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Use of Mobile Technology Among Museum Visitors: A Case Study

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The Rochester Institute of Technology

Department of Communication

College of Liberal Arts

Use of Mobile Technology Among Museum Visitors: A Case Study

by

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in Communication & Media Technologies

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USE OF MOBILE TECHNOLOGY AMONG MUSEUM VISITORS: A CASE STUDY

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Abstract

Museums have employed mobile modes of communication for decades: pamphlets and audio tours. The popularity of mobile technology prompted museums to integrate mobile experiences with personal devices. A survey collected information from the Memorial Art Gallery (MAG) email list to understand adoption of MAG's mobile experience through the lens of the technology acceptance model to learn how perceived usefulness and perceived ease of use influence visitors use or intent to use MAGart 2.0. The study proposed two museum specific variables, MAG frequency of visitation and MAG engagement, to examine adoption of MAGart 2.0. Results suggest behavioral intention and actual use of MAGart 2.0 are positively related to perceived usefulness, perceived ease of use, MAG frequency of visitation, and MAG engagement.

Keywords: museums, technology adoption, mobile applications, mobile technology, Technology Acceptance Model (TAM)

Use of Mobile Technology Among Museum Visitors: A Case Study

The trend among 21st century museum visitors is towards active participation, including expectations of personal relevance, interactivity, easy access, and personalized control of content (Tallon, 2008). The majority of museum visitors walk through the doors with handheld media of their own already in their pockets (Parry, 2008). The most current Nielsen data show that United States smartphone ownership among adults has grown from 41% in 2011 to 55.5% in 2012 to 68% as of January 2014 (Nielsen, 2012, 2014b). Based on this steadily growing rate, more and more museums are integrating mobile experiences through personal devices into their exhibitions to create an active, user-directed experience where visitors can use the tools they have already incorporated into their daily lives. Media are rarely the reason people say they visit museums, however when asked directly, most museum visitors today understand the benefits of technology and media in museums (Falk & Dierking, 2013). Museums incorporate handheld digital devices in museums to provide further information about collections and exhibits, and offer audiences an engaging experience.

While mobile technology in museums may seem like a 21st century concept, the truth is museums have been using mobile modes of communication for decades. Guidebooks, pamphlets, and the ever popular traditional audio tours are all “mobile” tools for communication intended to expand visitor engagement and enjoyment (Parry, 2008). However, current mobile technology, such as smartphones, open up opportunities that print and the traditional audio guide can't by allowing museums to cater to visitors with diverse learning styles and those who seek different types of information (Gammon & Burch, 2008). While technology is changing rapidly, the ongoing studies of museums and their audiences indicate that mobile devices will be an

important means of access for museum visitors today and in the future (Tallon, 2011). Falk and Dierking (2013) state that “media is already and will continue to be a critical component of interactivity especially for youth who are comfortable and extremely facile with technology” and that incorporating media “represent a strategy for creating museum comfort today for tomorrow’s museum going public” (p. 119). The 2011 Museums and Mobile surveys found that over half of responding large museums already have mobile experiences, and almost 70% of all museums say their institution will have in-house mobile content development by 2016 (Tallon, 2011).

Many articles about mobile technology in museums speak about the creation of mobile content and the type of information featured, focusing on the decisions made by museums in conjunction with technology developers. The most popular objective for a mobile project in museums is to experiment with visitor engagement (Tallon, 2013). Therefore, it is not surprising that most research aims to discover if handheld multimedia technology enhances visitor engagement by instructing visitors to use mobile devices and then asking questions about their experience. While this can provide helpful information in the creation of a museum mobile experience, it does not address the question of whether visitors are inclined to use mobile technology of their own free will. According to Rodley (2011), getting people to download and launch a mobile application (app) is the biggest hurdle museums will face. Tallon (2013) states that institutions that currently offer (or plan to offer) a mobile experience don’t consider their target audience to be “tech savvy” which begs the question of why so many institutions are spending their time developing these experiences for visitors. Smith (2009) agrees that one of the most important problems not being addressed by museums developing mobile technology is identifying the intended audience. Smith laments that even after hundreds of pilot multimedia

mobile projects, identification of the target audience for mobile experiences has not been answered. Gammon and Burch (2008) feel that simply looking at visitors' affinity for their mobile phones does not indicate the visitor's perception of the phone's usefulness as an interpretive device in a museum setting. They suggest qualitative research to explore the relationship between visitor motivation, expectations of the mobile product, as well as visitor adoption of the technology to create better mobile experiences. Along these conceptual lines, this study inquires about who is adopting or is likely to adopt this technology, and why or why not.

A case study at the Memorial Art Gallery (MAG), in Rochester, New York, examines MAG visitor intentions to download the MAG mobile app, MAGart 2.0. Among those that have already downloaded and used MAGart 2.0, this study aims to examine why by analyzing possible significant variables. This will be examined by utilizing the technology acceptance model (TAM) which is used to explain visitor intentions and actions by finding out visitors' perceived usefulness of the app's features, and perceived ease of use of the app, and how that relates to both intent and actual use of MAGart 2.0. The study will also look to find out if frequency of visitation to the MAG and engagement with the MAG has a relationship with visitor's likelihood to download MAG 2.0. The literature review explores the changing mobile technology within art museums, current research on visitors' feelings towards mobile technology in museums, and how visitors use and respond to mobile technology in museums. Finally, the literature review will discuss the TAM and mobile application adoption. The purpose of this study is to discover what factors contribute to those using or intending to use MAGart 2.0. The first variables, perceived ease of use and perceived usefulness, are hypothesized using the TAM. The second set of variables, frequency of MAG visitation and MAG engagement, are

specific to the museum environment, have not been asked before in TAM research, and therefore are Research Questions that this study answers.

Hypotheses

H1a. Among non-MAGart 2.0 users, the perceived ease of use of MAGart 2.0 is positively related to perceived usefulness of MAGart 2.0.

H1b. Among MAGart 2.0 users, the perceived ease of use of the MAGart 2.0 is positively related to perceived usefulness of MAGart 2.0.

H2a. Among non-MAGart 2.0 users, the perceived usefulness of MAGart 2.0 is positively related to behavioral intention toward MAGart 2.0

H2b. Among non-MAGart 2.0 users, the perceived ease of use of MAGart 2.0 is positively related to behavioral intention toward MAGart 2.0.

H3a. Among MAGart 2.0 users there is a higher perceived usefulness of MAGart 2.0 than among non-MAGart 2.0 users.

H3b. Among MAGart 2.0 users there is a higher perceived ease of use of MAGart 2.0 than non-MAGart 2.0 users.

Research Questions

RQ1a. What is the relationship between frequency of visitation to the MAG and behavioral intention towards MAGart 2.0 among non-MAGart 2.0 users?

