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The Roles of Digital Exhibition in Enhancing Immersive Experience and Purchase Intention

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A B S T R A C T

Museums in modern society serve to a broader public than their early predecessors. In response to such transition, many art museums now open digital exhibitions to provide immersive experience and maximize user interaction. This study aims to find facilitators of mass popularity in the field of art by identifying the effect of specific features of digital exhibitions – animated image and storytelling description – on museum visitors' immersive experience and willingness-to-pay price premium (WTP). By performing an online-based two (art types: still image vs. animated image) by two (description types: informative description vs. storytelling description) experiment, we find that animated images and storytelling description enhance experiential value and imagery vividness, the two aspects of immersion, and WTP. Furthermore, the impact of digital exhibition on visitors' immersive experience and WTP is stronger when animated images and storytelling description are adopted together. This paper contributes to both IS literature and museum industry by identifying specific features and mechanism of digital exhibition that could enhance visitors' immersive art experience. By studying digital exhibition, which is not bound by physicality of artwork and exhibition space, this study also offers an empirical insight that advocate timely adoption of a "contactless" museum experience.

Keywords: Interactive Art, Immersive Experience, User Experience Design, Digital Exhibition, Digital Storytellilng

Ⅰ. Introduction

As institutions which collect, preserve and present artworks, art museums have functioned as a source of public education for a long period of time (Greene et al., 2014; Newsom and Silver, 1978). Despite their long history, art museums now face a major change in their market. That is, museums in modern society serve to a broader public than their early predecessors (Stephen, 2001; Schonfeld and Sweeney, 2019). This transition from elitism to inclusion is crucial because it transforms art museums into tourism sites and their visitors into consumers (Navarrete, 2019); various marketing strategies and new exhibition tech-

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nologies are thus required (Rodney et al., 2015).

In response to such transition, many art museums have incorporated diverse information technologies, such as audio guides, interactive kiosks, animated videos (Pallud and Monod, 2010), and more recently Augemented Reality (AR) (Serravalle et al., 2019) and Virtual Reality (Serravalle et al., 2019; Shehade and Stylianou-Lambert, 2020), to attract and appeal to more people. One of the key objectives of using diverse technologies is the curation of immersive experiences (Tim et al., 2018). Indeed, a number of art museums have started to open digital exhibitions to provide immersive experience and maximize user interaction. For instance, in 2019, Atelier Des Lumières, a digital art museum in France, attracted more than 1.2 million visitors to its 30-minute immersive exhibition of Gustav Klimt's paintings (Sansom, 2019). In fact, such transition from traditional to digital exhibition is likely to accelerate as authentic representation and interaction are made possible due to the development of highly immersive technologies, such as VR and AR (Wang et al., 2021).

Despite the growing popularity of digital exhibitions, there exist equivocal perspectives on the impact of digitalization of artworks. For instance, researchers have demonstrated that digital exhibition has an advantage of emphasizing the experiential value by expanding visitors' sense of immediacy and participation, which eventually lead to increase in revenue (Elgammal et al., 2020). That is, technology-based exhibitions could re-energize the relationship between art museums and their visitors (Pallud and Monod, 2010). Especially, in case of tech-savvy visitors, who are mostly millennials and Gen Zs that have significant purchasing power,[1] digital experiences foster their loyalty and economic support on museums (Zollo et al., 2022). Skeptics of digital exhibitions, on the contrary, are concerned of losing physicality and static nature of art objects, straying from art museums' original missions to preserve and educate, and subsidizing the cost of technological initiatives (Anderson, 1999; McPherson, 2006; Rottenberg, 2002).

The transition from traditional to digital exhibitions has drawn attention from researchers of diverse fields, including Information Systems (IS). After demonstrating key advantages of digitalizing art collections, researchers have examined factors that maximize visitors' satisfaction in digital exhibitions (Liu and Zhang, 2022). For instance, both system attributes (i.e., media richness) and visitor attributes (i.e., personal innovativeness and expected confirmation) are found to increase visitors' level of engagement in digital exhibitions (Wu et al., 2021). Moreover, the use of multiple digital technologies, rather than a single digital feature, could contribute to creation of values for both museums and visitors (Jung and tom Dieck, 2017). Most importantly, researchers have revealed that the role of digital exhibitions extends from enhancing visitors' satisfaction to increasing their purchase intentions (Elgammal et al., 2020).

