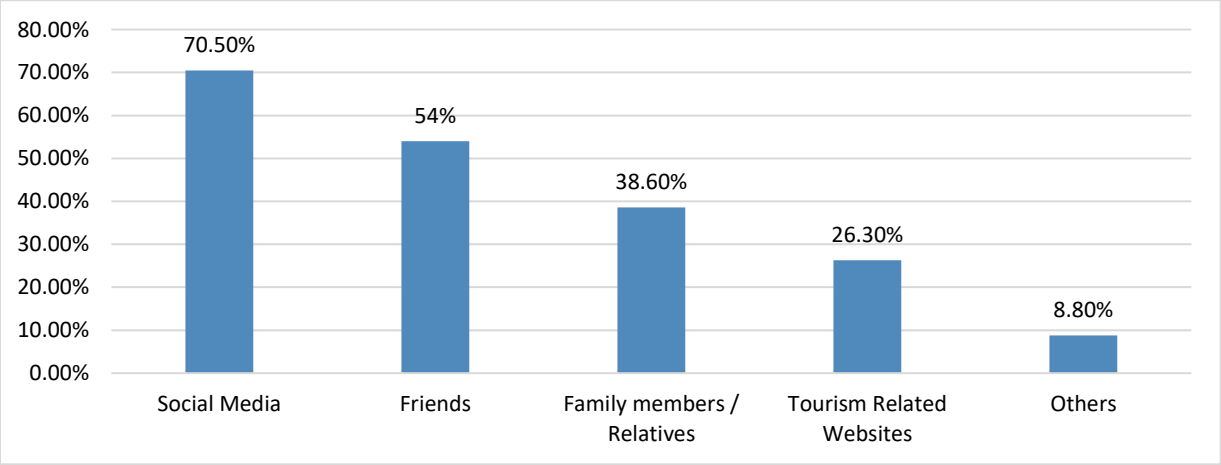
Source: Author's work

Undoubtedly, museums can attract first-time visitors based on their eagerness to enjoy cultural offerings in the museums. These people are referred to as explorers, whereby the visit is driven by curiosity, with a general interest to know more about the topics offered by the museum. They want interesting content that captures their attention and makes them learn (Cotter et al., 2021). Meanwhile, repeat visitors are favored because they do not cost much to be enticed to visit, compared to first-time tourists (Rasoolimanesh et.al., 2021; Abbasi et.al., 2021). Interestingly, the Borneo Culture Museum's visitors are almost evenly divided between first-time and repeat visitors. This study recorded 51.6% (n=147) first-time visitors and 48.4% (n=138) repeat visitors. Various reasons have been highlighted in the previous studies about the reasons to visit the same destination in the future. Vada et al. (2023) suggest that tourists are prone to come back to their well-known destinations for five reasons: (1) to lessen the possibility of meeting similar-minded people; (2) to raise the possibility of encountering similar-minded people; (3) they have become emotionally attached to the destination; (4) to get the experience the products offered by destination that were not visited in their previous trip; and (5) to show others to experiences that they had felt before. All of these factors must be carefully considered by museum management to attract more repeat visitors in the future.

In general, just like the other components of tourism products, museums rely on repeat customers to sustain the business. Culture and heritage tourism are addressed as dealing with intense competition (Deb, 2020) in today's business environment. In cultural heritage tourism, acquiring repeat customers is one of the most important long-term marketing goals, since it is the key to business survival and success (Cakici et al., 2019). According to a recent study (Zhou et al., 2023), memorable tourism experiences are the most powerful motivator for visitors to return to cultural and heritage monuments. As mentioned in the preceding section, smart museums engage visitors in their exhibitions through digitalization and other recent technologies. This recent approach can lead to an unforgettable museum experience that can generate repeat visitors. In the smart museum, technology plays a vital role in experience enrichment and motivates people to revisit (Chen et al., 2024; Yang et al., 2022). As for the visitors of the Borneo Culture Museum, the factor of technology implementation by the museum is assumed to be one of the reasons that drive the millennial market segment to return after their previous initial visit. Repeat visitors are undeniably vital for destination sustainability, and for Borneo Culture Museum, the success of attracting repeat visitors is an achievement that may inspire other museums, especially in Malaysia.