RQ1b. What are the differences in frequency of visitation to the MAG between MAGart 2.0 users and non-MAGart 2.0 users?

RQ2a. What is the relationship between MAG engagement and behavioral intention towards MAGart 2.0 among non-MAGart 2.0 users?

RQ2b. What are the differences in MAG engagement between MAGart 2.0 users and non-MAGart 2.0 users?

Literature Review

Mobile Technology and Art Museums

The art museum is no stranger to a change among its audience's expectations and motivations. To adapt to changing audiences, museums have changed roles many times; they began as cabinets of curiosity, private collections, and storehouses of objects. Early museums were intended for an educated upper class, works of art were meant to speak for themselves, and visitors were expected to know about art. The only information given to visitors was the name of artist, the name of the artwork, the date it was created, and the country of origin (Giusti, 2008). The 20th century shifted the museum's focus from the object to the subject, and museums became educational centers whose core function was to serve the public by creating displays, guidebooks, and brochures to provide access and information. According to Giusti (2008), in the middle of the 20th century more people wanted to participate in the cultural life of cities while at the same time museums wanted to demonstrate relevance and increase revenues, and therefore began seeking out more visitors. "But these new audiences lacked the aesthetic upbringing or background to interpret the information before them; this obliged museums to reconsider their visitor provisions. Information was no longer sufficient; user-friendly interpretation was required" (Giusti, 2008, p. 98). Museums had to consider different ways to educate and inform their audience, and coinciding technological developments led to the beginnings of handheld technology within the museum.

The first audio tour was introduced in 1952 and has since become an innate part of museums. These first generation guides of the electronic age have become a mainstay of many

institutions and a staple companion for many visitors. The first audio tours were linear, where the audio corresponded to the wall labels while the visitor viewed the object (Samis, 2008).

Visitors surrendered a level of personal control over their visit to follow a pre-determined, linear path through museums (Giusti, 2008). In the late 1980s a significant shift in museum communication began to take shape as the singular authoritative voice began to change to many voices. This change, coupled with advances in technology, allowed for multiple perspectives to better mesh with multiple learning styles, points of access, and experiences of a wide range of audiences who come to the museum with different levels and areas of knowledge and interest. These newly designed tours were no longer strictly linear, and offered the ability to access as much or as little information about a work as the individual visitor wanted. The visitor could choose where to stop and what to listen to; their museum path was no longer strictly dictated by the audio tour (Samis, 2008). This new audio tour allowed for choice; it allowed the visitor to access an overview of an exhibition or delve more deeply into specific information about a piece of work. Visitors were able to navigate between freedom and structure, which allowed for an overall linear component alongside user-controlled elements (Smith & Tinio, 2008).

As museums entered the 21st century, technology again became a force, changing the way that museums communicated with their visitors. Several new types of media came on the scene, such as the Personal Digital Assistant (PDA) and the iPod, and began to offer different ways to engage with audiences. The introduction of podcasts, compressed files that can be shared through the internet, became a prevalent way for museums to incorporate handheld devices to provide audio and visual material to visitors. The MP3 format allows for much more content in a smaller file which allows the museum to provide much more information to visitors than a traditional audio guide (Schwarzer, 2001). Podcasts are similar to storytelling as a means of

engaging visitors as they often present a first person narrative (Buffington, 2010). Museum podcasts have taken a variety of formats including recordings of lectures, formal gallery tours, in-depth investigations of a few works of art, interviews of artists, and even children's interpretations of art. With the introduction of PDAs and newer iPods, visitors were also able to view short clips of video content in addition to listening to audio. While art museums have been showing video in their galleries for some time now, the ability to choose clips, control the sound, and stand directly in front of different works while viewing, provide a new experience for visitors (Lopez, Daneau, Rosoff, & Congdon, 2008).

The increasing prevalence of smartphones has once again opened up new ways for museums to engage with visitors. The first smartphone was introduced in 1999 but did not become popular until 2003 (Raento, Oulasvirta, & Eagle, 2009). Since then, smartphone ownership has grown to 68% as of January 2014, up 9% from the start of 2013 (Nielsen, 2014b). These numbers continue to steadily grow with no sign of decline. Beasley and Conway's (2011) study, conducted through the Museum of Science and Industry in Chicago, found that adults who own a smartphone were about twice as likely as those with feature phones or no devices to consider themselves very knowledgeable about, and comfortable with, digital media. Fewer than 5% of adults with smartphones said that they were not comfortable with or not knowledgeable about digital media. The smartphone application is a way to combine all previous types of mobile technology into one which allows for text, audio, and video to communicate with audiences. A 2013 Nielsen report found that United States adult smartphone users spent 89% of their mobile media time using mobile apps (Nielsen, 2014a). The popularity of the smartphone and the smartphone app, coupled with its ability to provide a multimedia platform for information, have led to museums taking notice and creating apps for museum audiences.

The first museum application was developed in 2010 and the American Association of Museum's survey projected that a third of all museums in the United States had introduced mobile technology in 2011 of which smartphone apps experienced the fastest growth (Rodley, 2011). This multimedia platform can offer many different experiences, including images of related objects not on display, interviews with artists and curators, text, music, and video footage from related materials, all while providing several different channels of sensory information (Filippini-Fantoni & Bowen, 2008). While not all museums have developed mobile applications for smartphones, it is clear that offering mobile experiences for visitors remains a very important component for museums. The most current research by Tallon (2013) found that 35% of responding cultural institutions currently offer a mobile application and 34% have plans to offer one within a year. Institutions surveyed that did not have (or plan to have) a mobile experience identified insufficient staff (57%) and cost (46%) as the key reasons, while only 13% thought mobile technology was unsuitable for their institution.

Technology Adoption by Visitors in Museums

Handheld technologies were among the first technologies to be fully embraced within museums and remain the most successful museum technology. Each year approximately 35 million audio tours are distributed in museums, cultural sites, and attractions around the world, with half of art museums offering an audio tour (Tellis, 2004). It has become a powerful way that museums can offer choice and individualized learning options to visitors which enhance visitor interaction and learning in museums (Falk & Dierking, 2008). While museum experts can certainly tout the benefits and pitfalls of incorporating mobile technology in museums based on their own mission and philosophies, it is important to look at how visitors feel about the adoption of technology within the museum and visitor perception of technology's place in a museum

environment. Several studies have focused on the visitor's experience with mobile technology in museums and they found varying results about visitor interest, comfort, and satisfaction.