Despite the increased scholarly attention toward digital exhibitions nowadays, the discipline is far from mature. In particular, little research effort has been made to identifying unique features of digital exhibitions and gauging their impacts on visitors' experiences and behaviors. As such, our study identifies animated images and storytelling as two unique features of digital exhibitions and examines their effects on digital museum visitors' immersive experiences, which in turn affect visitors' willingness-to-pay (WTP) price premium. More specifically, storytelling

1) https://www.forbes.com/sites/jefffromm/2022/07/20/as-gen-zs-buying-power-grows-businesses-must-adapt-their-marketing/?sh=3bd34bc2533c

and animated images fulfil one of the key antecedents in immersive experience: absorption (Blumenthal, 2020; Lee et al., 2020). That is, the two features of digital exhibition occupy visitors' attention via vivid visual representation and evoke sensory experience, inducing visitors to fully immerse on the artworks and stimulating visitors to "become part of the experience itself" (Lee et al., 2020). Our findings indicate that animated images and storytelling description not only independently enhance immersion but also create stronger immersion when combined together. The synergetic effect of the two features conjectures that increased absorption facilitates immersive experience of visitors. Stepping further, we also identify that increased immersion facilitates WTP. By analyzing data collected through an online experiment, our study will offer empirical evidence for the value of the two unique features of digital exhibitions by examining a psychological mechanism underlying WTP price premiums of digital museum visitors.

The findings of this paper contribute to both IS literature and museum industry. While there have been active IS research in tourism, museum industry has received little attention despite its substantial market size of 12 billion dollars a year in the United States (IBISWorld, 2019). The newly introduced immersive technologies in today's art museums have brought various research opportunities for IS researchers (Tim et al., 2018). To the best of our knowledge, this paper is one of the first to identify distinct features of digital exhibition and assess the impact of each feature on museum visitors' immersive experience and purchase intention. This paper thus contributes to the IS literature by providing comprehensive understanding of art museums' adoption of digital technologies. Moreover, by assessing the economic value of novel technologies, this paper provides managerial insights of transforming traditional exhibitions into digital exhibitions. Lastly, as museums are central segments of cultural industry, this paper promotes future IS researchers to expand their research area to a broader interdisciplinary field.

Ⅱ. Theoretical Background

2.1. Digital Exhibition

Digital exhibition is an exhibition that "assembles, interlinks and disseminates digital multimedia objects" to maximize user interaction.[2] Instead of presenting brick-and-mortar artworks, digital exhibition relocates traditional artworks into a digital screen. For instance, in digital exhibitions, a person in a painting may disappear from the frame, dance to the music, or even interact with visitors, offering them a sense of immersion. <Figure 1> demonstrates an example of a digital exhibition.[3]

<Figure 1> Digital exhibition

2.1.1. Immersion

One of the primary purposes of digital exhibitions is to increase visitors' sense of immersion. In general,

2) https://www.digitalexhibitions.org/?lan=en&q=References/Definition

3) https://www.seoul284.org/

immersion is defined as "a psychological state characterized by perceiving oneself to be enveloped by [...] an environment that provides a continuous stream of stimuli and experiences" (Witmer and Singer, 1998). Agarwal and Karahanna (2000) have further explained immersion as the state of complete engagement with all of attention focused on a certain task. Indeed, prior studies have acknowledged that immersion increases perceived pleasure when using experience goods (i.e., online games) (Cho et al., 2022). In the context of art museum, researchers agree upon the consensus that immersion is a comprehensive and realistic experience that dominates attention and perceptual apparatus (Dede, 2009; Murray, 2017). It is important to note that immersive experience is not limited to a visual sense. In fact, many museums attempt create a multi-sensory exhibition to establish immersive experiences (Vi et al., 2017). Specifically, this paper follows He et al. (2018)'s classification of immersion into experiential value and imagery vividness.

As a relativistic sense of visitors' interaction with artistic objects, experiential value is a subjective appreciation of the artistic experience in a museum (He et al., 2018). In the context of this paper, experiential value indicates how museum visitors enjoy their experience with the visualization of the artworks. Experiential value is a crucial factor in understanding consumer behavior in tourism industry, as most of the products in tourism industry, including art exhibitions, are experience goods (Holbrook and Schindler, 1994). As consumers of experience goods evaluate their purchases based on the benefits received for the price paid, perceived experiential value is key to the success or failure of museum business (Zeithaml, 1988). Thus, in this paper, experiential value is measured as the key index of museum visitors' feeling of immersion.

