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Mobile Augmented Reality: A Tool for Effective Tourism Interpretation in Enhancing Tourist Experience at Urban Tourism Destination

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ABSTRACT

The formation of tourism experience frequently subjected to complexity of individual tourist psycho-graphical factor, which leads to vast difference in the end experience formed among the respective tourist. However, the fact that travelling is highly subjected to environmental fuzziness and the issue of geographical consciousness may interfere the emotion of tourist and influence the formation of this experience. The evolution and advancement of mobile technologies had been optimized in improving the way human interact with the surrounding environment. Within this context, mobile augmented reality (AR) technology is perceived as capable in narrowing the gap between the formation of pleasant experience and the issue of geographical consciousness, thus transform the way tourist interact with the destination. Pertaining to this situation, this conceptual paper is attempted to understand the effectiveness of mobile augmented reality in enhancing tourist travel experience on the tourism destination. In relation to this aim, this study is directed to clarify the mechanism and usability of mobile augmented reality in relation to its capability in improving tourism interpretation and to discover the influence of utilization of this technology towards tourism experience. Critical review of existing literature that relevant to the research area was done in understanding on the extensiveness of impact of mobile AR on tourist and experience formation. Findings revealed the capability of AR in merging virtual information with the real world environment through the platform of mobile device able to create a more dynamic interaction between tourist and surrounding environment.

1. Introduction

Mobile technology advancement and the existence of wireless network technology have simultaneously stimulated the expansion of function and significance of mobile related-device in human daily life these days. As tourism is very much associated with spatial encounters and the issue of tourist geographical consciousness, the application of mobile technological advancement in this area is being seen as able to ease tourist travel movement to their destination and Point of Interest (PoI) throughout their trip (Brown and Chalmers, 2003; Tussyadiah and Zach, 2011). Although there is a vast options of location-based services (LBS) mobile application has been made available to navigate and direct the movement of traveller, tourist however tend to desired a more dynamic and interactive experience in using technological application during their trip (Kounavis et al., 2012). In relation to that, the emergence of augmented reality application in mobile devices is perceived as an effective tool to assist tourist travel journey and simultaneously improving their experience on the destination.

Augmented reality have the capability to integrate the virtual environment with the real-time objects in enhancing the environment of its user or domain (Höllerer and Feiner, 2004; Linaza et al., 2012). With the presence of AR application in mobile device, user thus able to experience more excitement during their trip as they being made accessible to real time online information, such as navigation of places and social media network, computer-generated data, including videos and graphics, that being integrated and overlaid on top of the real-world view (Kounavis et al., 2012). The adding of layers of information oriented by location-based service that takes the domain real physical environment as its backdrop, instead of replacing it with virtual artificial environment made mobile AR to be more interactive in comparison to the other Location Based Services (LBS). By compacting all of these online and offline information into mobile device, primarily through the application of Augmented reality in mobile technology, it would thus allow tourist to encounter a more dynamic and interactive travel experience through a better accessibility of information and interpretation of the tourism destination and the related PoI.

In relation to above, this paper outlines the conceptual overview of the possibilities on the application of mobile AR as a tool to enhance tourist experience especially at the urban tourism destination. The main direction of this study in general is to understand the effect of mobile augmented reality in enhancing tourist travel experience through improvement of tourism interpretation. Consequently, several objectives has been identified to support the research goal, which are to study the mechanism and usability of mobile augmented reality in relation to its capability in improving tourism interpretation and information delivery and to identify the effect of mobile augmented

reality in discovering the influence of its utilisation towards tourism experience.

2. Mobile Technology in Tourism Industry and Augmented Reality

2.1 Mobile Phone as Tourism Tool

Technological advancement has undoubtedly created changes to the entire living environment of human population. Human dependency on technologically-related systems and equipment has undergone a vast growth not only in the field of business and economic development, but also competitively important in the other industries, including tourism, especially in the last few decades. Porter (2001) indicated that huge changes in the practice and strategy of business and other industries are resulted from the rapid development of information communication and technologies (ICTs). In relation to that, the development of ICT is being seen as an extremely powerful tools for the enhancement of business and industrial operation system (Porter, 2001).