While museums have clearly realized the need to incorporate current mobile technology, there is considerable concern over alienating museum visitors who may be unfamiliar and uncomfortable with using newer mobile technology. The National Gallery in partnership with Antenna Audio was the first museum in the world to release a downloadable application for iPhone and iTouch mobile devices in 2010. The application aimed to appeal to "a generation of people who are demanding users of new mobile technologies, and who appreciate the ability to explore content at their leisure, whilst on the move" (Lagoudi & Sexton, 2010, p. 1). While the intent of the app was stated as creating access to "internet natives," the study also stated that they wanted to create a quick and easy download that would work for a broad audience with no specific profile and offer a variety of access points. The researchers' found that there was an overwhelming positive tone from those who left comments on the iTunes store about the application. The main criticism was the large download size; however, users indicated that while slow to download the high quality of the application was worth the time and space used. Writing about the future of the application, Lagoudi and Sexton (2010) felt that despite the success of the application, there was still a need to offer a traditional audio guide due to a large amount of visitors with "low-tech lifestyles" (p. 13). In a similar effort, the San Francisco Museum of Modern Art (SFMOMA) offered both a traditional rented audio guide headset tour as well as a cell phone/podcast tour of the 2006 exhibition *Matthew Barney: Drawing Restraint*. Randi Korn & Associates, Inc. surveyed participants and found that the main reasons visitors chose the audio tour on their own device were familiarity and comfort and being able to access information as needed at a cheaper cost. While most respondents who did not use the rented audio guide

headset were aware of it but chose not to use it, most respondents who did not access the tour through their own device were not aware it was an option (Randi Korn & Associates, 2006).

In addition to exploring discomfort with technology, museums have looked specifically at finding out if mobile technology experiences were a detriment to older audiences. The multimedia guide at Charles Darwin's House, Down House, was an "integral and inclusive part of the visitor experience" and the concern was that the format might hamper the experience of older visitors (Petrie & Tallon, 2010, p. 17). The findings showed that compared to older visitors, younger visitors were far more likely to describe the guide as "accessible, inspiring and fun" as well as rate the guide more highly than traditional guides used at other museums or historic sites (Petrie & Tallon, 2010, p. 17). However, a majority of visitors indicated a preference for the multimedia format of the guide after using it, despite their age. Three quarters of visitors under age 35 preferred multimedia over audio content only and written content, compared with 85% of those age 35 to 54 and 70% of those age 55 and older (Petrie & Tallon, 2010). Petrie and Tallon felt these statistics demonstrated that a multimedia guide satisfied the demands of a younger audience while still meeting the needs of older visitors. Another study of an unnamed historic site approached the question of mobile technology in relation to visitor age from the opposite perspective, investigating whether a younger audience, accustomed to multimedia features in daily life, would be satisfied with a traditional audio tour. This study showed that 50% of those under age 26 and 64% of those ages 26 to 45 would be likely to recommend the audio guide, versus 87% of those ages 46 and older. Similarly it found that only 30% of those under age 26 and 45% of those ages 26 to 45 found the audio guide made their experience much more enjoyable compared to 71% of those age 46 and older. While it can hardly be said that the audio guide was not enjoyable to younger audiences, their satisfaction

level was considerably lower than older audiences. The study found an inverse relationship with regard to preference of guides. Of those under age 35, 42% preferred a multimedia tour while 33% preferred an audio only tour. Of those ages 45 and older, 25% preferred a multimedia tour while 47% preferred an audio only tour (Petrie & Tallon, 2010).

Many museums are concerned about the technology distracting from the museum experience and studies have had mixed results. In their study at the Victoria and Albert Museum, Reynolds and Speight (2008) looked at a group of college students in a design program using PDAs for an “iGuides from StreetAccess” project. This project consisted of web-based trails which offered a more directed experience for museum visitors, much like a guided docent tour. Reynolds and Speight found in an evaluation of the project that there were cases where the engagement with the PDA overtook the museum experience. Some students felt it served as a barrier to interacting with objects, galleries, and other students. Conversely, observations of visitors using the Blanton iTour, an interactive handheld museum guide at the Blanton Museum of Art at the University of Texas at Austin in 2003, indicated that “rather than spending their time absorbed in the technology, visitors demonstrated positive engagement with the works of art” as well as finding that “visitor viewing patterns appeared to be directed and active - seeking out details in the works, moving back and forth between works, moving closer to works, pointing out details to family members and friends” (Manning & Sims, 2004, p. 7). The study found that 67% of visitors using the Blanton iTour were very satisfied with their experience, 28% were somewhat satisfied, and 5% were only a little satisfied (Manning & Sims, 2004). The study found no statistically significant differences between iTour and non-iTour users with regard to gender, race, or age. When asked about their previous museum experiences, both at the Blanton and at other museums, there were no statistically significant differences

between iTour and non-iTour users. When asked to rate different components of the iTour, visitors gave the highest ratings to the iTour's ease of use and its content. Similarly, in a 2003 study at the Tate Modern by Antenna Audio Ltd. of the Tate Modern Multimedia Tour pilot, more than 70% of visitors said they spent longer in the gallery than they would have without the Multimedia Tour with 87% saying that it improved their visit. In this pilot case, the Tate Modern supplied the technology to visitors and 55% of visitors found the Multimedia Tour easy to use, while 45% found it difficult. Visitors generally saw this type of technology as an inevitable part of the future landscape in museums. The content proved to be the primary draw of visitors to use the Multimedia Tour, and results found that visitors wanted more objects on the tour, as well as more information on each.

Rey and Casado-Neira (2013) looked at perceptions and public expectations about the use of information and communication technology (ICT) in museums, including information screens, audio devices and guides, interactive programs, and digital games. They looked at the perception the general public has on digital technologies, paying special attention to their expectations and demands of ICT in museums. They targeted people who had experience with ICT in their daily activities by measuring their technological literacy based on their access to the internet, use of electronic equipment and their use of services associated with ICT as well people who had visited a museum in the past ten years. When asking visitors to rate the attractive aspects of museums, results found that the collection and exhibitions received 76%, followed by information and guided visits at 49% and 46% respectively, with ICT receiving 38% of attractiveness to visitors. The authors interpreted these findings as showing that ICT played an auxiliary role, and that while ICT in the museum was not considered a priority, it was certainly not unpopular. They concluded that while experts see the possibilities of ICT in museums,

visitors did not have a clear idea of the potential of ICT to achieve a more active experience that could lead to greater participation.