The second aspect of immersion in art museums is imagery vividness. Imagery vividness involves the clarity with which one experiences an image. It is different from visual vividness in that it involves not only visual image but also mental image of one's experiences (Bone and Ellen, 1992). The mental imagery helps visitors to fully understand artists' intentions and perspectives by combining sensory input with emotional perception and redefining how visitors themselves feel about the artworks (Starr, 2013). Imagery vividness is therefore a decisive factor in assessing visitors' satisfaction in their museum experience because of its strong influence on the ratings of aesthetic values (Belfi et al., 2018). In managerial perspective, imagery vividness is one of the factors that directly affect brand loyalty and future consumption (Manthiou et al., 2014). Therefore, in this paper, imagery vividness is examined to determine the level of immersion from the digital exhibition experience.

2.1.2. Animation

Digital exhibitions possess distinctive features that are not available in traditional exhibitions. Among these, prior studies mainly highlighted how animated image and storytelling description are critical elements of visitors' interactivity and engagement (Elmezeny et al., 2018; Ioannidis et al., 2013; Wyman et al., 2011). The underlying mechanism is that visual representation and narratives foster people's absorption on the content by stimulating their sensory and imagination, increasing interactivity among individuals. Along the line, this paper focuses on two of such features. Animation is a common digitalization practice that combines temporal sense and visual images (Weng, 2014). That is, compared to traditional still images, animated images in digital exhibitions require

certain period of time to fully endorse the artworks (Cubitt, 2002). For instance, in Atelier des Lumières, visitors were asked to watch the entire sequence of Gustav Klimt's animated paintings for 30 minutes (Sansom, 2019). Such inclusion of temporality into the artworks is quite similar to the experiences that people encounter in reality, where countless actions and sounds take place over the course of time. Digital artworks that integrate both temporal and visual senses thus add liveliness and vigor to the museum experience.

H1: Animated image is positively related to museum visitors' experiential values.

H2: Animated image is positively related to museum visitors' imagery vividness.

2.1.3. Storytelling

In traditional art museums, museum labels – twenty to fifty-word descriptions about the exhibited artworks – provide textual commentary of the artworks. However, the multisensory digital exhibitions offer much more than informative descriptions; they present stories. As a narrative that conveys culture, history and values, storytelling is a powerful method to unite people and ideas (Boris, 2017). In various fields that are not restricted to arts, the effect of storytelling on people's attitude or involvement in the content has been widely studied. For instance, narrative engagement via storytelling affect people's prosocial attitude and involvement towards the content by absorption (Pressgrove and Bowman, 2021). Moreover, in marketing, the significant effect of storytelling marketing on consumers' perception of brands is acknowledged (He et al., 2021).

In our context of digital exhibitions, people and objects in the paintings act, interact, and even speak in intriguing ways to convey meaningful messages to the audience. Storytelling in digital exhibitions thus involves an interaction between the teller (i.e., artworks) and the listener (i.e., visitors). It is inherently participatory and immersive, as the teller of the story invites listeners into diverse situations from which the listeners could emotionally relate. Thus,

H3: Storytelling description is positively related to museum visitors' experiential values.

H4: Storytelling description is positively related to museum visitors' imagery vividness.

2.1.4. The Interaction Effects of Animation and Storytelling

According to studies on multiple sensory modalities, people use multiple sources of sensory information to perceive external environment and the integration of those sources form a robust perception (Ernst and Bülthoff, 2004). That is, the combination of multisensory cues improves memory and attention and thus enhances user engagement, while isolation of sensory cues diminishes user engagement in immersive system (Covaci et al., 2018; Elmezeny et al., 2018). Without exception in digital exhibition context, the combination of visual and aural senses is found to "offer an interesting context of interface design and cognitive psychology exploration" (Terrenghi and Zimmermann, 2004). As such, in addition to the main effect of each feature, we examine the interaction effect of these features on museum visitors' immersive experiences.

H5: The effect of animated image on experiential values is higher with storytelling description than with informative description.

H6: The effect of animated image on imagery vividness

is higher with storytelling description than with informative description.

2.2. Willingness-To-Pay Price Premium

In addition to the main and interactive effects of digital exhibition features on visitors' immersive experience, this paper further examines how such immersion impacts visitors' willingness-to-pay price premium (WTP). Traditional economic literatures outline price premium as the price that yields above-average profits (Klein and Leffler, 1981). In the same vein, WTP of this paper is defined as visitors' willingness to pay at a higher price than the normal or competitor's price (He et al., 2018). When making an experiential purchase (e.g., exhibition ticket), consumers tend to value the opportunity to enhance their enjoyment of experience (Clarkson et al., 2013; TM et al., 2021). That is, consumers of experiential goods, compared to those of material goods, are more likely to pay price premiums as long as their experience could increase their satisfaction and well-being (Nicolao et al., 2009). Therefore, we expect that the immersive experiences from digital exhibitions would have positive impact on WTP:

H7: Experiential value positively affects museum visitors' WTP.

