Evaluation of the Tourist Acceptance of Quick Response (QR) Code: Using Technology Acceptance Model

Toka Mahrous Fahmy [(a)]   **Mahmoud Ramadan Al-Azab** [(b)]

(a) Tourism Studies Department, Faculty of Tourism and Hotels, University of Sadat City (b) Tourism Studies Department, Faculty of Tourism and Hotels, University of Sadat City

Abstract

The study-in-progress investigated technology acceptance model (TAM) for the usage of QR codes, and used TAM as a basis for hypothesizing the effects of such variables on the intention to use QR codes application. The technology acceptance model (TAM) proposes that perceived ease of use and perceived usefulness forecast applications usage. QR codes have become an increasingly popular mobile marketing tool due to the rapid growth of Internet technologies. Mobile tagging, based on QR codes, presents a chance to increase the accessibility of mobile services and obtain in-depth information immediately. QR codes let the operator of the attraction to send information about specific items, exhibits or locations directly to those locations which the tourist can then enter via the smartphone by scanning the QR code. This study focuses on the individual users' acceptance investigation for the QR codes in tourism marketing. It develops a technology usage model for the QR codes. The contributions of this study are twofold. First, this study may help identify whether tourists would like to accept QR codes or not. Second, this study will help to determine the factors that are significant in explaining the intention towards using QR codes.

Keywords: Tourism, Mobile marketing, QR code

1. Introduction

New technologies have become an essential component of our life (Hloušková and Šilhánková, 2014). The 21st century is the age of smartphones and Digital devices. It is the 'digital age' (Davies, 2014). Everyone around the world possesses a mobile phone. It has become the initial communication and trading tool for many people. We live in 'a mobile society' (Becker and Arnold, 2010).

The development of QR codes (Quick Response Codes) applications parallels the unmatched invasion of mobile devices. In the first quarter of

2014, in the U.S. market, the number of the smartphones is over 70 percent and increasing every day (Nielsen, 2014). Mobile device users, with 8 out of 10, have been supported by their mobile phones while shopping (Ertekin and Pelton "a", 2014). The number of QR code users is increasing. It has a place in the consumer culture and becomes a vital part of 'consumers' day-to-day browsing habits' (Ertekin and Pelton "a", 2014).

Several previous studies dealt with the QR codes in general and explored its relation to a variety of topics, such as advertising (Probst, 2012; Ertekin and Pelton, 2014; Meydanoglu, 2013), Marketing and Mobile marketing (Demir et al., 2015; Brabazon et al., 2014; Profound Ideation Inc., 2012; Pitney Bowes Inc., 2012; Sago, 2011; Weir, 2010), Security (Narayanan, 2012), use of QR code in Tourism in general (Emek, 2012), Religion tourism (Alshattanawi, 2012). However, there is a gap in the literature of previous studies for studying, effective acceptance and uses of the QR codes by tourists. This study is treating the gap in previous studies to evaluate the Tourist Acceptance of Quick Response (QR) Code.

This study makes important contributions in fulfilling this gab through studying the QR Codes with details, Its definition and history, its benefits, how to generate and read it, its uses in the tourism industry and in tourism marketing

This study aims to explore the acceptance of QR code in tourism enterprises through the literature review of the QR code, related studies and theories of technology acceptance model (TAM), theoretical basis and factors which may influence tourist's perception of usefulness and ease of use to understand the acceptance of QR code were chosen.

2. Theoretical Background

2.1. The History of QR Codes:

In 1994 QR Codes were produced in Japan by Denso Wave, a subsidiary of Toyota, as a method to organize car parts (Turner, 2013; Bello, 2012; Brabazon et al., 2014; Winter,2014). The primary purpose of the QR Code was for inventory, but its use expands away behind this function (Brabazon et al., 2014). Anyone worldwide can create QR Codes, with no cost or constraints (Brabazon et al., 2014). The using of QR codes outgrew the car industry and entered into many fields like the marketing domain (Weir, 2010). In 2011 QR code became commercialized with the development of the telecommunications industry. Today the commercial popularity of QR code is driven by smartphones (Probst, 2012).