Sources of Information: A question on the source of information provides five answer options. Respondents are allowed to choose more than one answer to indicate how they know about the Borneo Culture Museum, Kuching, as shown in Figure 2 below:

Figure 2: Source of Information



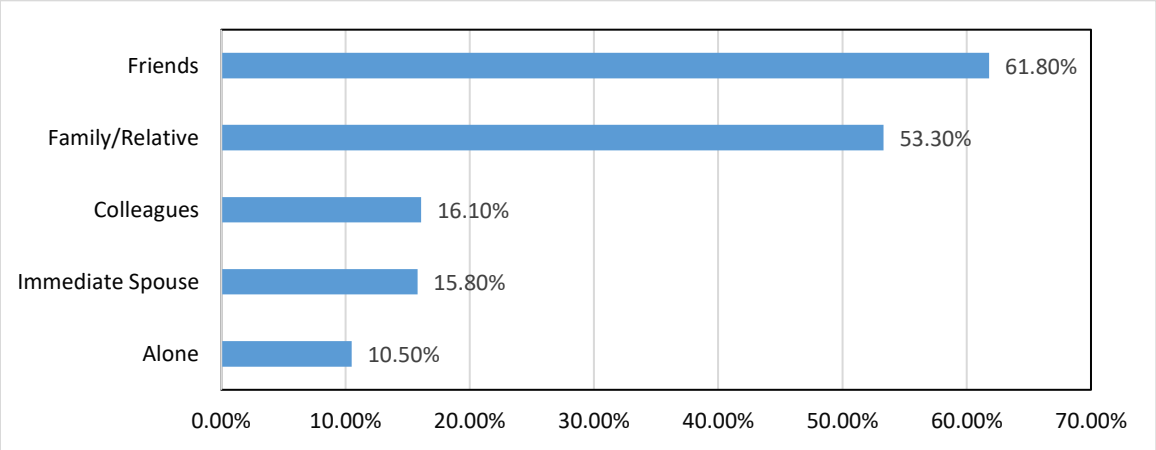
Source: Author's work

The main information source closely reflects the millennial generation, known as a tech-savvy generation, when 70.5% (n=201) disclose that information about the museum is gained from social media. Meanwhile, 54% (n=154) of visitors know about the museum from their friends, followed by the sum of 38.6% (n=110)

getting museum information from family members or relatives. Another 26.30% (n=75) utilize tourism-related websites. Meanwhile, 8.80% (n=25) gained information from other sources. Based on the result, the highest source of information that came from social media was possibly due to the Borneo Culture Museum's strategy to use social media actively, attesting to their success of getting 44,000 followers on Facebook and 5,500 followers on Instagram, as recorded in March 2025. As the tourism industry has experienced a significant shift in the way travellers, particularly the millennial generation, seek and consume information about travel destinations and attractions, the role of social media must be admitted as the means to reach millennial market segmentation (Kim et al., 2020b; Tan et al., 2021). The digital age has undoubtedly made social media the main platform that challenges the transformation of numerous industries, particularly tourism. Social media has become a powerful tool that aids the tourism industry, as it has unparalleled power to spread information, promote tourism spots, and influence travellers when they are making decisions about their tourism activities (Ketter, 2020). These shifts are highly abetted by Millennial travellers as they have taken social media as their primary source to acquire information and be inspired when making their travel plans. Millennials are also highly exposed to and utilize social media broadly. Millennials regard technology vastly and social media should be seen as a unique facet of this generation. Social media is considered to be a prominent source to help them choose their tourism destination, their means of transportation to the destination and places to stay (Tan et al., 2021).