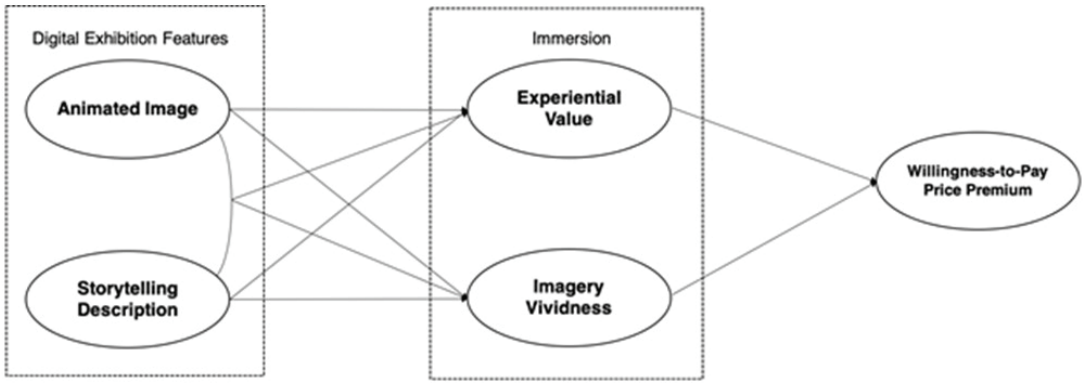
H8: Imagery vividness positively affects museum visitors' WTP.

The research framework of this paper is illustrated in <Figure 2>.

Ⅲ. Research Methodology

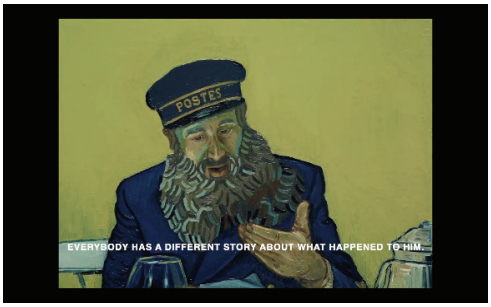
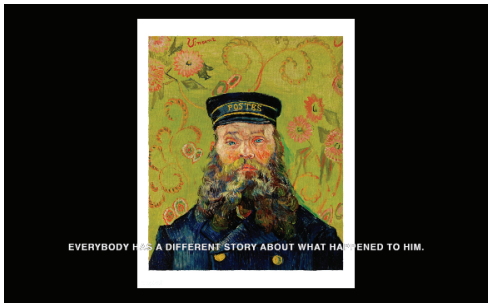
3.1. Experiment Setting

To test the proposed hypotheses, a two (art types: still image versus animated image) by two (description types: informative description versus storytelling description) experimental design was employed. The four artworks, each of which contains unique combination of art types and description types, are employed to measure the effect of animated image and storytelling description. As for the animated image, participants were presented with a trailer video of Loving Vincent (2017), a world's first fully painted animation film with 64,000 frames in oil paintings in the style identical to that of Vincent



<Figure 2> Research Framework

<Table 1> Different Combinations of Artworks

Treatment	Animated Image	Still Image
Storytelling Description		
Informative Description		

van Gogh (Mackiewicz and Melendez, 2016). The trailer of Loving Vincent is selected as the treatment of animated image because the movement of characters in the film is identical to that of objects in digital exhibitions. The trailer is played for approximately one-minute and presents six paintings of Vincent van Gogh in animated format. As for the treatment of the still images, the same six paintings are presented but in a traditional, still format. These paintings include Landscape with Chariot (1890), Portrait of Adeline Ravoux (1890), Portrait of Postman Roulin (1888), Bedroom in Arles (1888), Café Terrace at Night (1888), and Self Portrait (1889).

The description type is manipulated by the conveyance of either informative description or storytelling description. Both descriptions provide brief introduction about Van Gogh's commitment of suicide and numerous speculations regarding his death. However, while the storytelling description contains the voices of actors and actresses in Loving Vincent, the informative description consists of a voice narration about autobiographic description. Detailed information and screenshots of each treatment are provided in <Table 1>.