The increasing advancement of mobile technology had been seen as one of the push factor to the expending functions of the mobile devices nowadays. The evolution of mobile phone in becoming one of the basic human needs had slowly occur and currently had become more prominent, in conjunction with the raising importance of internet through the presence of wireless network. Both of these situations had made the application of m-commerce to be possible and concurrently upgrading the use of mobile phone to another level (Kim, Park and Morrison, 2008). Instead of operating as communication device, web browsing had seemed to be one of the most important uses of mobile phone in the current era and thus undoubtedly made business and information accessibility to be more user-friendly than ever (Kim, Park and Morrison, 2008; Schmiedl, Seidl and Temper, 2009).

Focusing on tourism industry, the impact of hasty advancement of ICTs towards tourism as a whole is no more a recent phenomenon. Although practically, ICTs related matter has started to conquer the global development in the recent decades through the expanding innovation and advancement of mobile technology, this matter had become one of the major concerns in this industry since 1980's, through the emergence of application and solution that being termed as 'eTourism' (Buhalis, Leung and Law, 2011). The expansion in the function of mobile phone had seemed to alter the social use of this device. The extensiveness of the influence resulted from its expending function had able to modify the method of interpersonal communication, re-define the possible limits of communication, re-outline the operating system of institution etc. (Fortunati, 2002). Tourism industry had received the similar impact, especially with the tipping desire of consumer on m-commerce. With the foreseeable business potential of m-commerce, especially through the presence of more convincing market opportunities, the use of mobile information system had been highly accepted by the service providers within tourism industry (Kim, Park and Morrison, 2008). Due to that reason, the effective application of mobile technologies can be obviously seen on tourism-related matters (Brown and Chalmers, 2003).

With the development of 'smart phone' in the later stage, the reliance of travellers on ICT had continuously multiplied, and this situation had been made obvious through the rising of the perception that mobile phone as an important tool in executing tourism related activities. This was agreed by Buhalis (as cited by Buhalis, Leung and Law, 2011) as he indicated that tourist had undergone evolution as they became more independent and sophisticated, which can be seen through the use of various tool for their travel arrangement, including the use of smart phone. ICT in overall had facilitated tourist pre, on and post travel preparation with the easy access of information regarding the destination and the travel journey. Although the dependency on printed travel guide can still be seen, especially among senior travellers, it is still can not be denied that in the current digital era, the use of mobile technology in accessing to travel information had aggressively replacing this conventional method (Buhalis, Leung and Law, 2011). Due to that, travelling nowadays is thus being made to be more handy by eliminating the use of maps and tourist guidebooks, which at a certain point may not be fully effective in clarifying the fuzziness of tourist upon their arrival in new places (Brown and Chalmers, 2003).

2.2 Mobile AR and Its Technological Requirement

The vast capabilities of Augmented Reality had made this technology to be increasingly significant in various fields. Augmented Reality itself is referred as a technique of visualisation that enable the overlaying of various types of computer-generated data, either in the form of text, audio, video, GPS data or other media formats on top of the physical world view, through the use of specific devices (Kounavis et al., 2012). The augmenting of computer-generated data on real-world view is primarily for the purpose of enhancing the user or the domain's understanding on the subject matter in the physical environment. Augmented Reality which fall under the category of mixed reality is indirectly creating a dynamic and interactive delivery of information through the co-existence of real and virtual environment within a digital information (Azuma et al., 2001; Marimon et al., 2010). Focusing on mobile augmented reality, the centre of attention is on the application of mobile device as the main platform, such as smart phones, in executing the similar capability to ease the use of this visualisation technique on the go (Figure 1).

AR application had been able to develop rapidly within these years mainly due to the recent advances in mobile related-technology (Linaza et al., 2012; Yovcheva, Buhalis and Gatzidis, 2012). This can be clearly visible through the increasing numbers of consumer-based mobile AR application that can be easily obtained from online mobile application store such as Google Play and Apps Store. Looking into the open access of this technology, there seems to be several technological requirements that need to be strictly adhered to ensure the optimisation of mobile AR capabilities in enhancing the domain's interaction with his physical environment. In relation to that, enabling technologies play an extremely important role in determining the appropriate functionalities of AR (Refer to Figure 2).