Technology Acceptance Model

The technology acceptance model (TAM) developed by Fred D. Davis in 1989 explored information technology in the workplace to better understand, predict, and explain the acceptance of technology use (Davis, 1989). TAM is based on Fishbein and Ajzen's theory of reasoned action (TRA) which suggests that "social behavior is motivated by an individual's attitude toward carrying out that behavior" and that "behavior is determined directly by the intention to perform" (Moon & Kim, 2001, p. 218). TAM uses TRA's fundamental idea of the link between attitude and behavior to explain and predict an individual's acceptance of information technology. Davis (1989) identified two significant factors, perceived usefulness and perceived ease of use, to explain an individual's intention to utilize technology. He defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance" and perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320). TAM utilizes behavioral intention from TRA which is defined as "a person's subjective probability that he will perform some behavior" (Fishbein & Ajzen, 1975, p. 288). Davis (1989) hypothesized and found that perceived usefulness and perceived ease of use directly influence behavioral intention to use technology, which is followed up with the idea that behavioral intention leads to actual system use. In his research implications, Davis (1989) suggested that future technology acceptance research needs to address how other variables relate to usefulness, ease of use, and user acceptance. As discussed by many researchers since, there are many technological contexts beyond the workplace environment that need additional explanatory

variables, particularly in light of the number of emerging technologies (Bruner & Kumar, 2005; Moon & Kim, 2001; Venkatesh, 2000; Zampou, Saprikis, Markos, & Vlachopoulou, 2012). As Zampou et al. (2012) explain, one of the favorable aspects of TAM is when more in-depth explanation of user adoption intention is needed; the model permits other factors to be incorporated easily into its basic model.

TAM and Mobile Technology

TAM researchers have since adapted TAM and applied the theory to many fields other than the workplace including many emerging technologies. This adoption has led to modified TAM models which include other determinants beyond usefulness and ease of use. For the current study at the MAG which looks at technology use in a museum, it is particularly important to look at those that have used TAM in a consumer context, looking specifically at mobile technology as it is most similar in that consumers have free choice whether or not to adopt mobile technologies, rather than mandated technology use for employees in the workplace. Zampou et al. (2012) focused on mobile consumer contexts and proposed that trust, innovation, relationship drivers, and functionality were influential on behavioral intent of mobile services. They found that functionality, which included network coverage, transaction speed, and a user friendly interface, was likely to influence the user's perception of ease of use, but not hinder their adoption intention. They rejected their hypothesis that trust influenced behavior intention through their findings that a user's adoption intention is not influenced directly by safety and security measures. They found that an individual's innovativeness, defined as "the willingness of an individual to try out any new technology," had the strongest effect (Zampou et al., 2012, p. 231). Relationship drivers, characterized by a mobile service's personalization towards its user, also were found to have a positive effect on behavioral intention. In regards to the original TAM

factors applied to mobile services, Zarpou et al. found that perceived ease of use did not seem to have a strong effect on behavioral intention, but found that perceived usefulness did have a positive effect on behavioral intention.

Bruner and Kumar (2005) also used TAM to explain consumer acceptance of mobile commerce through handheld internet devices. They proposed fun/enjoyment as a variable in addition to TAM's perceived ease of use and perceived usefulness. Opposite to Zarpou et al.'s (2012) findings, they found that usefulness had no direct effect on behavioral intention to use mobile commerce. They did find that ease of use and the proposed fun/enjoyment were powerful factors in behavioral intention.

Kim and Garrison (2009) developed a model, the mobile wireless technology acceptance model (MWTAM), to introduce perceived ubiquity and perceived reachability to individuals' intention to use mobile technology. Perceived ubiquity refers to an "individual's perception regarding the extent to which MWT provides personalized and uninterrupted connection and communications between the individuals and other individuals and/or networks," while perceived reachability refers to an "individual's perception regarding the degree to which he or she can 'reach' other individuals 'anytime-and-anywhere' via MWT" (Kim & Garrison, 2009, p. 326). They found that there is more to MWT acceptance and use than TAM's perceived ease of use and usability suggests. Their results confirmed a positive and significant relationship between perceived ease of use, perceived usefulness, and behavioral intention. Their results also showed that both perceived ubiquity and perceived reachability significantly and positively influenced an individual's behavioral intention to use MWT.

While these findings represent a small sample of the research on mobile technology use and TAM, they show that the two basic factors of TAM—perceived ease of use and perceived

usefulness—can apply beyond the work environment to those in free choice mobile technology contexts. They also suggest some of the varying, significant factors that continue to be proposed and explored as extensions to TAM and mobile technology adoption and use.

While the literature on TAM and mobile technology use is important to demonstrate that TAM can be, and continues to be, applied in these free choice environments, as mobile technology becomes more prevalent mobile applications are a specific category to be examined. Yang (2013) states there is “no evidence indicated that the drivers of adoption of mobile services also apply to mobile applications” (p. 86). Similarly, Verkasaloo, López-Nicolás, Molina-Castillo, and Bouwmanc (2010) feel that “models like TAM should not treat mobile services as a generic concept” but instead should be used to “specifically address individual mobile services” (p. 242). While no studies to date have been reported specifically on TAM and museum mobile applications, a review of the few studies done on mobile applications in varying user-directed environments show how TAM applies to situations where users download mobile applications. These studies reveal the extensions to TAM through additional determinants that are applied specific to mobile applications. Yang tried to predict young consumers’ attitudes towards mobile apps, both intent to use and actual use, by surveying 555 college students at a mid-sized public university in Southeast America, age 18-35. In addition to TAM’s perceived ease of use and perceived usefulness, Yang also looked to the theory of planned behavior as well as uses and gratifications to measure attitude, subjective norm, perceived behavioral control, enjoyment, and perceived expressiveness as variables in intent to use mobile apps. He found that perceived usefulness and perceived behavioral control had the highest correlation with intent to use mobile apps; however, perceived ease of use, attitude, subjective norm, enjoyment, and perceived expressiveness did not correlate with intent to use mobile apps. Yang felt that while there was

no correlation, he did not think perceived ease of use should be dismissed as irrelevant for the adoption of mobile apps; among tech savvy, young Millennials, it is very natural to download and use mobile apps, and that young American consumers perhaps take for granted that technology is effortless.

Verkasaloo et al. (2010) studied users and non-users of three selected mobile applications (mobile internet applications, map applications, and game applications) to find out what drives the intention to use these applications across both users and non-users. The study of 579 Finnish smartphone users measured actual usage of mobile applications alongside a web-based survey to test an extended TAM model in explaining intention to use. Instead of using perceived ease of use alongside perceived usefulness, Verkasaloo et al. chose to utilize perceived enjoyment to explain user acceptance, which Davis defined as “the extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated” (Davis, Bagozzi, & Warshaw, 1992, p. 1113). Verkasaloo et al. argue that according to Venkatesh (2000) as people’s direct experience with a technology increases, the role of system-specific perceived enjoyment is expected to dominate and determine perceived ease of use; therefore, only perceived usefulness and perceived enjoyment were looked at as elements directly affecting the intention to use mobile applications in this study. The research found that perceived usefulness and perceived enjoyment were statistically significant for users of mobile internet applications. However, for non-users of mobile internet applications, while perceived enjoyment was significant, there was a lack of significant correlation between perceived usefulness and intention to use. For map applications, they found that perceived usefulness was significant to both users and non-users. Enjoyment was not significant for users, but there was significant correlation for non-users. In the case of map applications, this suggests

that smartphone users are driven more by the utility of this particular service. Finally, for mobile game applications, perceived enjoyment was significant for both users and non-users, while perceived usefulness was not significant for either. The results of this study are particularly interesting as it shows that the type of application produces a variance in the significance of TAM determinants as well as differences between users and non-users.