2.2. Definition of QR Code:

A QR code, as shown in figure 1, can be defined as a two-dimensional printed barcode (Ertekin and Pelton "a", 2014) that looks like a square with smaller black and white squares (Waters, 2012) and can be decoded by readers on mobile devices equipped with a camera (Tang and Wang, 2012). Ertekin and Pelton "b"(2014:85) noted in short, that "QR code is a virtual pathway between buyer and seller ".

Figure 1: QR Code

2.3.The Benefits of QR Code

The main value of QR codes is their **interactive power** (Probst, 2012), and the reason for its quick response is that they link the offline world to online content with ease (Waters, 2012). It works as a bridge between physical and digital worlds (Hakimpour and Zardiny, 2014; Bello, 2012; Cooper, 2011). Once reading a QR code, the user will pass from offline to limitless online contents (Tang and Wang, 2012; Probst, 2012), and can obtain any kind of file that it was designed (Capua et al., 2012).

Davis (2014) pointed out that 'QR codes are a beneficial additional tool for interpretation' alongside the traditional methods such as signs, Website, and brochures. QR codes can include many various types of information such as events list and dates, contact address, text, website address and links to download anything (Narayanan, 2012; Demir et al., 2015).

QR codes also offer versatility as they can be expanded and minimized to the size of a signboard or a stamp respectively, and can be integrated with any kind of marketing materials (Probst, 2012). "They are capable of encoding the same amount of data in approximately one-tenth the space of a traditional 1D code" (Querini et al., 2011,p:140).

According to Ertekin and Pelton "a" (2014:47), "the companies that effectively use QR codes gain a competitive advantage over the others", especially in some market segments such as college students and

teenagers (Demir et al., 2015). Davis (2014) noted that QR codes appeal to mobile users' curiosity. QR codes are becoming Pervasive in all of the life aspects (Alshattanawi, 2012) because they're easy to use, viral interest, and allow to connect to clients both online and offline (Olsher, 2012).

QR Code storage capacity (table 1) depends on the types of data encoded (Demir et al., 2015; Hakimpour and Zardiny, 2014), which could be numeric, alphanumeric, binary, and Kanji (Alshattnawi, 2012; Hakimpour and Zardiny, 2014). There are several versions of QR code data capacity (Alshattnawi, 2012). For example, the storage capacity of QR codes in its fourth generation includes new options about previous ones (Demir et al., 2015).

Table 1: QR code Data Capacities

QR code Data Capacities	Storage Capacity
A. Numeric or Digit:	7,089 numbers maximum.
B. Alphanumeric or Letter:	4,296 characters' maximum
C. Binary number (8bit):	2,953 bits maximum
D. Japanese Kanji/katakana:	1,817 characters maximum (Shift_JIS) .
E. Chinese character:	984 characters maximum (UTF-8) .
F. Chinese character:	1,800 characters maximum (BIG 5).

Source: (Chen and Weng, 2010)

QR Codes are more durable, where it has 'error correction capability' for restoring and decoding data even if part of the code is damaged or missing (Waters, 2012; Emek, 2012; Zhang et al., 2012). There are four levels of error corrections (L 7%, M 15%, Q 25%, and H 30% error correction) (Hakimpour and Zardiny, 2014).

Querini et al. (2011) argued that a QR code has a splitting function. This feature enabled users to get a number of QR codes (up to 16 codes) containing the same data to print them in smaller areas.

QR codes can achieve many advantages for users such as obtaining a value, receiving exclusive service about others, and make hime as a part of a particular society (Profound Ideation Inc., 2012), saving precious time and money (Alshattnawi,2012; Profound Ideation Inc., 2012). QR codes have many hidden advantages over traditional bar codes. **First**, creating it with free software and using without a license. **Second**,

containing more information than a bar code. **Third**, reading it with any smartphone equipped with a camera (Cox and Shiffler, 2014).