The enabling technologies for AR as indicated by Azuma et al. (2001) include the displays, tracking, registration and calibration systems. Rabbi et al. (2013) from another perspective perceived these as

Figure 1 *Reality-Virtuality Continuum by Milgram et al. (1994; as cited by Azuma et al., 2001).*

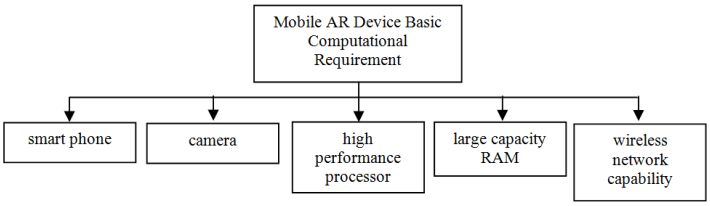

Figure 2 *Mobile AR device basic computational requirement (adopted from Kounavis et al., 2012 and Tokusho and Feiner, 2009)*

challenges to be overcome in effectively operating AR. Since mobile AR suggesting the use of mobile phone as the most suitable platform, there is not much concern on the AR display. However, major emphasis to be placed on the tracking system and calibration system used in performing AR capabilities. The identification of users' location and position in generating digital information of the physical environment requires the AR mobile device to be equipped with several tracking systems, such as global positioning system (GPS) and indoor positioning system (especially gyroscope and accelerometers) (Azuma et al. 2001; Kounavis et al., 2012). These technological requirements are crucial in registering the characteristics of physical objects and aligning it with the virtual information that to be augmented (Azuma, 1997; Höllerer and Feiner, 2004; Rabbi et al., 2013). Simultaneously, extensive calibration capabilities are also required within the device in ensuring the registration of digital information with a certain level of accuracy. Furthermore, as some of the virtual information is in real-time basis, the operation of the overall mobile AR systems entails the wireless connection of internet (Höllerer and Feiner, 2004; Kounavis et al., 2012). Thus, to simplify, the mobile phone that highly suitable to be used as mobile AR hand-held device need to be smart phones with camera application, high performance processor, large capacity memory and wireless network capabilities to ensure it compatible and capable enough in optimising AR functionalities (Kounavis et al., 2012; Tokusho and Feiner, 2009).

3. Evolution of Tourism Experience

3.1 Psychology of Tourist Experience

Tourist experience is mainly the formation of knowledge and understanding of a destination and the entire trip made on a vacation. While tourism itself is more on the encounters of the individual tourist with peoples and physical environment at their visiting places, the formation of experiences are actually the accumulation of psychological reflect of the interaction made between the tourist and his surroundings. Crouch (as cited by Tussyadiah and Zach, 2011) clarified that the encounters made by tourist "is essentially the process of making meaning of spaces and cultures". Tussyadiah and Zach (2011) further explained that the interaction of tourist with the people and environment are somehow contextualised by the sensual quality and geographical features of the destination, which influence the different level of experience form within the tourists' mind. Despite the luxurious accommodation and fascinating vistas, the "interaction" made by the tourist throughout their trip is actually perceived to be the core and the fundamental elements in the formation of tourism experience (Larsen, 2007).

The tourism experience is more than the tangible part of a trip, such as the PoIs and the activities. It is however involving the intangible elements encountered by the tourist, including the individual tourist psychological aspects. Larsen (2007) agreed that tourism experience is to be considered as psychological phenomenon, and its formation may differ from one tourist to another. The psychological process undergone by a tourist in developing the experience tend to be influence by both internal factor, such as their mind set and preference, and external factors which is the tourist environment. Volo (2009) justified that one of the difficulties in encountering with the complexity of tourist experience is "defining how it changes according to the characteristics of the individual tourists" (pp. 114). The complexity in the formation of tourism experience due to the influence of psychological aspects tend to make it highly changeable as well as difficult to be identified and measured.

In depth review on tourism experience illustrated that the connection between tourists and the surrounding physical and social environment does not end at the point of their interaction, in fact it is extended to the feeling and emotion of tourists towards the destination. Williams and Vaske (2003) suggested that place attachment happens to tourists towards the recreational places or tourism destination, which one of it is in the form of emotional attachment. In relation to this form of attachment, Larsen (2007) highly stressed that the tourists' moment of consciousness and their immediate participation to a specific situation, as well as the accumulation of experience on a particular subject on a period of time are among the concerns of tourist experience. This was agreed by Mossberg (2007) as he stated that tourist actually consume experience throughout their journey and it involve the constant flow of though during their moment of consciousness.

