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Effect of Immersive Experience on Repurchase Intention of Virtual Heritage Tours among Gen-Z in Indonesia

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Abstract. This study aimed to examine the impact of immersive experiences on Gen-Z in Indonesia and their repurchase intention of virtual heritage tours. Based on a recent suggestion to explore the effects of Mixed Reality on visitor experience, an e-questionnaire was distributed digitally through platforms such as WhatsApp, Instagram, Facebook, and TikTok. Convenience sampling method was used to collect data from 128 respondents. The findings indicated that Gen-Z in Indonesia expressed an intention to repurchase virtual heritage tours after experiencing at least one high-quality tour. The quality of the virtual heritage tour was determined by its ability to create a virtual environment that mimics a real environment and stimulates users' physical senses, as well as the quality of its content. These two factors were found to be the most significant indicators of a successful virtual heritage tour. The findings have practical implications for heritage management, including the use of immersive technology as an alternative way for users to experience heritage sites and to mitigate overtourism. Additionally, this study contributes to the fields of Information and Communication Technology and Tourism, specifically virtual tours and Indonesia. Further research may investigate other factors that may influence Gen-Z's repurchase intention of virtual heritage tours.

1 Introduction

The latest advancement of information and communication technology (ICT) has taken global societies to a new level. Gradually, global societies have been shifting their ways of communicating and exchanging information from using relatively conventional tools, such as landline telephones and printed mass media, to the latest digital devices and information technology, such as smart mobile phones and the internet. The outbreak of Covid-19 pandemic, which began in early 2020, has accelerated the advancement and utilization of ICT, such as Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR) that combines VR and AR, and, recently, Extended Reality (XR) – all these technologies are termed 'immersive technology'. This immersive technology has been diffusing into many aspects of society living, such as entertainment and education to name a few, creating what is known as 'immersive experience' for its users. It is predicted that in the near future, and as a continuum of this immersive technology progress, global societies will begin to adopt and utilize Metaverse, which is defined as "parallel, virtual universe that uses ambient intelligence to enhance physical spaces, products and services, which emerges as a collective, virtual shared space of value cocreation" [1]. As previously indicated, Metaverse is one step ahead of immersive technology, which provides users

with a seemingly real environment (such as hologram) through utilization of particular devices.

The expansive and severe impacts of the Covid-19 pandemic on the global tourism industry have enforced some tours and travel companies as well as destination management organizations to use immersive technology to help survive the crises [2, 3]. For example, some travel and tourism-related institutions have organized virtual tours and augmented tours to provide users with an alternative way to experience a tourist attraction or destination. By joining a virtual tour or augmented tour, users can experience a tourist attraction or destination or event from their home or any place where they are based in. Such method generates some benefits for both the demand and supply sides of the tourism industry. From the demand side, potential consumers or tourists can try experiencing a tourist attraction or destination or event without having to be physically present at the attraction or destination or event [4, 5], and spending a higher cost they would on a real trip. From the supply side, the tourism industry can still make some profit through providing services to meet this consumers' need on a lower cost. In addition, many travel and tourism institutions – be it private or public – have used immersive technology as a promotional tool. Through these efforts, the travel and tourism industries hope they can instill an image of a tourist attraction or destination or event in consumers' minds, in hope that consumers will become or continue to be aware of the tourist

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attraction or destination or event, and will visit it when the situation is more conducive than that in the pandemic. During the first two years of the Covid-19 pandemic outbreak, immersive technology has become a breakthrough and been increasingly permeating the tourism industry worldwide – whether it has been used commercially or non-commercially [6].