In a traditional barcode data can be read only vertically (Waters, 2012; Narayanan, 2012), while a QR code can be Readable from any direction (Brabazon et al., 2014; Zhang et al., 2012) both vertically and horizontally (figure 2) (Waters, 2012; Narayanan, 2012). This feature is completed through the three squares which located at the three corners of the code (Querini et al., 2011). Because QR codes can read in two directions, they are referred to as two-dimensional barcodes (Brabazon et al., 2014; Winter, 2010). Emek (2012) noted that "classic 1D barcodes show "product identification" while QR codes show "product descriptions".
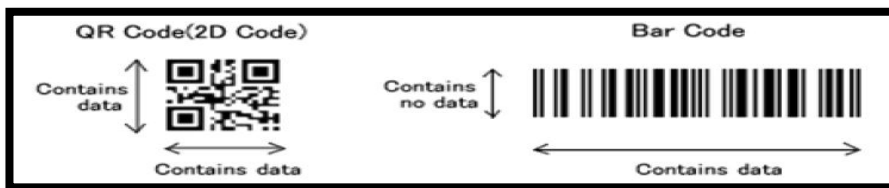

Figure 2: A QR code allows storing more information than a barcode
Source: (**Waters, 2012**)

2.4. Generating and Reading of QR Code

Regardless of its various functions, a QR code is easy to create. There are many free softwares and QR code generators available online like (Kaywa: http://qrcode.kaywa.com or QR Stuff: http://www.qrstuff.com/index.html) (Bello, 2012; Tang and Wang, 2012; Martínez-Graña, 2013). The steps to generate a QR code are not difficult (Li, 2014; Meydanoglu,2013) as follows:
- Using a search engine to find a specific QR code generator.
- Setting the type of data that will be encoded (e.g. URL, e-mail address. etc.)
- Specifying the choices of additional customization (e.g. Size, color, style. etc.)
- Creating the code after the required information has been entered.

QR Codes can be read by so-called "reading applications", which are essentially "barcode scanners" (Unitag, 2016). They are freely available online for most devices (Meydanoglu, 2013). The user can read or scan a QR code through an easy three steps (Figure 3), as follows (Unitag, 2016; Meydanoglu, 2013; Winter, 2010):

- Download a reader from any application store. When the application is downloaded, the phone's camera becomes a QR code scanner.
- Start the application and scan the QR code.
- Put the camera toward the code until you can see it in your viewer and scan it. Don't press any button, the picture will be taken automatically to decode the code.
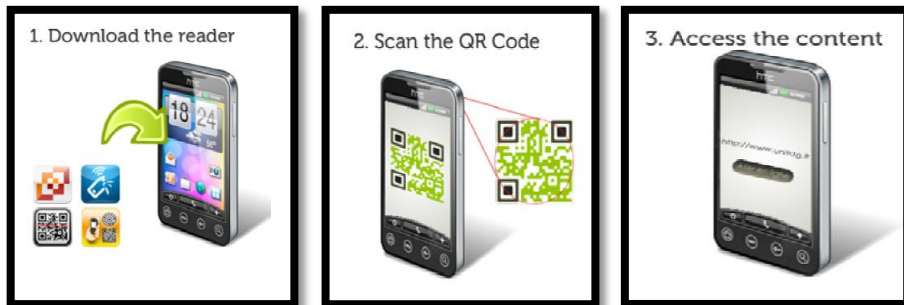

Figure 3: How to read a QR code
Source: (unitag, 2016)

Once the reader application captures the targeted code, The decoding process would be finished (Tang and Wang, 2012). Consumers can take whatever action the code instructs such as learning more in-depth about the product, sales promotions, and offers and more (Ertekinand Pelton "b", 2014).

2.5. Applications and Uses of QR Code

According to the research by the Yankee Group firm, the number of QR code users worldwide increased from 18 to 104 million between 2012 and 2016 (Pasque and Elkin, 2013), which means the base of QR code users and its popularity is increasing quickly worldwide (Turner, 2013; Shin et al., 2012). In Japan- where QR codes appeared- people use them increasingly in their everyday life, such as in magazines, stores, McDonald's wrappers (Mostafa, 2014), advertisement, shopping, WebPages, passports and visas, and travel leaflets (Chen and Weng, 2010). QR code applications are relatively high in many other countries around the world (Pasque and Elkin, 2013)

The usage of QR codes prevailed worldwide in several domains (Zhang et al., 2012) as a data accessibility tool (Waters, 2012). It can be used in marketing, shipping, inventory, education, healthcare, tourism (Fathin and Nurul, 2014), warehousing, logistics services, and transportation (Puhe et al., 2014). It can be found in advertisements, retail stores, airlines,

restaurant menus, product information (Cox and Shiffler, 2014), brochures, flyers, product cards, packaging, trucks, and on screens in shopping malls (Tang and Wang, 2012), data encoding, fun (Bello, 2012). QR code applications can be used to make purchases, access additional information in the web, offer discount coupons, interact with social media (Shin et al., 2012), make mobile payments, and Scan e-ticket, and numerous other applications (DeMers, 2014).