Visit Companion: The travel companion plays a significant role in the tourism industry. A travel companion can significantly influence the overall experience of a trip, affecting everything from the enjoyment of the journey to the quality of memories created. A study found that an individual's travel mate can significantly impact tourist well-being and behavioral intentions (Vada et al., 2022). The question about Millennials' visit companion to the Borneo Culture Museum offers them the options of friends, family/relatives, colleagues, immediate spouse or travelling alone, and they are allowed to give more than one answer.

Figure 3: Visit Companion

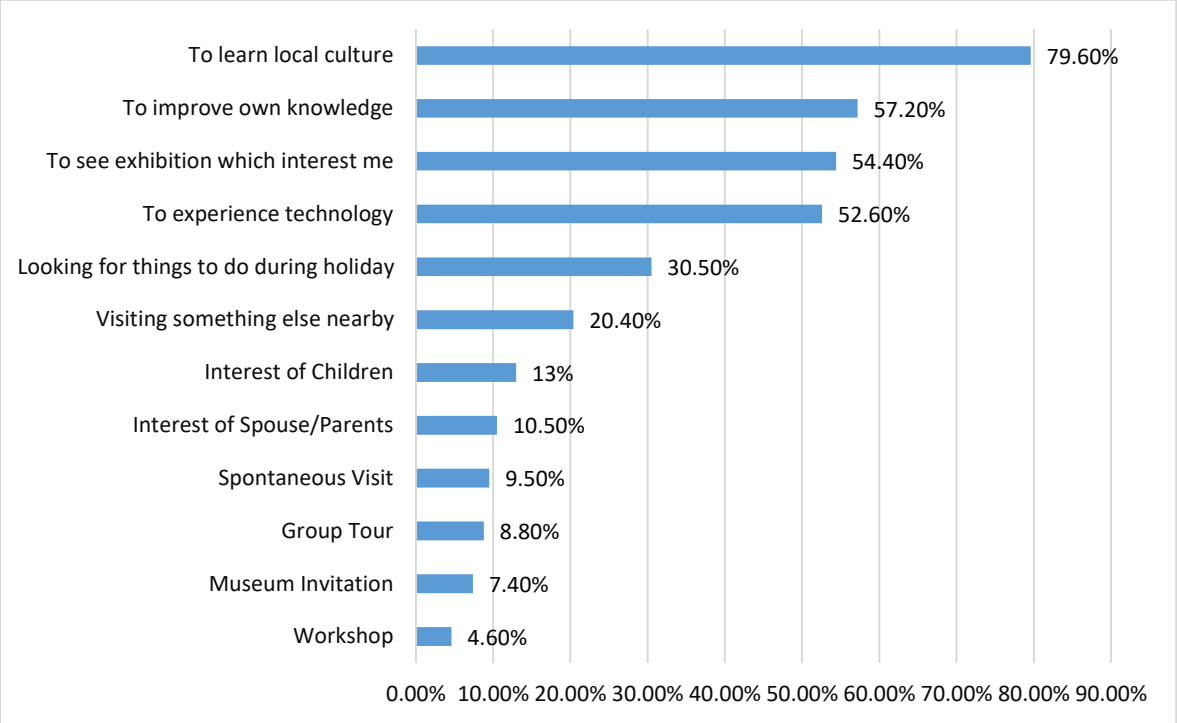


Source: Author's work

The millennial visitors to the Borneo Culture Museum recorded the largest proportion at around 61.8% (n=176) of those visiting with friends. Meanwhile, the second largest companion is family/relatives, which accounted for 53.3% (n=152). Travelling with colleagues represents the sum of 16.1% (n=46), followed by visitors with immediate spouses at about 5.8% (n=45) respondents. Finally, visitors who visited alone accounted for 10.5% (n=30). Research suggests that millennials value social relationships and group experiences during their travels. A study in another country, such as India, by Yousaf et al (2021) suggests that one of the seven travel motivations for Indian millennials is "social relationships". This indicates the significance of companionship in their travel decisions. Congruently, the findings of Chen et al (2020) identify "play in the group" as one of the three main motivation types for Chinese millennials, emphasizing the importance of sociability as a factor influencing travel satisfaction. This finding shows the need for museum management to provide activities that are suitable for those visiting with companions, whether friends, family, or others, by offering a range of services and features that cater to groups and make the experience more social, comfortable, and engaging.