3.2. Experiement Procedures

Before conducting the main experiment, a pilot test with a sample 20 undergraduate students was conducted to collect small-scale data and receive feedback on the scale items. The main study was initiated after confirming the satisfactory results. The participants of the main experiment were 120 undergraduate students (who did not participate in the pilot test) from a major university in South Korea. The experiment took place online and participants

were provided with links accessible via PC and mobile environment. In the beginning of the experiment, participants were instructed with a scenario of visiting two different types of art exhibitions. In the first exhibition, all participants were exposed to the traditional, plain paintings of Vincent van Gogh. Then, they were randomly assigned into one of the four digital exhibitions that displayed the same paintings but in different combination of art types and description types (see <Table 1>). After watching the two art exhibitions for approximately 2 minutes, participants were instructed to complete the post-experiment questionnaire that measured immersive experience and WTP. The questionnaire also measured demographic information and control variables as well. On average, participants have spent approximately 5 to 8 minutes to complete the experiment and were rewarded with a coffee coupon that is worth US $5.

3.3. Measurement

Measurement items for experiential value were adapted from the measurement scales of Mathwick et al. (2001). However, as the current study is concerned with museum visitors' experiences rather than the shopping preferences in retail systems, the items were adapted to focus on the effectiveness of artworks in creating satisfactory values. The imagery vividness was measured with five items developed by Bone and Ellen (1992). Instead of imagery vividness towards brands, the keywords were adjusted to measure participants' imagery vividness towards exhibited artworks. In particular, five aspects of imagery vividness – clarity, vividness, intensity, liveliness, and definition – were measured. The three items for WTP, which asked for the willingness to pay higher ticket price than traditional exhibition, were adapted from Baker and Crompton (2000) and Dwivedi et al. (2018). All items were measured on a 7-point Likert scale with 1 meaning "not at all likely" and 7 meaning "extremely likely." Furthermore, participants' previous visits to art exhibitions were further measured as a control covariate that might affect individuals' behavioural responses to the exhibited artworks. As the experiment was conducted in South Korea, the questionnaire was translated into Korean first, and then a backward translation was conducted.

Ⅳ. Data Analysis and Results

4.1. Participants Background Information

Participants were invited and surveyed online for five days from May 18 to May 22, 2020. The participants were undergraduate students from a management course. After the experiment, in order to screen out unsuitable respondents, participants were asked whether they have received story-like descriptions or factual descriptions, depending on the experiment group they were assigned to. Only those who answered correctly to the intended treatment were ultimately measured. After dropping 9 participants who did not pass the manipulation check, a total of 111 participants were included in the analysis. Among the final participants, 38.74% were female and 61.26% male. The age ranged from 20 to 28, with the average age of 23. The monthly income ranged from $0 to $3,000 or higher. On the question about the number of visits to art exhibitions in a year, approximately 40% answered that they have visited at least 3 art exhibitions. Detailed demographic information is outlined in <Table 2>.

<Table 2> Demographic Information

Demographic variable		Frequency	Percentage
Gender	Female	43	38.74
	Male	68	61.26
Age (year)	20-22	54	48.65
	23-25	47	42.34
	26-28	10	9.01
Monthly income (US$)	0-1,000	92	82.88
	1,001-2,000	13	11.71
	2,001-3,000	2	1.80
	Over 3,001	4	3.61
Prior museum experiences (number of visits)	0-2	67	60.36
	3-5	26	23.42
	6-8	13	11.71
	Over 9	5	0.45

4.2. Experiential value

Following Yi et al. (2017), the multivariate analysis of variance (MANOVA) was first conducted on both experiential value and imagery vividness. Gender, age, income, and prior museum experiences were included as covariates. The Cronbach's alphas for experiential value and imagery vividness are 0.918 and 0.936, respectively, indicating adequate internal consistency of the measurement (i.e., above 0.70) (Hair et al., 1998). The results demonstrate that there is a significant interaction effect between animated image and storytelling descriptions on both experiential value ($p < 0.001$) and imagery vividness ($p < 0.05$). Thus, to maximize experiential value and imagery vividness to visitors, combined application of the two features is suggested. Afterwards, follow-up ANOVAs were conducted to examine the effects of animated image and storytelling description on each of the two dependent variables separately.