As tourist experience covering a certain time period, its formation can be said as involving several phases or stages. Cole and Scott (2004, as cited by Volo, 2009) proposed tourism experience into four stages, which are "dimension of performance quality, dimension of experience quality, overall satisfaction, and revisit intention" (pp. 114). Almost similar with Cole and Scott, Larsen (2007) indicated the elements of tourist experience comprise of initial expectation, perception during visitation and memory of the trip. Focusing on the perception, Larsen described it as made up through the stimulation of senses that process the information and form the way a tourist interpret the destination. Considering the stages of tourist experience by these authors, it visualised the important of senses stimulation in experience formation and this is justified by Tussyadiah and Zach (2011) as they stated that tourist experience "…takes form in different dimension of sensory, cognition and perception, social, and affective/emotion…" (pp. 281). In deed the psychological process of experience tends to be complex and hardly understandable, it is somehow a potential from another point of perspective. The psychological aspects of experience formation is perceived to be easily manipulated and can be influenced through various means in developing the emotional attachment between the tourist and the destination. The use of technology at a certain point may create a different form of stimulation to the tourist and made the destination to be viewed from another angle.

3.2 Influence of Mobile Technology on Tourism Experience

Mobile technology has significantly influencing the tourism industry in various perspectives. The late 1990's and early 2000's visualised the functioning of mobile technology being prioritised for the purpose of delivering relevant information regarding tourism destination with the concurrent use of wireless internet services. Brown and Chalmers (2003) indicated other than accessing to information, the early use of mobile technology in this industry also concentrating on several other aspects, such as sharing tourists' visit information either for coordination

within the pack or sharing views with other tourist, navigation and guiding of destination, and assisting pre and post visiting preparation. In relation to the functioning of mobile technology for guiding purposes, it is aware by all that travelling is highly subjected to new environment with fuzziness in terms of spatial location and navigation to PoIs. This is also stated by Tussyadiah and Zach (2011) that tourism is very much associated with spatial encounters and the issue of tourist geographical consciousness. Pertaining to this matter, mobile technological application, such as location-based services, is perceived to be extremely useful to ease the movement of tourists, not only to clarify the spatial fuzziness, but also to eliminate the use of non handy maps and tourist guidebook.

Travelling is highly spatiotemporal in nature, and optimising the use of tourists' time during the vacation is extremely important in creating meaningful and memorable experience of the destination. Spatial navigation capability alone does not effectively manipulating the spatiotemporal limitation of travelling to fit with the in depth exploitation of tourists surrounding. As experience is highly psychological in character, tourists tend to desire for more interactive social and space encounters through the use of technology. This is agreed by Kounavis et al. (2012) and Linaza et al. (2012) as they indicated that dynamic interaction with PoIs and ability to share travel experience with families and friends through social network are among the important parts in meeting tourist desire and satisfaction in relation to their experience. Although some may questioned the social acceptability on the increasing density of the mobile technology and the possible issue of users reservation in operating the new and complex system, the improvement is worthwhile with the enhancement that to be made on tourist experience. Andersson et al. (2006) justified that the increasing complexity of mobile technology through the adding of new functionalities is sufficient to be overcome by ensuring users continue to value the experience. Pertaining to this demand, several other capabilities had been adapted in mobile technological device, and mobile Augmented Reality is one of it.

Instead of shifting from one functionality to another, tourists actually requiring the simultaneous use of several different functionalities within one application. As AR generated content able to provide dynamic tourist-destination encounters, the upgrading of its capabilities in meeting tourist diverse interest, improving their geographical consciousness and obtaining in depth interpretation of destination, able to assure more insight to tourist experience. Yovcheva, Buhalis and Gatzidis (2012) in their review on numbers of AR applications had outlined several important functionalities that perceived to be able in adding value to the user experience (Table 1). Considering all of the important functionalities stated by Yovcheva, Buhalis and Gatzidis, seamless travel with the dynamic tourist-destination encounters and effective tourism interpretation is highly possible to be obtained in mobile AR technology. As experience formation highly affected by the tourist perception towards their surrounding, computer-mediated interaction that take place in interpreting the destination through the use of mobile AR would psychologically affect impression formation of tourist, which possible in making the destination to be perceived as more attractive than its usual form. Pertaining to all the area of concern mentioned, Figure 3 summarised the relationship between tourist, experience formation and the needs for various functionalities of mobile technology. Consequently, extensiveness of the mobile AR in influencing tourist experience is yet to be proven and the evaluation of its impact is crucial for further understanding.