Motivations of Visit: The question about the motivation for the visit includes twelve reasons whereby the respondents may select more than one answer. This motivation consists of cultural interest, knowledge as a pull factor, own or other dependents' interest, curiosity about the technology usage in the museum, as part of a holiday or group tour activity, spontaneous visit, visit while attending a workshop at the museum or fulfilling a museum invitation. Figure 4 shows the motivations of visits from the largest to the smallest proportion.

Figure 4: Motivation of Visit



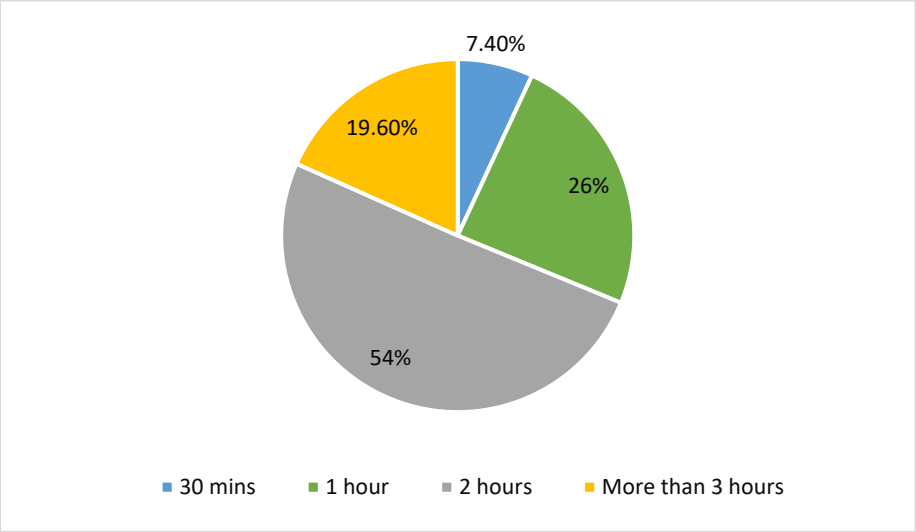
Source: Author's work

The drive to learn about local culture accounts for the highest percentage, around 79.6% (n=227), followed by the desire to increase one's knowledge, which accounts for 57.2% (n=163). These two reasons are consistent with the functions of the museum as defined by ICOM (2022). Previous research has shown that millennials are the most regular visitors to cultural hubs like museums and concert halls, with a high lifetime value and devoted audiences. The drive to learn about local culture accounts for the highest percentage, around 79.6% (n=227), followed by the desire to increase one's knowledge, which accounts for 57.2% (n=163). These two explanations are consistent with the functions of museums as defined by ICOM (2022). Previous research has shown that millennials are the most regular visitors to cultural hubs like museums and concert halls, with a high lifetime value and devoted audiences (Kim et al., 2020a).

The next reason for the visit is to see an exhibition that interests them, which accounts for around 54.4% (n=155). In terms of technology-related motivation, 52.6% (n=150) of respondents visited the Borneo Culture Museum to experience the technology deployed by the museum. Aside from that, approximately 30.5% (n=87) have included museum visits as part of their vacation activities. In addition, 20.4% (n=58) went to the Borneo Culture Museum after visiting other nearby local attractions. Visiting the museum for the interest of children accounted for 13% (n=37), while spouses/parents accounted for 10.5% (n=30). Visitors pay a spontaneous visit at around 9.5% (n=27), as part of a group tour at about 8.8% (n=25), fulfill museum invitation at about 7.4% (n=21) and visit while attending a workshop at the museum at about 4.6% (n=13). The findings suggest that the top five motivations for visiting the Borneo Culture Museum include the desire to experience the museum technologies. This includes games and interactive activities, an interactive exhibition panel, audio-visual technology, interactive touchscreen exhibits and a virtual reality experience. This smart museum approach resulted in a different and unique museum experience, which was then shared on social media soon after their visit.