ANOVA results on the experiential value reveal the significant main effect of animated images ($F(1,103) = 3.542$, $p < 0.1$), indicating that the animated images, compared to still images, led to a significantly higher level of experiential value. Therefore, the H1 was supported. Furthermore, the storytelling description of the artworks also had a significant positive effect ($F(1,103) = 16.675$, $p < 0.001$). The results thus reveal that presenting storytelling descriptions also resulted in significantly higher level of experiential value than presenting informative descriptions, thus supporting H2. Lastly, there was a significant interaction effect between animated images and storytelling descriptions on experiential value ($F(1,113) = 20.488$, $p < 0.001$; see <Tables 3> and <Tables 4>). As a result, H5 was supported as well. Overall, these results on experiential value conjecture not only that animated images and storytelling descriptions separately improve experiential value of visitors, but also that the combination of these two features could escalate the overall museum experience.

<Table 3> ANOVA Test – Main and Interaction Effects

		Animated Image	Still Image
Experiential Value	Storytelling Description	5.717 (0.179)	5.042 (0.239)
	Informative Description	3.631 (0.295)	4.976 (0.207)
Imagery Vividness	Storytelling Description	4.911 (0.231)	4.300 (0.251)
	Informative Description	3.592 (0.358)	4.152 (0.237)

<Table 4> Means and Standard Deviations of the Four Conditions

Source	Dependent Variable	df	Mean Square	F	Sig.
Animated Image	Experiential Value	1	4.884	3.542	0.063
	Imagery Vividness	1	0.002	0.001	0.974
Storytelling Description	Experiential Value	1	22.989	16.675	0.000
	Imagery Vividness	1	17.337	8.614	0.004
Animated Image × Storytelling Description	Experiential Value	1	28.246	20.488	0.000
	Imagery Vividness	1	10.704	5.318	0.023

4.3. Imagery Vividness

ANOVA result of animated images on participants' imagery vividness demonstrates that the presence of animated images did not have a significant main effect ($F(1,103) = 0.001$, $p > 0.1$), indicating that participants did not experience significant level of imagery vividness when they were presented with animated images. Therefore, H3 was not supported. The result indicates that motion graphics in art itself do not leave strong impression to the audience. Storytelling description, on the other hand, had a significant and positive effect on the imagery vividness, thus supporting H4 ($F(1,103) = 8.614$, $p < 0.01$). Possibly, when people relate art images with their understanding of the context, they may get immersed with the content, experiencing more intense imagery vividness. Interestingly, there was a significant interaction effect between animated images and storytelling description on imagery vividness, supporting H6 ($F(1,103) = 5.318$, $p < 0.05$; see <Tables 3> and <Tables 4>). The interaction effect of animated images and storytelling descriptions on both experiential value and imagery vividness indicates that animated images have greater impact on participants' experiential value and imagery vividness when storytelling description is also presented. This is especially evident in imagery vividness, which confirmed that the animated images enhance imagery vividness only when storytelling description is also present.

4.4. Willingness-to-pay Price Premium (WTP)

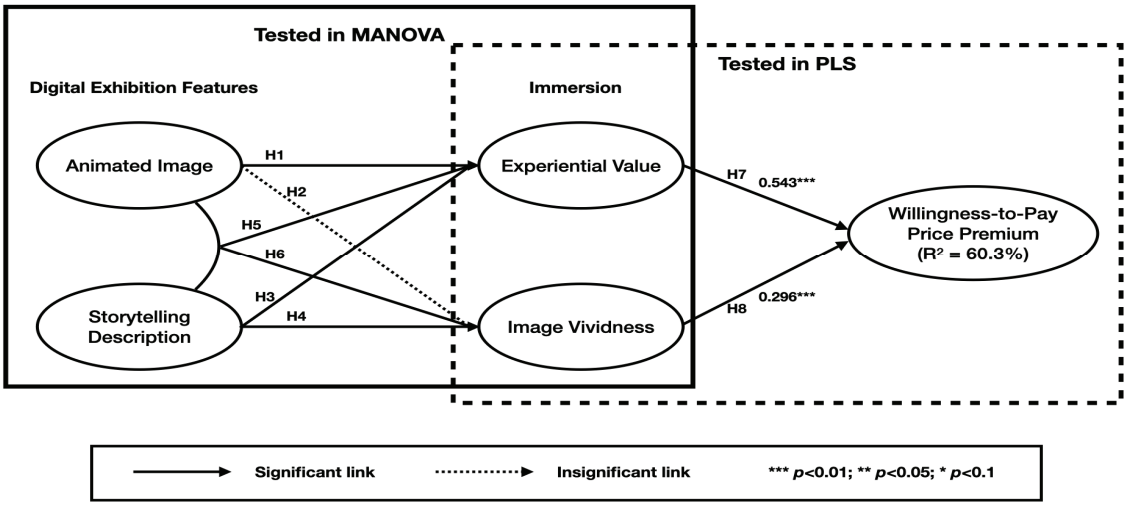
Partial least squares (PLS) was used to examine