4. Methodology

4.1 Methods for Analysing Literature

As this paper is only at the conceptual stage, the analysis done in this paper was depending on the critical review of existing literature that is relevant to the subject area. In relation to that, the data was mainly depending on secondary sources extracted from scholarly documents

Table 1 *Selected criteria of mobile AR application by Yovcheva, Buhalis and Gatzidis (2012)*

No	Functionality	Description
1	Search and Browse	Search and browsing (categorical search) mechanism provides access to relevant information (Rasinger et al., 2009).
2	Context-aware push	The tourist may miss out on important/interesting information, especially in information-rich urban settings (Raisnger et al., 2009).
3	m-Commerce	The possibility for booking/reservation and payment (Rasinger et al., 2009).
4	Feedback	A mechanism to provide and/or receive feedback from/to other tourists or tourism authorities (Rasinger et al., 2009).
5	Routing and navigation	The possibility to obtain directions and navigation to a POI, once it is visualized in AR view and selected (Umlauft et al., 2003).
6	Tour generation	Adding POIs to a (pre-generated) itinerary allows tourists to plan better and manage their leisure experience (Umlauft et al., 2003).
7	Map services	Helps tourists to obtain an overview of a larger territory (Suh et al., 2010).
8	Communication	Option to realize direct contact with accommodation providers, exhibition owners and others involved in service provision (Rasinger et al., 2009).
9	Exploration of Visible surroundings	Apart from looking up for information about a particular item, place, object and category, tourists may wish to "explore" available information about their surroundings without pre-defined criteria (Ajanki et al., 2010).
10	Interactive AR view	A "clickable" AR view could serve as an interface to additional, more detailed information about a point of interest (Wither et al., 2009).
11	Filtering of AR content	The option to filter and change interactively the visualized content in AR view. This is an important feature, keeping in mind that urban environments are rich in potential targets for annotation (Tokusho and Feiner, 2009)

such as article journals, conference proceedings, reference books etc. Documents that discussing on several areas were put into attention in gaining ample data and information pertaining to the research direction. Those areas include information and communication technology, mobile technology, Augmented Reality, tourism experience and tourism services.

At the analysis stage, content analysis technique was employed in extracting the related information and authors' views on the research area. In evaluating the effectiveness of mobile AR in improving tourism interpretation at tourism destination, findings and discussion done by authors' from the existing literature were extracted and compared to gain understanding on the extensiveness of impact of mobile AR on tourist experience. Discussion was later made by correlating the findings gained with the reviewed research framework that had been done in the earlier stage.

4.2 Methods for Further Research

4.2.1 Requirement for the Selection of Study Area

Further research on this subject area requires the employment of several data collection and analysis techniques in effectively extracting the influence of mobile AR on tourist experience through the improvement of tourism interpretation at tourism destination. Prior to that, review of the existing literature on the selection of study area reveals urban tourism destination as the most appropriate area in implementing this research. Ismail and Baum (2006) justified that town and cities is commonly considered as a must visit place for either international or domestic tourist during the travel journey, mainly due its functions and extensiveness of its facilities and infrastructure. As tourists visitation to cities and towns are associated to wide range of motivation, complexity of the area and various options of PoIs, in comparison to the other tourism destination, would made the use of mobile AR in this area to be more significant, either for the purpose of navigation, interpretation, or information provision. The facts on the complexity of urban tourism is agreed by European Commission (2000) and Ismail and Baum (2006), as they indicated that the size, the history, the function, the environment, the image, etc. are among the factors that create the complexness of this place in becoming a tourism destination. Consequently, Tokusho and Feiner (2009) and Yovcheva, Buhalis and Gatzidis (2012) suggesting the use of mobile AR to be prioritised on urban environment instead of other geographical area.

4.2.2 Data Collection Methods and Tools

In obtaining the gist of the impact of mobile AR utilization on tourist, the changes in tourist perception on the urban tourism destination before and after using mobile AR are to be captured. In relation to this matter, the use of formative evaluation might be appropriate, since it is mainly employed to evaluate the existing mechanism of a product for better improvement of its functionalities to suit the user's needs (Burns, 2008; Linaza et al., 2012). In consequence to the formative evaluation that to be implemented, Linaza et al. further suggested the adoption of quantitative primary data collection approach by using questionnaire as the main data collection tool in gathering the information on the tourist perception on urban tourism destination. As the concern of this research is to evaluate the extensiveness of the changes in tourist perception before and after using mobile AR, before and after survey is to be employed in attaining this crucial information.