Duration of the Visit: Previous scholars suggest that the length of stay at a cultural site is considered a satisfaction indicator. The longer time people spend in a museum indicates the more they benefit from the visit, contradicting those who spend a shorter time. The question about the duration of the visit aimed to gather accurate time spent inside the museum (exhibition galleries). This particularly refers to the time allocated to engage with the exhibition, such as participating in the activities available and using the technological elements offered by the Borneo Culture Museum. The time proportion is divided into four: 30 minutes, 1 hour, 2 hours, or more than 3 hours.

Figure 5: Duration of the Visit



Source: Author's work

More than half of the Millennial respondents of the Borneo Culture Museum (54%, n=154) spent 2 hours inside the museum, whereas the second highest percentage (26%, n=74) spent one hour. Approximately 19.6% (n=56) of respondents spent more than 3 hours, whereas 7.4% (n=21) barely spent 30 minutes at the museum. The duration of two hours is significantly longer than the length of stay in any other museum as a study in the Art Museum in Finland discovered a single visit to the museum is short, as 89,32% of the respondents estimated that they spend less than two hours on a single visit (Jääskeläinen, n.d.). However, the amount of time spent in the museum varies depending on whether the visitors came to see only a single exhibition or the entire museum. The Borneo Culture Museum's two-hour duration demonstrates the growing interest of millennial visitors in the exhibition and activities offered by the museum management. Furthermore, the use of technology to enhance the museum experience lengthened the visit. Previous research revealed that technology can drive millennials to visit museums (Kumraksa et al., 2024). This technology-related factor is relevant to the Borneo Culture Museum since they are utilizing different elements of technology to showcase their exhibits, and technology is unquestionably regarded as a millennial's passion.

Technology and Satisfaction: Finally, to investigate the roles of technology towards millennial visitors' satisfaction, the simple linear regression was used to test the following hypotheses:

$\mathbf{H_0}$: Technology has no significant effect on the overall satisfaction of smart museum visitors
$\mathbf{H_1}$: Technology positively affects the satisfaction of smart museum visitors.

The Influence of Technology on the Satisfaction

Table 1 shows the model summary with a produced R-value of 0.802, indicating a strong positive correlation between technology and satisfaction. The R^2 value of 0.642 suggests that 64.2% of the variance in visitor satisfaction can be explained by the level of technology in the museum. The Adjusted R^2 value (0.641) is close to R^2, confirming the model's stability.

Table 1: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.802[a]	.642	.641	.42723

a. Predictors: (Constant), Technology

b. Dependent Variable: Satisfaction

Table 2 shows ANOVA results indicate that the regression model is statistically significant ($F(1,283) = 508.410$, $p < 0.001$). This confirms that technology significantly contributes to predicting satisfaction.

Table 2: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	92.798	1	92.798	508.410	<.001[b]
	Residual	51.655	283	.183		
	Total	144.453	284			

a. Dependent Variable: Satisfaction

b. Predictors: (Constant), Technology

Linear regression analysis presented in Table 3 examines the impact of technology on the satisfaction of smart museum visitors. The unstandardized coefficient ($B = 0.759$, $p < 0.001$) suggests that for every one-unit increase in technology, visitor satisfaction increases by 0.759 units. The standardized beta coefficient ($\beta = 0.802$, $p < 0.001$) further reinforces the strong effect of technology on satisfaction.