With the expanding utilization of immersive technology, it is predicted that users' demand for immersive experience in the tourism industry will increase in the near future. However, it is still difficult to forecast to what extent this immersive technology will be able to substitute a tourist's real experience with visiting a tourist attraction or destination or event [7]; [8]. One of the main reasons is because tourists seek experiences – specifically they seek firsthand experiences by being physically present at a tourist attraction or destination or event. Furthermore, for developing economies, particularly those that depend heavily on incomes from tourism, a concerning reason is that immersive technology could constitute a threat on the revenues generated by the tourism industry [4]. These concerns spark a debate whether the global tourism industry is willing to adopt immersive technology as 'a new normal'. On the other side, support for the application of immersive technology has been expressed by some parties, that bases their reason mainly on the potential of immersive technology to help mitigate impacts of overtourism, as occurs in many destinations and countries today. This notion also is true when applied to protected sites and areas, either natural or cultural, that attract visitors, where it is crucial to limit the number of visitors to avoid overcapacity that can affect the sustainability of the sites and the areas. Thus, protected areas, tourist destinations, and tour operators can apply immersive technology as an alternative way for visitors to enjoy while protecting these attractions and destinations.

As we project that immersive technology, and eventually Metaverse, will become a tool that can be utilized in the tourism industry in the future, it is also important to examine how the future users of this technology perceive it. In their recent qualitative study involving respondents from some Asian countries, [1] found that Gen Z will favor immersive technology. As a generation cohort, Gen Z is considered to be more digital savvy compared to their previous generations, including Gen Y (Millennials), Gen X, and Baby Boomers. Gen-Z, that consists of people who were born between mid-1990s and early 2010s, grew up in the era of digital technology. Thus, these so-called 'digital natives' can be regarded as the first generation throughout the human history who were born and raised and grow up in the digital technology era.

Since immersive technology is currently still at its infancy, particularly in Indonesia, little is known about Gen Z's attitudes toward immersive products after experiencing them. Even though some tours and travel and tourism institutions have organized virtual tours and other kinds of digital-based tours for the community at large during the pandemic, it will be intriguing to know whether Gen Z – specifically – favored the immersive experiences gained through their consumption of

immersive products. As previously indicated, [1] were among the earliest scholars who studied the future of MR in cultural heritage tourism, involving Gen-Z as respondents in their qualitative study. One of their findings was that Gen-Z believed they can benefit from cultural heritage experiences through the use of MR, and that Metaverse will support them in cocreating transformational experiences. Thus, Buhalis and Karatay recommended that future studies should be conducted to examine effects of MR on visitor experience, particularly Gen Z.

1.1 Objectives

This study was aimed at investigating whether Gen Z, specifically in Indonesia, is interested in repurchasing a heritage-themed virtual tour or other kinds of heritage-themed immersive products after they experienced one. One main consideration to conduct this study was based on a premise that tourists would seek real and firsthand experiences at a tourist site or destination. Thus, it became a question whether immersive products can substitute a tourist's real experience in a tourist attraction or destination, which could discourage users from buying other immersive products on the next occasions.

2 Literature Review

Virtual experience is defined as an experience that is gained in a virtual environment through the use of a mediated environment created by a computer and based on a 'telepresence' concept [9]. [10] defined telepresence as "the sense of being" in an environment that is mediated by communication media. What's more, telepresence is seen as a phenomenon where media users are seemingly not aware of the existence of a physical environment, and that users feel as if they stay in a virtual environment [9, 11].

Virtual experiences are gained through the use of a simulation environment or virtual environment, similar to those that use sketches, photographs, and videos, because they are considered effective in communicating an image of a tourist destination [9, 12, 13]. Such simulation environment or virtual environment can be created through technologies, such as VR, AR, MR, and XR, also known as immersive technology. According to [14], immersive experiences are the experiences gained through simultaneous interactions between users and real environment and virtual environment, by integrating virtual contents with physical (real) environment to produce users' perceptions. Such perceptions are gained from virtual environments, such as in the forms of pictures, voices, or other stimulations that form them.

A number of studies revealed that the more human's senses are involved in a virtual environment, the more immersive experiences they gain, creating a virtual environment in which users can feel as if they were in a real world [15-18]. Therefore, it can be suggested that immersive experiences are outputs of virtual experiences, that are created when people are in a virtual

environment but feel as if they were in a real environment. The more actual a user feels from a virtual experience, the more immersive experience is gained from such virtual experience. However, not all virtual experiences can give users immersive experiences.