In complementing the execution of before and after quantitative survey, the development of validation scenario is to be done on selected urban tourism destination. This is in order to support the field trial of mobile AR application for the selected respondents to undergone experimental session of this technology (Linaza et al., 2012; Marimon et al., 2010). Specifically for further work of this research, it is suggested that the experimental session to be executed in between the implementation of before and after survey to assure the respondents encounter some degree of changes in their perception on the urban tourism destination.

4.2.3 Validation Scenario

The development of validation scenario for the selected urban tourism destination requires the initial selection of mobile AR application that to be used throughout the research execution. Considering the functionalities and the state of art of several applications, Junaio Augmented Reality Browser is proposed as the most suitable tool to be used for the evaluation of tourist experience. Junaio possesses various tracking technologies that enable it to perform various functionalities, including navigation and information sharing for various categories and multimedia format of information. In addition, Madden (2011) indicated that Junaio offers advance tracking technology, especially environmental tracking capability, which thus makes it to be more feasible to improve the interpretation of urban tourism destination.

In relation to the development of validation scenario through the use of this AR browser, a numbers of relevant and significant Point of Interests (PoI) within the urban tourism destination need to be selected. Additionally, the selection of pertinent multimedia content for the PoIs that capable in improving the experience of tourist is to be done in creating the augmented virtual information of the overall tourism destination (Marimon et al., 2010). In continuation to this, geo-location data of the PoIs and the selected digital information will be used in creating Junaio PoI Channel by using Metaio PoI Creator plug-in. The information regarding the channel created will be generated in the form of QR-code and it is to be scanned using the Junaio browser in the mobile device, for the purpose of inserting the channel into the device.

5. Findings from Literature

5.1 Usability of Mobile AR for Guiding and Interpretation Purposes

In general, findings from review of existing literatures illustrated that mobile AR was usable for the purpose of tourism guiding and interpretation. A research done by Linaza et al. (2012) on mobile AR application for tourism destination demonstrated that 20 percent of their respondents indicated that 3D visualization features of mobile AR to be usable in visualizing the PoIs. Another finding from the same research identified that from the question of "Have you been able to interact with 3D icons of each PoIs?", 53 percent of the respondents had answered that it was quite easy for them to interact and 27 percent able to interact perfectly, while only 13 percent and 7 percent perceived it to be quite difficult and could not interact at all. The similar situation encountered by Wagner et al. (2005) in their research on the use of AR on hand-held device, focusing on PDAs, as they observed that the younger generation and the computer system professionals tend to be

easily grasp the concept of the application and outperformed it in comparison to the other group.

The semi-structured interview executed by Linaza et al. on their respondents after the questionnaire survey disclosed that the inability of some respondents in interacting with the 3D icons of the PoIs was mainly due to "the lack of experience in using the Android operating system", which indirectly preventing them from exploring the different functionalities of this mobile application. Azuma et al. (2001) indicated this situation as one of the challenge in using AR as social acceptance and adaptability towards the use and functionality of this unfamiliar system would create limitations on the optimum application of mobile AR technology. However, the level of public exposure and knowledge on the technology and application was somehow not the main obstacle in effectively utilising the mobile AR as Wagner et al. found out from their research that the visitors that testing this technology had almost no reservation and hesitation in using and exploring the system. In fact, they just simply explore it through trial and error, and finally figured out ways to operate the system. Marimon et al. (2010) at the same time justified that the important aspects of employment of mobile AR was to deploy it on a device that are common and familiar by its potential user. The functioning system and the user interface are commonly user friendly mainly to ensure the ability of its potential user to effectively interact and appreciate the tourism destination instead of encountering technical difficulties in operating it. Thus, either the age factor or level of exposure on computer system of an individual does not significantly limit the applicability of mobile AR to enhance tourism interpretation.

5.2 Improvement of Tourism Interpretation through Mobile AR

In relation to the ability of the technology to improve interaction with the destination, Wagner et al. identified that the use of this mobile technology not only able to enhance the interpretation of the environment, but it at the same time improve the interaction among the users. The authors during their observation seen that the users tend to pass around the device and explain to each other on the digital information that appeared on the screen of the device in relation to the environment. This situation thus visualized the excitement of the users on the capability of the technology, which being translated through the sharing of information and understanding among each other.