Kwon, Bae, and Blum (2012) examined customer intentions to download mobile applications in the hospitality industry. To focus on consumer studies, Kwon et al. chose to apply parts of TAM 3 proposed by Venkatesh and Bala (2008) that related to mobile technology use which included three specific determinants of ease of use: enjoyment, easiness, and confidence. They surveyed 235 university students and found that usefulness of mobile applications had a significant relationship with user intentions to download mobile applications. Perceived ease of use, including enjoyment, easiness, and confidence all had statistically significant relationships with intent to download. They also found a significant relationship between perceived ease of use and perceived usefulness. Kwon et al. posited that ease of use was due to the fact that the respondents were technology savvy university students; the respondents enjoyed the applications, thought the applications were easy to use, and had confidence in using them. Bere and Rambe (2013) also looked at university students to explore WhatsApp, a special purpose instant messaging application implemented at a University of Technology (UoT) in South Africa. TAM was utilized to investigate UoT Information Technology (IT) students' choices and decisions to use WhatsApp for academic purposes. In addition to perceived usefulness and perceived ease of use, the study introduced a new variable, perceived convenience, to examine student behavioral intention and actual adoption of WhatsApp. Bere and Rambe administered an online questionnaire and found that perceived

convenience, perceived ease of use, and perceived usefulness, were all significant in students' intent to use WhatsApp for educational purposes.

While findings on TAM and mobile technology are plentiful, findings relating to TAM and mobile applications are much sparser and, as shown, primarily look at the younger audience of university students. However, as is seen in the variety of variables applied to both mobile technology and mobile applications, as well as the variety of results, testing specifically for a museum mobile application is needed to determine the significance of perceived usefulness and perceived ease of use, as well as any additional factors. This is especially true as museum audiences are much more varied in terms of age than any of the mobile application adoption literature available.

Methods

To measure the factors contributing to those using or intending to use MAGart 2.0, an online survey (see Appendix) was sent to those on the MAG email list in May of 2014 with the permission of the MAG. To encourage participation, those who completed the survey and gave their email address were entered into a drawing to receive MAG related prizes.

Participants

Participants were those on the MAG email list and included MAG members, as well as others who signed up in person or through the MAG website for MAG announcements via email. The survey was sent to 9,491 email addresses and 300 respondents provided usable surveys available for data analysis. Participants' ages ranged from 18-24 years to over 75 years with the highest response ratio at 30.3% for the 55-64 age range. Most of the participants were female (females $n = 215$, males $n = 85$), and all participants had some college education, with the highest response ratio at 42.9% for those with a graduate degree.

Procedure

After obtaining institutional review board approval, survey responses were collected from May 20, 2014 to June 12, 2014. The survey was sent via a link in an email with a brief introduction through the MAG's Constant Contact account. The survey link was also posted to the MAG's Facebook page.

Design

Survey responses were collected anonymously, however, those who wished to be entered to win one of the prizes offered had to give their email address so they could be contacted. This was optional, and respondents were ensured that these email addresses would not be used for any other purpose. Prior to beginning the survey, respondents were required to read and agree to an electronic consent statement that they had voluntarily agreed to participate and were at least 18 years of age. The following items formed a portion of a larger survey unrelated to this study.

Part I of the survey asked about general mobile technology use including the respondent's ownership of a mobile device, the type of devices owned, and if they used mobile applications. If a respondent answered they did not use mobile applications they skipped to the demographic information asked in Part V. Those that answered that they used mobile apps were then asked if they had used MAGart 2.0. Those that answered yes continued to Part II and skipped Part III, those that answered no skipped Part II and answered Part III.

Part II asked respondents to answer statements using a seven-point Likert scale (scale was from 1-7 with 7 indicating strongest agreement with the item) about why they chose to download MAGart 2.0. The first set of statements was related to perceived usefulness of the app and the second set of statements was related to the perceived ease of use of the app. Perceived usefulness statements inquired about specific features of the app, asking respondents if they

downloaded the app because they thought it would be useful in locating works of art, finding amenities such as restrooms, learning more about the artwork, answering general questions about the MAG, taking tours of the collection, and finding alternative ways to look and visit.

Perceived ease of use statements inquired about whether respondents downloaded the app because they thought it would be easy to use, finding what they wanted would be easy, if they thought becoming skillful would be easy, and if they thought it would be enjoyable.

Respondents were asked to answer these statements about reasons why they downloaded the app, not about their subsequent experience with the app.

Part III asked respondents to answer the exact same sets of statements about usefulness and ease of use, except they were asked about what they thought would be useful and what they thought using MAGart 2.0 would be like. In addition, Part III asked respondents to answer statements about behavioral intent: if they intended to use MAGart 2.0 in the near future, if they believed their interest would increase in the near future, and if they intended to use MAGart 2.0 as much as possible. Part III also asked respondents to answer statements using a seven-point Likert scale (scale was from 1-7 with 7 indicating strongest agreement with the item) about why they chose to download MAGart 2.0. Part III included an additional question asking what prevented respondents from using MAGart 2.0, offering multiple choice options (respondents were asked to check all that applied) as well as a write-in “other” option.

Part IV was answered by all respondents who answered yes to using mobile applications and asked questions pertaining to the MAG; this included a question about their frequency of visitation to the MAG over the last 12 months and their engagement with the MAG during these visits. The question regarding MAG engagement gave a list of 13 participatory items such as “read an exhibition label, went on a docent tour, visited the Gallery Store, attended a lecture,”

etc., and asked if respondents had done any of these participatory items in the last 12 months of visiting the MAG. Part V asked demographic information including age, gender, and education.

Parts II and III consisted of a series of scales adapted from prior mobile application TAM research by Kwon et al. (2012) and Verkasaloo et al. (2010) to measure the variables of perceived usefulness and perceived ease of use of mobile applications in a free choice environment. While these scales had been used and tested in earlier studies, they were adapted for MAGart2.0 for this study. For these questions a seven-point Likert scale was used to give a wide range of options to respondents. MAG Engagement in Part IV was adapted from museum experience items from Rey and Casado-Neira (2013) but modified for the MAG. Survey responses were exported and entered on the SPSS Statistics software where the data was analyzed.

