

# Exploring Tourist Requirement in Using Augmented Reality Products in Tourism Experience

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## Abstract

**This paper aims to explore the tourist requirement in using Augmented reality products in tourism. A qualitative research approach is applied in the present study. The coding process followed grounded theory, and the results of this paper indicate the convenience, interaction and privacy play an important role in tourists' requirements in Augmented reality tourism.**

## Keywords

**Tourist requirement; Augmented Reality; Grounded theory.**

## 1. INTRODUCTION

In recent years, Information technology (IT) in tourism has been conducted for many years, especially in the mobile application of tourism (Chung et al., 2018). For example, AR technology is blurring the links between the real and virtual world (Lee et al., 2018). Besides, Information technology (IT) is revolutionizing the developments of products and services (Guttentag & Smith, 2017). AR technology, as the typical representative of information communication technology, owns broad research values. Before acknowledging the AR definition, we need to acknowledge the Virtual Reality. VR is another information technology called Virtual Reality and can immerse customer enjoyment in the virtual or called artificial environment. It provides the environments including vision, sound and touch, which can be changed by the stored photos, haptic devices and exoskeletons. Through the experience in an artificial environment, the user could feel the virtual environment. Meanwhile, through the VR machine to trick people's minds in an instant (Kong et al., 2017). From this perspective, VR technologies more focus on virtual experience and lack real feelings. Compared to VR technologies. AR technology is a real-time technology that could enable users to perceive the more real and virtual experience of augmenting computer-generated objects (Azuma, 1997). Due to VR technologies only generate a virtual environment, and AR technologies will improve this point that it can utilize the existing real-life environment and cover new virtual data over the VR technologies.

It is not clear what requirements are acceptable for AR applications in tourism, and little research has been done on user requirements? It is, therefore, necessary to explore the relationship between AR and user requirements, given that AR plays a vital role in tourism, making it essential for managers to design and understand user requirements in current mobile AR applications. Future research should concentrate on how to establish an effective and beneficial method for converting personal requirements into a particular application to enhance the satisfaction of tourists. Therefore, the goal of this paper is to examine the needs of tourists by using Augmented Reality products in the tourism field.

## 2. LITERATURE REVIEW

### 2.1. Definition of Augmented Reality

AR technologies have been researched and applied in different industries such as medical, sport, and tourism industries. Meanwhile, the applications of products have gained increasing interest in similar industries (Nicas, 2016). Liao (2019) argued AR as an advanced information technology which can integrate digital information through stored live videos to enrich the customer's experience. AR development has experienced many modifications concerning its contexts and research implementations (Krevelen & Poelman, 2010). Meanwhile, information technologies were applied by some top corporations such as Google, Marriott, etc. Similar tourism markets have begun to bring in many facilities to use relevant settings. Such as interactive functions of information technologies have been conducted in promoting the virtual experience which could attract more shoppers and tourists to enjoy the information technologies when they use the AR products such as wearable AR glass (Huang & Liao, 2015). Prior literature thought AR as the respect of information technology owing to potential value and has not been explored by similar articles. In relevant researches, AR technologies have existed for many years and have been applied in several industries. Until now, it has been widely and highly discussed and debated as part of advanced information technologies. Meanwhile, some tourism industries considering AR technologies could benefit as the new promotion tools to enhance the corporation's competence. However, how to precisely find the customer requirements of AR products is also a big challenge.

Therefore, the exploration of AR technology also has enough potential abilities to develop. Relevant studies have given the definition of AR, which it can connect and conclude conjunction between virtual and real environment, and also can strengthen immediate surroundings between the real and virtual environment.

### 2.2. Augmented Reality in Tourism

Augmented reality in tourism has been a new debate in recent years (Alvarez et al., 2012). They thought AR technologies could through overlying the virtual environment to help tourists the objects both in virtual and real feelings while they in travel. AR, through providing 2D/3D images, models, sound, touch, and technologies support can make the tourists feel the depth experience (Hariharan et al., 2020). The early studies about AR technologies in tourism such as some functions like GPS-based, IQ scanning can be used in tourism (Feiner et al., 1997). These functionalists enrich tourism methods and not only limited to traditional tourism. Besides that, AR also supports tourists enable the virtual world such as dreamed destination, dreamed girls or boys translate into the real world become the possibilities (Nicas, 2016). Amount enterprises have ventured these AR technologies into productions such as AR glasses, AR games and AR maps (Huang and Liao 2015; Hariharan et al., 2015). These procedures can stimulate the development of heritage tourism and attract more potential tourists who are interested in advanced technologies. Tourism industry seems to be the best choice for augmented reality application, (tom Dieck & Jung, 2017) proposed a new model to incorporate the AR factors including quality, risks, and other some factors which can help tourism managers more set the strategical planning to bring in AR equipment to the heritage tourism. Some studies have proved scientific AR model can help managers attract the tourists and control risks (Huang & Liao, 2015).

### 3. RESEARCH METHOD

#### 3.1. Research Design

This study aims to explore tourist requirements in AR tourism. Therefore, in this aspect, using the qualitative method is suitable for a full understanding of this study, which will induce the categories based on data and provide the conceptual model base on the qualitative results (Patton, 2005). The conceptual model came from experts and tourists who have abundant experience in AR tourism. The data were derived from online and offline depth semi-structured interview. This paper followed the grounded theory qualitative method, a theoretical sampling strategy will be applied in this study research.