 QR codes are increasingly printed on 'business cards, posters, billboards, clothing, and many other things' (Puhe et al., 2014). It can be added about anywhere like interpretive and visitor information signs, or 'even on a stand-alone post' (Trail and Scotia, 2012). Puhe et al. (2014) pointed out that "QR codes can be used for location-based services (e.g. On timetables at the station to Know arrival times of the next transport means) or for e-payment using a mobile phone and QR code printed on tickets".

2.6. Applications and Uses in Tourism Industry

Tourism and hotel businesses are seeking to take advantage of the growing power of the Internet and mobile devices to provide new mobile marketing strategies in order to attract this increasing consumer trend (Car et al., 2011). Today, tourists depend on mobile tagging, based on QR code to achieve several needs and services and to obtain a lot of information at any time (Emek, 2012).

In a tourism field, QR codes can increase the tourist experience at a destination (Dickinson et al., 2014) and influence him positively (Vichivanives and Ralangarm2015). Tourists can obtain more information about a special point of interest in their trip by scanning a QR code quickly (Kerry-Bedell, 2012). QR code can be usable on many tourism areas, as follows:

2.6.1. Museums, galleries, and historical places

Rolando and Scandiffio (2013) noted that QR code could improve interaction between tourists and cultural places. In this case, information exchange between them would be in a positive direction, but not just a passive exchange of information between tourist and smartphone. QR codes can act as "a personal tour guide" (Davis, 2014; Kerry-Bedell, 2012). There is not enough information on posters which was found in temples and historical places. So, tourists could scan QR Codes to search for more information about the temple, its history (Vichivanives and Ralangarm, 2015, Wolff et al., 2014), and offer a multi-media experience

for them like in The Cleveland Museum of Art place (Walter, 2016; Emaldi et al., 2010; Trail and Scotia 2012; Emek, 2012). Many foreign cities, streets, castles, rivers, and parks have the informative codes and use these codes to provide tourism information to the tourist's mobile phones through QR code scanning (Emek, 2012).

2.6.2. Accommodation and Restaurants

Accommodation places can use QR codes in many areas like rooms, elevators, and the lobby to give customers more information and instructions or tips during their stay (Emek, 2012). Restaurants can also use QR codes to identify the history of the restaurant, Nutritional Information, video recipes, coupons, and receipts with customer survey, restaurant location, daily or weekly event details, and education (Profound Ideation Inc., 2012).

2.6.3. Travel and Ticketing

QR codes can be used for the payment of train or airline tickets (Meydanoglu, 2013). Many airlines use QR code for promotion and boarding services (Emek, 2012). American Airlines was one of the first to use QR Codes to provide an instant information for travelers such as real time for the flight and how to access to a reservation portal (Turner, 2013). The ticket data is encrypted in a QR code and sent to the traveler via a website or in a text message (Canadi et al., 2010). The customer only needs to scan the QR Code at the gate (Chen and Weng, 2010). Zhang et al. (2012) noted that "QR code could be the best carrier for e-tickets"

2.6.4. Event information

According to Canadi et al. (2010) QR codes are used to provide additional facts and data about the event such as time, location and event description via encoded hyperlink to lead to the mobile website. Alshattnawi (2012) mentioned that QR codes could be effective in religious trips like "Umrah or Hajj". The visitor needs to capture the QR codes, save them on his mobile and use them to identify all the necessary information which supported with videos about pilgrimage steps and how to use QR codes.

2.7. Applications and Uses in Tourism Marketing

Most owners of smart devices addict to use them in everything (Profound Ideation Inc., 2012). It is a very important issue from the perspective of marketers (Car et al., 2011). As a result, A new marketing channel appeared (Car et al., 2011), Which makes marketing companies pay increasing attention to present a new marketing strategy towards this

market segment (Demir et al, 2015). Today, many companies can apply QR codes marketing strategy (DeMers, 2014). QR code provides more flexibility for marketers (Pitney Bowes Inc., 2012). It can be used in interactive marketing and advertising to offer several tools (e.g. Questionnaires, voting) and information about their customers' needs (Meydanoglu, 2013; Sago, 2011).