Further evaluation on the effectiveness of mobile AR in guiding and interpreting tourism destination by Linaza et al. (2012) shown that the mobile AR technology was highly successful in arousing the interest of its user either on the AR system or the destination. All of the respondents displayed high interest on the virtual content of the destination, in which 67 percent of them indicated it to be "very interesting", 33 percent indicated "quite interesting", and neither of them answered "not interesting at all" nor "scarcely interesting". The respondents also perceived that ordinary and common monuments and building within the cities to be the more attractive through the use of mobile AR. These findings are in line with Kounavis et al. (2012) statement as they indicated that AR-enhanced context capable in manipulating the situation and making the information to be more interactive through the use of virtual information. The technology was also perceived as able to improve tourists' interest on the visiting places and capable in influencing further exploration on the destination, as it allow them to view the place from another perspective (Fritz, Susperregui and Linaza, 2005).

In relation to its significance in urban tourism destination, Linaza et al. also identified that 93 percent of their respondents would use this mobile technology as a guide in the other cities. This directly illustrated the importance of mobile AR technology in assisting visitors and tourists' movement within urban areas. Yovcheva, Buhalis and Gatzidis (2012) agreed to this finding as they indicated that one of the criteria for application of AR on smartphone was to delivered content of a city related to urban leisure experiences. In relation to this, European Commission (2000) also stated the nature of urban tourism is complex mainly due to the factors such as the size, the history, the morphology, the location the image etc., and this simultaneously means that the application of mobile AR in urban tourism destination would be highly significant in comparison to the other tourism destination. These findings thus illustrated that mobile AR technology is extremely useful in improving the understanding of its user, facilitate their movement as well as enhance the attractiveness of an urban tourism destination.

5. Conclusion and Recommendation

The development of mobile technology in the last few decades had highly evolved the way tourists communicate and interact with their surrounding environment. The increasing dependency of human towards mobile phone and the complexity of formation of tourism experience have somehow created a demand for a more interactive encounter of tourism destination through the use of technological application. The presence of mobile Augmented Reality (AR) technology is perceived as able to narrow the gap between the need for better interpretation and meeting the experiences desired by tourist, especially with the increasing complexity of human computer interaction (HCI) experienced nowadays. The merging of virtual information with the real world environment through the platform of mobile device able to made possible a more dynamic interaction between tourist and their environment. Thus, there is huge potential for mobile AR to be use as a medium for effective tourism interpretation and enhancement of tourism experience. Acknowledging the vast capability of mobile AR, this conceptual paper thus present the influence of this technology in improving tourism experience.

Critical review of the existing literatures illustrated that regardless of the complexity of its state of art, mobile AR somehow is highly usable despite the age structure and the level of technological consciousness of the user. The primary deployment of this technology on device that is extremely familiar by its user had thus overcome the challenge of social adaptability and made it applicable in enhancing tourism interpretation. Further analysis on several other literatures revealed that the use of mobile AR technology is capable in enhancing the interpretation of the tourism destination. The augmented virtual information is successful in manipulating the situation and making the tourist surrounding environment to be way more interesting. Tourists tend to be psychologically influenced by the use of technology in interpreting the destination and caused them to perceive it to be more attractive than its usual form. In addition, it is identified that the use of mobile AR in urban tourism destinations are highly significant in comparison to the other destination due to the nature of their environment that are much more complex in several aspects. The presence of extensive infrastructure and facilities as well as the compactness of the area would thus made the use of mobile AR to be more useful either for the purpose of navigation, interpretation, or information provision.

Mobile AR technology is perceived to have a huge potential in tourism industry, especially in improving the interaction between tourists and their environment. Further research on this topic suggest the employment of before and after survey to effectively evaluate the changes in perception of tourists on the destination after utilizing mobile AR. Secondly, a proper filtration of the digital information to be inserted in the validation scenario is extremely important in ensuring significant level of changes in tourists' perception towards the environment. Both of these steps are highly recommended to be employed for the purpose of ensuring the validity and reliability of the evaluation made in identifying the effectiveness of the technology towards the improvement of the overall tourism experience.

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