Results

Hypothesis 1a

Hypothesis 1a predicted that among non-MAGart 2.0 users there would a positive relationship between perceived ease of use and perceived usefulness. Items comprising the scale for non-MAGart 2.0 users' perceived ease of use was found to be reliable, $\alpha = .949$, as well as for non-MAGart 2.0 users' perceived usefulness, $\alpha = .929$. Composite scale indexes for each variable (non-MAGart 2.0 users' perceived ease of use and non-MAGart 2.0 users' perceived usefulness) were first created. Composite indexes for each variable were calculated for each respondent by taking the mean of respondents' answers to each statement in the scales. A Pearson correlation coefficient was calculated and found a positive relationship, $r(191) = .476, p < .001$, between non-MAGart 2.0 users' perceived ease of use and non-MAGart 2.0 users'

perceived usefulness. H1a was supported; therefore, perceived ease of use was strongly, positively, and significantly related with perceived usefulness among non-MAGart 2.0 users.

Hypothesis 1b

Hypothesis 1b predicted that among MAGart 2.0 users there would a positive relationship between perceived ease of use and perceived usefulness. Items comprising the scale for MAGart 2.0 users' perceived ease of use was found to be reliable, $\alpha = .891$, as well as for MAGart 2.0 users' perceived usefulness, $\alpha = .76$. Composite scale indexes for each variable (MAGart 2.0 users' perceived ease of use and MAGart 2.0 users' perceived usefulness) were first created. Composite indexes for each variable were calculated for each respondent by taking the mean of respondents' answers to each question in the scales. The Pearson correlation found a positive and significant relationship, $r(40) = .316, p < .05$, between MAGart 2.0 users' perceived ease of use and MAGart 2.0 users' perceived usefulness. H1b was supported; therefore, perceived ease of use was strongly, positively, and significantly related with perceived usefulness among MAGart 2.0 users.

Hypothesis 2a

Hypothesis 2a predicted that among non-MAGart 2.0 users there would a positive relationship between perceived usefulness and behavioral intention toward MAGart 2.0. Items comprising the scale for non-MAGart 2.0 users' behavioral intention was found to be reliable, $\alpha = .933$. A composite scale index for the behavioral intention variable was first created. A composite index was calculated for each respondent by taking the mean of respondents' answers to each question in the scales. The Pearson correlation found a positive and significant relationship, $r(191) = .548, p < .001$, between non-MAGart 2.0 users' perceived usefulness and

behavioral intention toward MAGart 2.0. H2a was supported; therefore, perceived usefulness was strongly, positively, and significantly related with behavioral intention toward MAGart 2.0.

Hypothesis 2b

Hypothesis 2b predicted that among non-MAGart 2.0 users there would be a positive relationship between perceived ease of use and behavioral intention toward MAGart 2.0. The Pearson correlation coefficient found a positive and significant relationship, $r(191) = .587, p < .001$, between non-MAGart 2.0 users' perceived ease of use and behavioral intention toward MAGart 2.0. H2b was supported; therefore, perceived ease of use was strongly, positively, and significantly related with behavioral intention toward MAGart 2.0.

Hypothesis 3a

Hypothesis 3a predicted that among MAGart 2.0 users there would be a higher perceived usefulness of MAGart 2.0 than among non-MAGart 2.0 users. An independent-samples *t* test compared the means of perceived usefulness for MAGart 2.0 users and non-MAGart 2.0 users; there was no significant difference, $t(231) = -1.304, p > .05$. The mean perceived usefulness of MAGart 2.0 users was not significantly lower ($m = 5.1587, SD = 1.016$) than the mean perceived usefulness of MAGart 2.0 non-users ($m = 5.45, SD = 1.35$). H3a was not supported; MAG 2.0 users did not differ from MAGart 2.0 non-users on perceived usefulness.

Hypothesis 3b

Hypothesis 3b predicted that among MAGart 2.0 users there would be a higher perceived ease of use of MAGart 2.0 than among non-MAGart 2.0 users. An independent-samples *t* test compared the means of perceived ease of use among MAGart 2.0 users and non-MAGart 2.0 users; there was a significant difference, $t(231) = 2.875, p < .01$. The mean perceived ease of use of MAGart 2.0 users was significantly higher ($m = 5.87, SD = .873$) than the mean perceived

ease of use of MAGart 2.0 non-users ($m = 5.33$, $SD = 1.1$). H3b was supported; there is a higher perceived ease of use among MAGart 2.0 users than among non-MAGart 2.0 users.

Research Question 1a

Research question 1a asked if there was a relationship between non-MAGart 2.0 users' frequency of visitation to the MAG and behavioral intention toward MAGart 2.0. The Pearson correlation coefficient was calculated to test for a relationship between non-MAGart 2.0 users' frequency of visitation to the MAG and behavioral intention toward MAGart 2.0. No significant correlation was found. These findings indicate no statistically significant relationship exists between non-MAGart 2.0 users' frequency of visitation to the MAG and behavioral intention toward MAGart 2.0.

Research Question 1b

Research Question 1b asked if among MAGart 2.0 users there was a higher frequency of visitation to the MAG than among non-MAGart 2.0 users. An independent-samples t test compared frequency of visitation to the MAG among MAGart 2.0 users and non-MAGart 2.0 users and found a significant difference between the means of the two groups, $t(231) = 5.316$, $p < .001$. The mean frequency of visitation of MAGart 2.0 users was significantly higher ($m = 3.525$, $SD = .679$) than the mean frequency of visitation of MAGart 2.0 non-users ($m = 2.668$, $SD = .97$). This indicates that for MAGart 2.0 users there is a higher frequency of visitation to the MAG than for non-MAGart 2.0 users.

Research Question 2a

Research question 2a asked if there was a relationship between non-MAGart 2.0 users' MAG engagement and behavioral intention toward MAGart 2.0. MAG engagement was operationalized by giving each respondent a score based on how many of the 13 engagement

items they participated in during the last twelve months. A higher score meant that the respondent was more engaged. The Pearson correlation was strong and positive, $r(175) = .192, p < .05$, indicating a significant linear relationship between the two variables. This indicates that non-MAGart 2.0 users with greater MAG engagement have higher behavioral intention toward MAGart 2.0.

Research Question 2b

Research Question 2b asks if among MAGart 2.0 users there is higher MAG engagement than among non-MAGart 2.0 users. An independent-samples t test compared MAG engagement for MAGart 2.0 users and non-MAGart 2.0 users and found a significant difference between the means of the two groups, $t(216) = 6.89, p < .001$. The mean engagement of MAGart 2.0 users was significantly higher ($m = 7.675, SD = 2.258$) than the mean engagement of MAGart 2.0 non-users ($m = 5.331, SD = 1.868$). This indicates that for MAGart 2.0 users there is higher MAG engagement than for non-MAGart 2.0 users.