One benefit of immersive technology application is that it can increase the competitive advantage of a tourist destination due to their ability to compete in the Tourism 4.0 era. In this era, such advantage can only be gained by utilizing ICT along with all the existing technologies to provide visitors at a tourist destination with immersive experiences [19, 20, 17]. In relation to that, a lot of destination management organizations have substantially invested in the creation of VR, which is considered as a new effective tool to market a tourist destination [9]. Virtual tours have become one of the applications of VR technology. For example, Sensorama is an early immersive multi-sensory experience that allows humans to ride a virtual bike through Brooklyn [21]. By allowing users to make trips in a simulation environment, virtual tours give humans chances of visiting distant places, both in the physical and time spaces [22].

VR technology is used to create a condition where users are in a virtual environment and they feel as if the environment was real. An effective VR application should be able to condition users' feelings as if they were in real locations [17, 23, 24, 25]. Because of this characteristic, VR application can be tremendously useful to promote a tourist destination because a tourism product basically is produced for tourists to seek new experiences and/or new places [17, 9, 26]. However, as time progresses, virtual tours not only can be organized through the utilization of VR technology but also through the other kinds, such as AR, MR, and XR. All these technologies are called immersive technology that can expand the reality users experience by combining virtual and real worlds, and they can even create a whole virtual experience. So, VR, AR, MR, and XR come under the same platform, with each having a different level of immersive experience.

As aforementioned, this study attempted to see the relationship between Gen-Z's post-purchase of heritage-themed immersive experiences and their intentions to repurchase the same product in the future. Repurchase intention, within the context of tourist destination marketing, is part of a study about consumer behavior. According to [27], consumer behavior is a collection of actions that represents a consumer's process in consuming a product (also termed 'customer journey'), from pre-purchase, during purchase, and post-purchase. Repurchase intention is part of a post-purchase behavior that depicts an individual's loyalty after he or she purchases or consumes a product.

Repurchase intention is defined as "an individual's judgment on buying a designated service from the same company again, taking into account his or her current situation and likely circumstances" [28]. Repurchase intention is formed only when a positive experience is created in a consumer's mind and there was an expectation for benefits before purchase [29]. Thus, repurchase intention derives from loyalty that is closely

related to customers' satisfaction and expectation to purchase more products [29, 30, 31].

Social psychological theories about attitudes and behaviors were rarely focused on repurchase intention [29]. Most studies about repurchase intention are not holistic, with the affecting factors made complicated [29, 32, 28]. Meanwhile, research into virtual tours, including immersive experience, has never been conducted. Therefore, this study was intended to investigate how immersive experiences influence repurchase intention of a virtual heritage tour, specifically among Gen Z in Indonesia.

Many studies show that repurchase intention is influenced by previous consumption experiences. The better experiences a product gives, the better chances of repurchase intention are. However, empirical research into influence of virtual experiences and immersive experiences on repurchase intention of a heritage-themed virtual tour has not yet been conducted. Existing research only studied the influence of virtual experiences in general on behavioral intention. A study by [33], for example, showed that post-purchase behavior is influenced by the quality of virtual experiences. A study by [34] showed that tourists' experiences of a virtual tour significantly influence their repurchase intentions. Meanwhile, another study by [35] showed that a virtual tour experience can influence a tourist advocacy behavior. If using a deductive logic, it can be temporarily concluded that these studies can provide foundations about the influence of immersive experience on repurchase intention, which become a hypothesis that is used in this study:

H1: Immersive experiences positively influence repurchase of virtual heritage tours

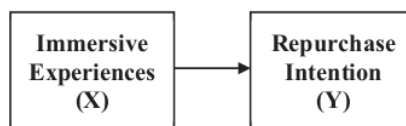


Fig. 1. Conceptual Framework

[17] conveyed that virtual experiences can generate the immersive experiences gained through interactions of all humans' physical senses by using devices that generate a virtual environment condition. Meanwhile, [33] said that immersive experiences are gained through measuring quality of virtual experiences with several measurement dimensions, including content quality, system quality, vividness, attitude, and telepresence.