Table 3: Linear Regression Analysis between Technology and Satisfaction

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.189	.144		8.285	<.001
	Technology	.759	.034	.802	22.548	<.001

a. Dependent Variable: Satisfaction

Based on the above analysis, the null hypothesis was rejected. Technology is significantly affecting the satisfaction of the millennial visitors of the Borneo Culture Museum. This finding is in congruence with previous studies highlighting the important role of technology in producing satisfied museum visitors.

5. Conclusion and Recommendations

It is projected that the Millennial generation will represent 75% of the global workforce by 2025. Thus, Millennials will be the most important market segment that will shape the tourism industry worldwide. Realizing their potential to help sustain culture and heritage tourism, this study provides an initial Millennial visitor's profile. The focus had been given to the smart museum due to the post-pandemic paradigm that has witnessed the usage of technologies emerging in the tourism business, just like other sectors in the business landscape. This study focuses on the millennial visitors of smart museums, specifically on the Borneo Culture Museum in Kuching, Sarawak. This museum houses an exhibition of Sarawak's rich culture and heritage, which was chosen as it is the largest in Malaysia and the second largest in Southeast Asia. In addition, the technology usage in this museum is well ahead as compared to other government and state-funded museums in Malaysia at the moment. It leaves the visitors amazed and changes their perception of the museum visitation experience. In addition, due to Millennials being well known as a technology-savvy generation and using technology heavily in almost every aspect of their lives, the findings from this study can be used by the Museum administration to better understand the millennial market.

In this study, the profile of the millennial visitors is divided into their demographic, types of visits, sources of information, visit companion, motivation and duration of the visit. The important finding of the study discovered social media as the main source of information among millennials. Social media has proven to be the most powerful medium to approach the millennial market and plays a significant role in how millennials experience and share cultural content. They often seek shareable and worthy moments during museum visits, which can boost visibility and engagement for the museum. Hence, museums should design exhibits and experiences with an eye toward social media that can result in positive electronic word of mouth among millennial visitors.

In addition, technology was found among the top five reasons to visit the Borneo Culture Museum, which is aligned with the previous research that found integrating technology and innovations in museums is a crucial approach to 21st-century museum development and to attract the millennial generation to visit the museums. This finding should be paid attention to by other museums that still use the conventional method of displaying the exhibits. Undeniably, the growing importance of technology, interactivity, and personalization in creating meaningful museum experiences for the millennial market needs the museums to adapt by integrating modern technologies, offering engaging and flexible experiences and ensuring accessibility and inclusivity. By aligning with millennials' values and expectations, museums can cultivate a strong and sustainable connection with key audiences, ultimately driving engagement, loyalty and cultural enrichment.

Since the technology application at the museum in Malaysia is still in the infancy stage, as other museums in Malaysia are reportedly in the process of technology installation, this study was conducted in a case study method. While the study on millennial visitors' profiles provides valuable insights, several factors limit its generalizability across different types of museums and populations. As the respondents are millennial visitors, the result of this study does not represent other generational cohorts of visitors. In addition, the result also cannot be generalized to other museum types such as private museums and personally funded museums. However, once the smart technology usage in Malaysia's museums becomes more mature, future study is suggested by sampling visitors from several museums and including private and personally funded museums. Other than that, the future study can be extended to the visitors' acceptance of smart technology in the museum setting using related theories such as TAM and UTAUT. Finally, future researchers might also be interested in exploring from the museum staff's perspective on their readiness towards technology implementation at the museum as they will be the person responsible for assisting the visitors in using the latest technologies that the museum will provide, thus helping in gaining the expected memorable visit experience.

In conclusion, understanding the profile of millennial museum visitors is essential for museums striving to remain relevant and engaging in today's rapidly changing cultural landscape. As museums adapt to the evolving preferences of millennials, they not only enhance the visitor experience but also secure their place as essential institutions for learning and community engagement. By fostering a culture of innovation and collaboration, museums can navigate future challenges while cultivating a new generation of passionate and informed visitors. In doing so, they will continue to serve as vital platforms for cultural exchange and social connection, ensuring their relevance in an ever-changing world.

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