Discussion

This study utilized the technology acceptance model to explain the adoption of MAGart 2.0, the Memorial Art Gallery's mobile application by the MAG audience. Most, but not all of the initial hypotheses were verified for this study. It was found that both users and non-users of MAGart 2.0 had a significant positive relationship between perceived ease of use and perceived usefulness. This indicates true to other TAM findings (Bruner & Kumar, 2005; Davis, 1989; Kwon et al., 2012; Moon & Kim, 2001; Zampou et al., 2012) that both users and non-users who thought MAGart 2.0 would be easy to use also felt that MAGart 2.0 would be useful. The findings showed that there was a stronger, more significant positive correlation between perceived ease of use and perceived usefulness for non-MAGart 2.0 users ($p < .01$) than for users

($p < .05$). It is possible that users, although asked about why they downloaded the app, were influenced by their subsequent use of the app which impacted their responses to the statements. In looking at perceived usefulness and perceived ease of use as factors to predict non-users' behavioral intention to use MAGart 2.0, both variables had a significant positive relationship. These findings indicate that those who thought MAGart 2.0 would be useful and easy to use were more likely to express intent to use MAGart 2.0 in the future. The results for non-MAGart 2.0 perceived ease of use and perceived usefulness as factors for behavioral intention for MAGart 2.0 were equally strongly significant ($p < .001$). There was no significant difference found in comparing MAGart 2.0 users and non-users' perceived usefulness. This indicates that both users and non-users felt similarly that MAGart 2.0 would be useful. However, in looking at perceived ease of use, those that chose to download MAGart 2.0 had a significantly higher perceived ease of use than those who did not download MAGart 2.0. This indicates that users felt significantly more strongly than non-users that MAGart 2.0 would be easy to use, which likely played a role in why they chose to download the app. This does not indicate that non-MAGart 2.0 users felt the app would not be easy to use (the mean of non-users corresponded with "somewhat agree"), but that those that downloaded MAGart 2.0 had significantly higher perceived ease of use. Perceived ease of use is often seen as related to comfort with technology (Kwon et al., 2012; Yang, 2013), which is supported by Lagoudi and Sexton (2010) wanting to offer a more traditional audio tour at the National Gallery for those with less technology experience despite positive feedback about the app. This can also be seen in the study done by Tate Modern and Antenna Audio Ltd. (2003) where the content of the Multimedia Tour was the primary draw (similar to the statements about perceived usefulness which discussed app content) but almost half of users found it difficult to use. MAGart 2.0 users having a significantly higher

ease of use than non-MAGart 2.0 users verify that offering more traditional options may be helpful. This also indicates that while the content is equally as appealing to both users and non-users, ease of use is more likely to detract from adoption of the app. Therefore, having a knowledgeable staff member or a written guide to the app readily available may increase the adoption of the app.

The present study introduced two new variables, frequency of (MAG) visitation and (MAG) engagement, to the technology acceptance model specific to the MAG and museum mobile applications. It was found that there was no significant relationship between non-MAGart 2.0 users' frequency of visitation to the MAG and behavioral intention. This indicates that frequency of visitation does not impact intent to download MAGart 2.0. However, among those who used MAGart 2.0, they visited the MAG more often than those who did not use MAGart 2.0. This falls in line with 87% of non-MAG 2.0 users' response of "I didn't know the MAG had an app" and 21% who responded "I didn't have enough knowledge of MAGart 2.0 and its features" as the top two reasons for not using the app (participants were asked to select all statements that applied). These results confirm the findings of Randi Korn & Associates, Inc. (2006) where most respondents who did not access the mobile tour through their own device of *Matthew Barney: Drawing Restraint* were not aware they could. The significance of frequency of visitation for MAGart 2.0 users could indicate that those who visit more frequently had a greater chance of knowing about the app from the literature at the MAG, seeing the MAGart 2.0 logo next to works featured, or hearing about the app from Admission Desk staff. For the variable of MAG engagement it was found that there was a positive relationship between MAG engagement and non-MAGart 2.0 users' behavioral intention towards the app. This shows that those who participated more actively with the MAG (i.e., reading label text, going on a docent

tour, attending lectures) were more likely to indicate intent to download MAGart 2.0 in the future. It was also found that MAGart 2.0 users had a higher level of engagement with the MAG than non-MAGart 2.0 users. Much like frequency of visitation this indicates the more one already engages with the MAG, the more likely it is that one will engage in other ways available, including using MAGart 2.0.

Limitations and Future Research

One limitation of this study is how the survey was distributed. Having the survey distributed only by email or Facebook already indicates a familiarity with technology. A participant must have the technology knowledge to have an email account and be able to access a web-based survey. If a hard copy of the survey was also distributed at the MAG to visitors and collected it may have captured a wider range of MAG visitors with a broader span of technology experience. For example, 76.5% of survey respondents indicated they used apps. This may have been much lower had the survey also been distributed at the MAG. Another limitation was the age limit of 18 or older on the survey. As shown by Beasley and Conway's (2011) study conducted through the Museum of Science and Industry in Chicago, teens were more likely to own smartphones and the percentage of teens with smartphones is rising faster than adults. It would have been interesting to get the results of this audience as well, as they are the future museum visitors and have a higher level of comfort and knowledge with mobile apps (Beasley & Conway, 2011). Extending the survey to a younger audience, perhaps through their school, would have given a wider range of responses and helped to indicate if a younger audience who are more likely to use apps would be interested in MAGart 2.0. There is also the possibility of survey fatigue as this survey was part of a larger survey and many questions contained multiple statements to rate. There were 68 respondents who began but did not complete the full survey

and therefore their responses could not be included in the results. This could also be related to the relatively low 3% response rate for the survey. Although the survey took approximately ten minutes to complete, it is possible a shorter, more succinct survey would have garnered more responses for a more robust set of data. Another possibility for the low response rate could have been that only one email was sent to those on the MAG email list asking for survey participation. Yang (2013) sent out three emails to receive a 10% response rate.

Future research, in addition to widening and diversifying the responses, could also look into other variables introduced and explored by current TAM research concerning adoption of both mobile technology as well as mobile applications. Both Yang (2013) and Verkasola et al. (2010) looked at behavioral control, from Fishbein and Ajzen's TRA which is defined as "people's perception of the ease or difficulty with which they can perform a certain task" (Verkasola et al., 2010, p. 243). Both studies found that behavioral control predicted the intent to use a mobile app. Verkasola et al. found that technological barriers had negative impact on behavioral control. For the study at the MAG since ease of use was higher for users than non-users, figuring out if that is due to non-users' technological barriers which impacted behavioral control would be helpful. Asking questions specific to use of applications as Kwon et al. (2012) did, such as number of apps and time spent using apps, could help determine if this is a barrier with apps in general, or if it is specific to the MAG app. While the majority of survey respondents indicated they used apps, perhaps downloading a new app and learning how to use it in the course of a visit felt overwhelming which could also be related to technological barriers and behavioral control. It could also indicate a need for the MAG to provide more materials and information on how to use the app prior to download.