<Table 5> Loadings and Cross Loadings of Measures

	Experiential Value	Imagery Vividness	WTP
EV1	**0.899**	0.546	0.639
EV2	**0.802**	0.577	0.596
EV3	**0.851**	0.605	0.576
EV4	**0.904**	0.645	0.691
EV5	**0.884**	0.613	0.722
IV1	0.516	**0.893**	0.545
IV2	0.620	**0.927**	0.604
IV3	0.707	**0.917**	0.708
IV4	0.655	**0.826**	0.558
IV5	0.546	**0.897**	0.544
WTP1	0.723	0.680	**0.954**
WTP2	0.726	0.626	**0.969**
WTP3	0.719	0.638	**0.981**

the structural modeling regarding the effects of experiential values and imagery vividness on WTP. First of all, the measurement model was assessed. As outlined in <Table 5>, the measurement items loaded heavily on their respective constructs (i.e., loadings above 0.70), demonstrating adequate reliability (Hair et al., 1998). Moreover, the composite reliability and Cronbach's alpha scores in <Table 6> demonstrate satisfactory internal consistency. The discriminant validity was also confirmed, as the square root of the average variance extracted (AVE) of each latent variable was greater than the correlations between that latent variable and other latent variables (Barclay et al., 1995). Furthermore, in <Table 5>, the loadings of indicators on their respective latent variables are greater than that of other indicators, thus further supporting discriminant validity.

After confirming reliability and validity of the measurement model, the structural model was further analyzed to examine the path significance. The results, as illustrated in <Figure 3>, indicate that both experiential value (β = 0.543, p < 0.001) and imagery vividness (β = 0.296, p < 0.001) had significant positive effects on WTP (R^2 = 60.3%). Hence, H7 and H8 were supported. In other words, when visitors perceive that the value of the museum experience and imagery vividness is higher, they would gravitate to consume the art works presented. To further confirm that experience value and imagery vividness indeed mediated the effect of animated images and storytelling descriptions on WTP, a bootstrap test was conducted (with 500 bootstrap samples and 95% bias-corrected confidence intervals). While the results indicate that the indirect effect of storytelling description on WTP was positive and significant (95% CI = 0.201 to 0.418; p < 0.001), the indirect effect of animated images on WTP was not significant (95% CI = −0.151 to 0.075; p > 0.5). Insignificance of animated images on WTP further implies that motion of graphics is not a sufficient condition for individuals to be immersed with the art work, thereby lacking the motivation to spend more money on digital exhibitions. As animated images affected imagery vividness only when storytelling description



<Figure 3> Research Framework: Testing Results

<Table 6> Internal Consistency and Discriminant Validity of Constructs

	Composite Reliability	Cronbach's Alpha	Experiential Value	Imagery Vividness	WTP
Experiential Value	0.939	0.918	**0.869**		
Imagery Vividness	0.951	0.936	0.688	**0.893**	
WTP	0.978	0.966	0.746	0.670	**0.968**

Note: ** Bold numbers are the square roots of the AVE values, while the off-diagonal elements are correlations between the variables.

was also provided, a moderated mediation model was thus tested. Indeed, the bootstrapping test results for the moderated mediation model demonstrates that the animated images had positive and significant indirect effect on WTP only when moderated by storytelling description (95% CI = 0.013 to 0.117; $p < 0.10$).

Overall, the results demonstrate that animated images and storytelling description are more effective when presented together in increasing not only experiential value and imagery vividness but also WTP.

Ⅴ. Discussions and Implications

In this paper, we not only examined the main and interaction effects of digital exhibition features but also confirmed the mediating effects of the experiential value and imagery vividness on WTP. First of all, the individual effect of digital exhibition features on two elements of immersive experience was measured; the results confirmed that, except for the effect of animated images on imagery vividness, the effects of individual digital exhibition features on immersion were positive and significant. One possible explanation to the rejection of our hypothesis on the effect of animated images on imagery vividness

could be the difference in display size between the actual digital exhibitions and the experiment. Nevertheless, our MANOVA analysis revealed that, while animated images alone did not have significant impact on imagery vividness, it did have significant and positive effect when presented with storytelling description. Lastly, the structural model of experiential value and imagery vividness on WTP was measured using PLS. The results confirmed the significant and positive effect of both experiential value and imagery vividness on WTP.