#### 3.2. Research Sampling

The main research data came from an online and offline semi-structured interview with experts and visitors. And this data collection process primarily separates the two aspects of online data collection and offline data collection. To collect and obtain more knowledge and explore possible useful data from the respondents, we prepare the exact questions and continuously change the questions depending on the responses of the interviewees, which is a semi-structured interview instead of a rigid question. This study used random sampling. Guest, Bunce, and Johnson (2006) argued that for qualitative studies, a good sample size can limit bias and validity threats. Properly used, small samples are rich enough to provide effective, diverse, and meaningful patterns. (Tongco, 2007). Therefore, we interviewed 34 participants who met the required criteria.

#### 3.3. Data Analysis

To prove and ensure the credibility of these data, several techniques were used to decrease the possible bias and some mistakes. The AR site will be photographed and recorded in research, and the interviewees' answers will be recorded and translated. The results of interviewees derived from grounded analysis are provided in the research results section, with verbatim quotes from the interviews.

The interview data will make the interviewees reconfirm their answers during the interview. The expert interviewee answers will help interviewers judge the answers of tourists' credibility. The data analysis follows the inductive approach, and this aim of the study is to create the conceptual model of tourist requirements. The computer software of Nvivo12 was amply applied in the qualitative data dealing and induce the categories. To compare and code the data, the computer software for qualitative research tool Nvivo12 was applied in this data analysis of this study.

### 4. RESULTS

This study all interviewed 7 experts and 27 tourists. This interview includes 14 males and 20 females. Over 50% of respondents own higher than 5000RMB income, and over 85% of respondents have degrees over a college degree. And the age group includes 18 years old to 50 years old, and we found most participants who experienced AR products focus on 18-25 years, which represent young people are the primary consumer market. Within the analysis, participants were coded like EP(X) represents expert participants, such as the first expert participant will be showed in EP1, in the same way, TP(X) means the number of tourist participant like first tourists will show in TP1.

#### 4.1. Convenience

Adding convenience in Augmented Reality is an essential point for tourists' requirements in tourism, for tourists in tourism, the requirements of convenience is crucial and indispensable.

The first aspect for tourists, they thought owing to the function in convenience can help tourists save time and improve the efficiency in tourism. They all thought that if the AR goods are easy and compact, they will improve satisfaction.

EP2: If you use the phone as a medium, you have to hold the phone then up and look around, it has to say then identify something as an anchor point, and then its program will pop out, right? In that case, and then it's relatively restrictive, operation maybe a little bit. Therefore, it needs to changes and can improve my convenience.

TP16: These factors, I think, are the ones you have to add, because like many AR technologies after some devices can quickly identify it, it can automatically measure some parameters and then provide them for users to use. This relatively reduces the time it takes the user to measure himself actively. If the upper right corner of an AR glasses, for example, can show the degree of traffic congestion in the place I am going to now, or the time of road use, or the flow of people in a link at that time, it will certainly be of great help to my later schedule.

#### 4.2. Interaction

When tourists participate in augmented reality tourism, they thought that the technology could enrich the tourism content and encourage more tourists to travel.

EP1: This system adds some interactive operation of this kind, also not necessarily call process, add some interactive function. For example, during or at the end of your visit, there will be a virtual character in the AR environment, similar to an intelligent customer service provider or an intelligent commentator. It can provide the kind of interaction with participants to a certain extent.

TP12: For instance, you like a wild animal zoo now, you can say that can drive directly into the wild zoo, with interactive means you of that a moment, or in the Disney park, you see, how are you getting along with your parade with cartoon characters of that a moment, well that's the moment, tourists want to go to the kind of moment, bungee jumping or you the moment you go bungee jumping, that kind of experience, you feel unique.

#### 4.3. Privacy

Private is the last critical condition for visitors. Because of the Big Data age, the emphasis on privacy is becoming more meaningful and beneficial to visitors. They would question if a third-platform enterprise leaks their personal information; thus, in this regard, tourists will put more emphasis on this point.

TP10: First of all, private security must be the first. But for example, AR is just like all kinds of apps we are using all the time. I think AR will be as mature as all kinds of apps. And its security and privacy should be matched accordingly.

TP11: Privacy means that I don't think it will infringe on my privacy, but now, in the current environment, the era of big data will give people a sense of my privacy, my data is being peeped. I said I hope that the AR travel technology can take note of this, other than no significant problems. Because if you do, it gives the user a sense of security.

### 5. DISCUSSION AND CONCLUSION

This study identified many tourists' requirements in using augmented reality technologies; it provides the new thoughts for scholars to research more requirements in information technology application. Meanwhile, the outcome of results also can help managers and explorers improve and redesign similar augmented reality tourism. Tourists' requirements in information technology are scarce, especially in the newest information technology tourism method, future researches must examine these research gaps. In this study, we collect some

valuable data through thematic analysis base on coding and last integrate the main and high-frequency requirements while tourists in tourism.

There are many limitations to the present study. Firstly, the research found the tourists are mainly focused on young ages; in other words, this method of tourism is popular in young groups comparing with whole age groups. Secondly, in the research method chosen, the present study mainly used a qualitative approach, scaring some quantitative data to support these requirements and explore these categories. In this regard, in future research, we can make the quantitative method to examine their relationships between tourists' requirements, interaction, convenience and privacy, besides. The interviewees of the present including experts and tourists, however, most of them all stayed in China. Cause of Covid-19, research lacks some international tourists to support and examine these requirements. Therefore, the next future researches can do quantitative analyses, and the choice of interviewees can collect some international tourists' opinions.

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