3 Methods

This study investigated the effect of immersive experience among Gen-Z in Indonesia on their repurchase intention of virtual heritage tours on future occasions. Gen-Z was chosen for this study primarily because members of this generation are considered as 'digital natives', in that they were born and raised in the era where information and communication technology (ICT) was progressing rapidly. According to [36], most

members of Gen-Z are more ‘digital savvy’ than any other previous generation cohorts, including Baby Boomers (people born between 1946 and 1965); Gen-X (born between 1966 and 1980); and Gen-Y (born between 1981 and 1994). Furthermore, Lissitsa and Kol said, “This market segment includes the most educated, mobile, and connected consumers to date. They are also socially conscious, tech-savvy, quite innovative, and permanently looking for change, with an innate comfort in the virtual world. For these consumers, the Internet has always existed. Most Gen Zers are continuously connected through smartphones and tablets, and have access to more information than any other generational cohorts”. In addition, Gen-Z will soon enter productive ages, which means they will form a new potential tourist market in the tourism industry. Thus, Gen Z will mostly determine the trend in the future tourism industry. This study will generate some information on Gen-Z’s attitudes and behaviors toward immersive technology in Indonesia. Findings of this study specifically will help the travel and tourism industries plan, determine, and decide what immersive products to produce to meet the new tourist market’s needs and wants in the near future.

As the theme of the study suggests, the population of this study is Gen-Z in Indonesia. However, the population size could not be determined as there was still a lack of information on the total number of Gen-Z members in Indonesia who had experienced virtual tours, more particularly of heritage sites or destinations or events. Because the population is infinite at the moment, the sampling technique used was convenience sampling. Thus, a convenience sample size of as many as 100 was determined for this study.

4 Data Collection

To collect data, e-questionnaires were designed using indicators determined from each variable. The following variable operationalization was developed based on a study by [16], which then transformed into statements that built the questionnaire.

Table 1. Variable operationalization

Variables	Dimensions	Statements
Immersive Virtual Tour Experiences	Content Quality	<ol style="list-style-type: none"> 1. Virtual Tour (VT)/Augmented Tour (AT) has given me a general idea of the cultural and heritage destination 2. VT/AT has given me information on cultural and heritage destinations that are relevant with my future travel plan 3. VT/AT helps me plan my future trip to cultural and heritage destinations

System Quality	<ol style="list-style-type: none"> 1. The VT/AT of a cultural and heritage destination I experienced was easy to maneuver or navigate on screen 2. The quality of visualization of the VT/AT (interface) of a cultural and heritage destination I experienced was good (easy to use) 3. The VT/AT of a cultural and heritage destination I experienced could respond to my need as a user and/or my need to interact with other users (interactive)
Vividness	<ol style="list-style-type: none"> 1. The imagery of a cultural and heritage destination in the VT/AT I experienced was visible 2. The imagery of a cultural and heritage destination in the VT/AT I experienced was colorful 3. The imagery of a cultural and heritage destination in the VT/AT I experienced was clear 4. The imagery of a cultural and heritage destination in the VT/AT I experienced was sharp 5. The imagery of a cultural and heritage destination in the VT/AT I experienced was bright 6. The imagery of a cultural and heritage destination in the VT/AT I

		experienced was good
	Telepresence	<ol style="list-style-type: none"> 1. The VT/AT made me feel as if I were in the cultural and heritage destination 2. I want to have as real experience as possible, as if I did real activities, through VT/AT 3. VT/AT will complement the real trip
	Attitude Toward the Virtual Tour Device	<ol style="list-style-type: none"> 1. My assessment of the VT/AT I experienced Very bad (1) through Very good (5) Very negative (1) through Very positive (5) Highly dislike it (1) through Highly like it (5)
Virtual Tour Repurchase Intention		<ol style="list-style-type: none"> 1. I will consider booking a VT/AT of a cultural and heritage destination in the future 2. I will do my best to book a VT/AT of a cultural and heritage destination in the future 3. I plan to book a VT/AT of a cultural and heritage destination often