This paper provides several academic and practical implications. First, the effect of immersive technologies on users' purchase intentions was examined in a novel context of museum industries. While museums have transformed into tourism sites and started to adopt diverse digital technologies to attract more visitors, IS research on such technologies remains scant. By examining how specific features of immersive technologies enhance visitors' immersive experiences and purchase intentions, this paper contributes to the IS literature by expanding its research area to a broader interdisciplinary field. Furthermore, whereas previous studies have only focused on digital exhibition as a whole, this paper examines specific features (animated images and storytelling description), both individually and interactively. Our findings extend Bell et al. (2018), which highlights the significant impacts of animation and Mathias (2022), which identifies the role of storytelling in immersion, by empirically demonstrating that the combination of these multiple digital exhibition features could further enhance digital museum visitors' experiential value and imagery vividness. Moreover, this study offers and validates the underlying psychological mechanism to explain how these digital exhibition features enhance their WTP. As such, this paper successfully advances our understanding of the role of immersive technologies in enhancing digital museum visitors' experience.

In terms of practical implication, this research provides specific guidance to museum practitioners on features that increase visitors' immersive experiences in the context of digital exhibition. Implementation of latest technologies, such as AR and VR, has already started to take place in digital exhibition setting (Cárdenas Gasca et al., 2022; Lupascu et al., 2021; Zhou et al., 2022). However, prior research mainly discuss the general impact of implementing these technologies on immersive experience while lacking specific focus on the drivers of such impact. For instance, previous research identified that applying AR in human rights museums could bring unintended consequences such as revictimization of the authors (Cárdenas Gasca et al., 2022). However, there is a lack of of discourse on which features of AR could lead to greater immersion and the negative consequences. On contrary, our study provides practical advice to practitioners in the field of art. Especially, the findings indicate that, rather than solely focusing on visual representation or authenticity, practitioners should pursue the interplay of story and animated images improve visitor's immersive experience. More explicitly, practitioners could include narratives of the artists or the art itself with animated content to facilitate immersion of the audience.

Moreover, the findings of this research guide practitioners to deal with rapid shift of consumption behavior in the field of arts. For instance, in 2020, disruptive COVID-19 pandemic emerged, mandating all the offline museums to shut down and replace the physical visits by online museums. Because COVID-19 has prevailed globally and lasted more than a year, human behavior and lifestyle are projected to be permanently transformed (Servini, 2021). Indeed, "[the]

post-COVID-19 era will bring forward a new normal – one that will accelerate digital transformation in many areas."[4] In addition, as in the case of H1N1 influenza, such catastrophe accompanying social distancing may recur (Carter and Sanford, 2012). Along the line, there is an urgent need for digital transformation in the field of art. In this context, the result of this research presents timely and essential solutions to overcome the abrupt changes in art operations.

Ⅵ. Limitations and Suggestions for Future Research

Although this paper provides novel and comprehensive understandings of digital exhibitions on visitor's immersive experience and WTP, it is not without limitations. First, while major art museum visitors' age ranges from twenties to forties, the participants of our experiment were undergraduate students in their twenties. Nevertheless, as digital exhibitions are mostly embraced by younger generations, we believe that the age of our participants is not a serious issue.[5] In the future research, however, it would be better to include diverse age groups. Second, the subjects were exposed to different forms of artworks and descriptions for only limited period of time, which may have been difficult for them to experience the full immersion. Thus, in the future research, providing longer time to experience an artwork is recommended. Third, participants' previous knowledge about Vincent van Gogh's life would have influenced the results. Although we have not measured participants' knowledge about the artist in this experiment, we expect that it would have positively affected immersive experience and WTP because digital exhibitions create additional values (i.e., experiential and imagery vividness). Lastly, as art museums are currently incorporating even more novel technologies, such as VR and AR, into their exhibitions, studying the immersive effects of these technologies would provide further theoretical and managerial insights.

Ⅶ. Conclusion

Despite the active attempts of art museums to become attractive tourism sites with diverse exhibition technologies, significant IS research progress on the impact of digital exhibitions is yet to be made. As such, this paper provides a comprehensive understanding of digital exhibition, a relatively new exhibition style, by examining the impact of its specific features on visitors' immersive experience as well as willingness-to-pay price premium. The results advocate for the usage of multiple features to enhance not only visitors' immersive experiences but also their willingness-to-pay price premium. These findings serve as a basis for future development in both IS literature and yield valuable insights for museum industry practitioners.

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4) https://www.un.org/en/desa/new-normal-digital
5) https://www.businessinsider.com/how-5-key-art-industry-insiders-are-handling-coronavirus-pandemic-2020-5

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