Conclusion

Museum communication is expanding yet again, following the rising popularity of the smartphone and similar mobile devices. Portable media allow museums to share a greater amount of content with visitors than ever before by combining audio, video, still images, and text. Previous research showed great promise using mobile technology in museums for enriching content and engaging audiences (Lagoudi & Sexton, 2010; Petrie & Tallon, 2010; Randi Korn & Associates, 2006). However, visitors' adoption of mobile technologies in museums has not been much explored. Several researchers identified the need for research to understand visitor motivations, expectations, and reasons for adoption of mobile technology in museums in order to create better mobile experiences (Rodley, 2011; Smith, 2009; Tallon, 2013). The present study examined the factors influencing adoption of mobile technology in museums through the lens of the technology acceptance model. A case study at the Memorial Art Gallery in Rochester, New York surveyed those on the MAG email list about their perceived usefulness and perceived ease of use of MAGart 2.0, the MAG's mobile app, and how this influenced their use or intent to use mobile technology in museums. In addition, the present study proposed two variables to the TAM specific to the museum environment, frequency of visitation to the MAG and MAG engagement, to understand how these factors influence survey participants' use or intent to use MAGart 2.0. Survey responses confirmed that there were positive relationships between perceived usefulness, perceived ease of use, MAG frequency of visitation, and MAG engagement, and use or intent to use the MAG's mobile application, MAGart 2.0. The study concludes these variables have a significant connection to the actual adoption or the intent to adopt MAGart 2.0. Future research should identify additional variables that influence adoption of

mobile technology in museums to better understanding museum audiences' relationship with mobile experiences in order to build better mobile experiences for visitors.

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Appendix

Memorial Art Gallery Survey

ELECTRONIC CONSENT:

1. Please select your choice below.

Clicking on the "agree" button below indicates that:

* you have read the above information

* you voluntarily agree to participate

* you are at least 18 years of age

If you do not wish to participate in the research study, please decline participation by clicking on the "disagree" button.

- Agree
- Disagree

1. Do you own a mobile device?

- Yes
- No

2. What type of mobile device do you own? (check all that apply)

- Feature Phone (a cell phone without a data plan or access to an app market)
- Smartphone
- Tablet
- iPod or other MP3 player
- Other

3. Can any of your devices download apps from iTunes or Google Play?

- Yes
- No

4. Do you use apps?

- Yes
- No

5. Have you used MAGart 2.0, the MAG's mobile application?

- Yes
- No

PART II

6. I downloaded the MAG's mobile app, MAGart 2.0, because I thought it would be useful for...

Helping me locate works of art/exhibitions I wanted to see

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree

- Disagree
- Strongly Disagree

Finding amenities at the MAG (ie. bathroom, exit, water fountain)

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Helping me learn more about MAG artworks and artists

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Answering general questions I had about the MAG (taking photos, reading labels, etc.)

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Taking tours through the Gallery and/or Sculpture Park

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Finding alternate ways to look and visit (conversation starters, drawing starters, family activities such as I Spy)

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree

- Disagree
- Strongly Disagree

7. Please answer the following statements about why you chose to download MAGart 2.0.

I thought using MAGart 2.0 would be easy

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I thought learning to use MAGart 2.0 would be easy

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I thought finding what I wanted to via MAGart 2.0 would be easy

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I thought becoming skillful at using MAGart 2.0 would be easy

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I thought using MAGart 2.0 would be enjoyable

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree

- Disagree
- Strongly Disagree

PART III

8. With regard to using the MAG's mobile app, MAGart 2.0, it would be useful if:

Using MAG 2.0 helped me locate works of art/exhibitions I wanted to see

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Using MAG 2.0 made it easy to find amenities at the MAG (ie. bathroom, exit, water fountain)

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Using MAG 2.0 helped me learn more about MAG artworks and artists

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Using MAG 2.0 answered general questions I had about the MAG (taking photos, reading labels, etc.)

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Using MAG 2.0 I could take tours through the Gallery and/or Sculpture Park

- Strongly Agree

- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

Using MAG 2.0 helped me find alternate ways to look and visit (conversation starters, drawing starters, family activities such as I Spy)

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

9. Please answer the following statements about what you think using MAGart 2.0 would be like and your intent to use MAGart 2.0 in the future.

I think using MAGart 2.0 would be easy

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I think learning to use MAGart 2.0 would be easy

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I think finding what I want via MAGart 2.0 would be easy

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I think becoming skillful at using MAGart 2.0 would be easy

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I think using MAGart 2.0 would be enjoyable

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I intend to use MAGart 2.0 in the near future

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I believe my interest towards MAGart 2.0 will increase in the future

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

I intend to use MAGart 2.0 as much as possible

- Strongly Agree
- Agree Somewhat
- Agree
- Neither Agree or Disagree
- Somewhat Disagree
- Disagree
- Strongly Disagree

10. What has prevented you from using MAG 2.0? (check all that apply)

- I didn't know the MAG had an app
- I didn't have enough knowledge of MAG 2.0 and its features
- I thought it would distract from my visit
- I didn't know the MAG had wi-fi so I could download MAG 2.0 at the MAG
- I didn't know MAG 2.0 was free
- Using an app in a museum is not appealing
- Other

PART IV

16. How many times have you visited the MAG in the last 12 months?

- Never
- 1 or 2 times
- 3 or 4 times
- 5 or more times

17. While you were at the MAG in the last 12 months did you do any of the following?
(check all that apply)

- Read an exhibition label (artist name, name of work, year of work)
- Read wall text (information beyond exhibition label)
- Looked at a MAG brochure
- Went on a docent led tour
- Used a computer kiosk/interactive part of exhibit
- Used a scavenger hunt
- Took a non-flash photograph
- Used the cell phone tour
- Used MAG 2.0, the MAG's mobile app
- Visited the Gallery Store
- Visited Max's at the Gallery (restaurant)
- Attended a lecture, talk or film
- Visited the Sculpture Park

PART V

18. What is your age?

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65-74
- 75+

19. What is your gender?

- Male
- Female

20. Which best describes your highest level of completed education?

- High school (includes GED, high school equivalent)
- Some college (no degree received)
- 2-year college/ technical school/ associates degree
- College graduate
- Some graduate school
- Graduate degree
- Doctorate degree

21. For eligibility to be entered to win a MAG travel mug, Family membership or Gallery Store Gift Certificate please enter your email address below so we can contact you if you win. This will only be used to contact you to notify you if you have won a prize. Your email address will not be used for any other purpose.

END OF SURVEY