A Likert's scale was used for respondents to scale the statements that closely represent their attitudes toward their virtual heritage tour experiences, ranging from 5 as Highly Agree; 4 as Agree; 3 as Average; 2 as Disagree; and 1 as Highly Disagree. The questionnaire was put into a Google Form and distributed through researchers' own Tourism-related WhatsApp groups and social media, including Facebook, Instagram stories, and TikTok. The e-questionnaire was distributed from April 9 through 17, 2022, and was intended to be filled out by any Indonesian citizen born between 1996 and 2010 who currently lives within the Republic of Indonesia territory. In addition to the aforementioned criteria set for the population, respondents also should have experienced joining in at least one virtual heritage tour or another kind of heritage-themed digital-based tour. The theme 'heritage' was confined to any natural or cultural heritage site, such as national parks and cultural heritage sites, situated within the Republic of

Indonesia territory. Using a convenience sampling technique, a total of 341 filled out questionnaires were gained. However, only 128 of that total number were considered complete and valid. The data were then processed using SPSS, as presented in the Findings and Discussion below.

5 Results and Discussion

5.1 Numerical Results

A simple linear regression was used in this study. By using SPSS, several outputs were generated, including Analysis of Variance, Regression Coefficient, and Model Summary as presented in the following tables.

Table 2. Analysis of variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	433.854	1	433.854	98.123	.000 ^b
	Residual	557.114	126	4.422		
	Total	990.969	127			

- a. Dependent Variable: Repurchase Intention
- b. Predictors: (Constant), Immersive Experience

Table 2. Analysis of Variance shows a significant level or linearity of regression between the variables of immersive experience and repurchase intention of virtual heritage tour, where a significant value of 0.000 was generated and that means < significance criteria (0.05). Therefore, a regression equation model between the variables of immersive experience and repurchase intention of virtual heritage tour is significant, in that the linear regression model meets the linearity criterion. In other words, immersive experience is in line with repurchase intention of virtual heritage tour. This means, the better immersive experience is, the more possible it is for repurchase intention of virtual heritage tour to occur. Table 3. Regression Coefficient below shows functional relation between the variables immersive experience and repurchase intention of virtual heritage tour.

Table 3. Regression coefficient

Model		Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	-.870	1.186		-.734	.464
	Immersive Experience	.159	.016	.662	9.906	.000

- a. Dependent Variable: Repurchase Intention

Table 3. shows the regression equation model obtained along with the constant coefficient and variable coefficient presented in the Unstandardized Coefficient

B column. Based on this table, a regression equation model: $Y = -0.870 + 0.159 X_1$ was generated. From this equation, for every increase of 1 on immersive experience there will be an increase in repurchase of heritage VT for as many as 0.159 unit. Or, based on the Standardized Coefficient Beta column, a coefficient value of 0.662 is generated. Also, based on this table, there is the t-value of 9.906 with a significance of 0.000 or $p < 0.05$. Thus, this generates a significant testing which leads to rejection of H_0 . This means immersive experience affects significantly on repurchase intention of virtual heritage tour. The significance of effect of immersive experience on repurchase intention of virtual heritage tour is presented in the following Table 4.

Table 4. Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.662 ^a	.438	.433	2.10275

a. Predictors: (Constant), Immersive Experience

Table 4. informs that correlation coefficient between immersive experience and repurchase intention of virtual heritage tour is 0,062, or beyond the category of 'fairly strong' [37]. Through this table, the r squared value or determinant coefficient also is generated, showing how good a regression model formed by interaction between immersive experience and repurchase intention of virtual heritage tour is. The coefficient value obtained is 0.438, which can be implied that immersive experience variable has an effect or contribution of 43.8% on repurchase intention of virtual heritage tour, and that the other 56.2% is affected by other factors beyond immersive experience.

This study theoretically and empirically generates and tests the relationship between immersive experience and repurchase intention of virtual heritage tour among Gen-Z in Indonesia. Perhaps the most important finding of this study is the information on the effect of Gen-Z's immersive experience on their repurchase intention of virtual heritage tour. We found that Gen-Z in this study decide to repurchase a virtual heritage tour in the future after experiencing a VT that was able to present a virtual environment, stimulating their physical senses as if they consumed a real virtual heritage tour or as if they were in a real environment.

This study also found that immersive experience was created through the quality of virtual environment conditioned by virtual heritage tour providers. In other words, the better quality a VT environment is, the higher chance of a user's immersive experience will be. Also, the more immersive a virtual heritage tour is, the higher chance it will be able to substitute a real heritage tour. The quality of a virtual environment found in this study was a consequence of cocreation between virtual heritage tour and the users, followed by the quality of a virtual environment content. Therefore, findings of this study support those of previous ones, such as that conducted by [33] who suggested that the quality of a virtual environment can affect consumers' behavioral

tendencies. Aside from that, this study also supports that of [1]

, who suggested that Gen-Z believes that immersive products, such as virtual heritage tours, can substitute their real heritage tour experience.

Through the statistic testing, it was shown that immersive experience significantly is an important variable that is able to predict repurchase intention of virtual heritage tour among Gen-Z. The finding of this study solidifies the importance of immersive experience in increasing the competitive advantage of a tourist destination, where it can only be achieved by utilizing ICT and all the existing technologies for visitors to utilize in a tourist destination [19, 20, 17].

Findings of this study provide a practical implication to heritage destination managements and service providers of virtual heritage tours if they intend to increase customers' loyalty by providing and facilitating virtual environments, either *in situ* or off site, by utilizing immersive technologies, including VR, AR, MR, and XR. Aside from that, it can be suggested that heritage destination managements and service providers of virtual heritage tours can continuously and consistently make engagements with their customers to build cocreations that can enhance immersive experience.

6 Conclusion

Findings of this study suggest that Gen-Z in Indonesia had a positive impression of the immersive experiences they gained from participating in virtual heritage tours on past occasions. In other words, findings of this study support the notion that Gen-Z's positive experiences with immersive products affect their intentions to repurchase other immersive products on future occasions. Findings also indicate that the good quality of an immersive product became a crucial factor in its production. These findings can be used by tourism stakeholders to plan for and to make decisions regarding future applications of VTs or other digital-based tours that cater to a specific target market, specifically Gen-Z in Indonesia. Heritage managements also can use these findings to solve cases that are related to carrying capacity at protected areas, such as using VTs as an alternative way for visitors to experience natural or cultural heritage sites, as well as to provide a promotional tool for their heritage sites as an alternative way to help prevent or solve overtourism at protected natural and cultural heritage areas.

Overall, findings of this study contribute to the knowledge in the fields of ICT and Tourism, particularly concerning Gen-Z's attitudes and behaviors toward repurchase intentions of immersive experiences within the context of Indonesia. While Buhalis and Karatay's study was among the earliest ones in the fields, theirs emphasized specifically on MR and on the context of Asia in general. The contexts of VR as an immersive product and Gen-Z in Indonesia as the study sample provide a new insight to both the ICT and Tourism fields, which became a novelty of this study.

The current lack of information on the study population size, which affected the number of the study sample, became one of the limitations of this study. Thus, the convenience sample size may not reflect the true condition of how Gen-Z in Indonesia perceives their previous experiences with virtual heritage tours and their repurchase intention of the same products in the future. In addition, this study examined Gen-Z's experiences with virtual heritage tours during the Covid-19 pandemic, where most people underwent mobility restrictions. Thus, VTs became one of a few 'traveling' options during the restrictions, which could enhance the capacity of VTs as a tourism product to the users. Consequently, it would be interesting to know if different findings will be generated when the study is applied to the 'post-pandemic' context, where people have more opportunities to travel directly to heritage sites or destinations or events and VTs are not among a few 'traveling' options anymore.

Further study can be conducted to investigate what other factors aside from immersive experience that can affect repurchase intention of virtual heritage tour among users, particularly Gen-Z in Indonesia. It also can investigate which dimension of the immersive experience variable that can mostly influence users' repurchase intentions. In addition, future study also can be conducted to explore the benefits, as well as disadvantages, of immersive technology to Gen-Z in Indonesia. To overcome the limitations in future studies, a pre-survey of the number of Gen-Z members who have experienced VTs or other forms of immersive technology – more particularly of heritage-themed ones – can be undertaken to generate a more representational sample size. All these future studies certainly are aimed at generating knowledge that can benefit both the VT users and service providers in Indonesia, particularly with the oncoming Metaverse era.

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