QR Codes can be integrated into any type of printed materials (Human Service Solutions, 2016). Many indicators and marketing information can be obtained from the integration of QR codes into print advertising (Meydanoglu, 2013). Each time a QR Code is scanned, the company receives information on Geo. Location, time and date of scanning (Brabazon et al., 2014), the average time spent on the site, the total number of scans, and the country (Meydanoglu, 2013; Brabazon et al., 2014).

All of this information is very valuable to measure the tourism marketing campaign effectiveness, through providing information about demographic components and consumer behaviors (Meydanoglu, 2013). Companies also use this information to evaluate the return on investment of QR marketing (Sago, 2011) in order to measure the success of the marketing campaign and the possibility of implementing the next campaign (Meydanoglu, 2013).

QR codes marketing campaigns can be used in shops (Emek, 2012). These campaigns can emerge the consumer's curiosity while shopping (Meydanoglu, 2013). For example, the Korean Tesco company implemented a marketing campaign in subway station entitled "Let the store come to people" by establishing a virtual store. After customers scan the QR code of the product and choose what suit them, purchased products are sent to their home. Tesco's online sales increased 130 % after the campaign (Walter, 2016).

Finally, QR Codes are one of the best tools available for tourism marketing to smartphone users (Waters, 2012). Mobile applications such as QR codes are forming the marketing scene in the future (Ertekin and Pelton "a", 2014). "Marketers see QR codes as an effective way to attract customers and keep the brand in their mind" (Probst, 2012). "This is what makes QR Codes such a strong marketing tool for any industry" (Pitney Bowes Inc., 2012).

3. Conceptual framework and hypotheses development

3.1. Technology Acceptance Model (TAM)

Technology acceptance model (TAM) is an intention-based model developed specifically for clarifying and/or predicting user acceptance of new technologies (Goh, 2011). Technology acceptance was defined as "an individual's psychological state with regard to his or her voluntary or intended use of a particular technology" (Park, 2009, p:152). TAM posits that two factors, perceived usefulness and perceived ease of use, are the two main determinants of system usage in organizations (Kim & Woo, 2016). In TAM, Perceived Usefulness (PU) is defined as the degree to which an individual believes that using a particular system would enhance his or her job performance whereas, Perceived Ease of Use (PEOU) is the degree to which an individual believes that using a particular system would be free of physical and mental effort (Davis, et al., 1989).

A considerable number of studies have indicated that the Technology Acceptance Model (TAM) is a proper psychometric tool with which to evaluate consumers' acceptance of technology, determined by the individual's opinion of the new technology's usefulness (e.g Kim & Woo,2016; Goh, 2011; Lee et al., 2011; Park, 2009; Chu, *et al.*, 2010). Therefore, the first purpose of this study is to apply the TAM to domestic tourists'acceptance of the QR Code in tourism marketing to assess their acceptance for the use of QR codes. The research presented here is motivated and guided according to (TAM) by main hypotheses that are:

H1. Perceived ease of use (PEOU) positively affects Perceived usefulness (PU).
H2. Perceived usefulness (PU) positively affects Attitude toward using (ATT).
H3. Perceived ease of use (PEOU) positively affects Attitude toward using (ATT).
H4. Attitude toward using (QR) code positively affects intention to use it.
H5. Perceived usefulness (PU) positively affects intention to use it.

3.2. Perceived information quality (PIQ)

Information Quality should be judged using the criteria of relevance, accessibility (validity), interpretability, and integrity (composed of accuracy and completeness) (Bovee 2004). Nicolaou& McKnight (2006, p: 337) define PIQ to mean "cognitive beliefs about the favorable or unfavorable characteristics of the currency, accuracy, completeness, relevance, and reliability of the exchange information".

While, research has noted the importance of perceived information quality (PIQ) in the acceptance of new technology and its link to individuals' intentions to use a new technology system (Amoako-Gyampah, 2007). PIQ has been linked in empirical studies to influencing customers' PU positively (e.g.,Chen& Huang, 2013; Rese, et al.,2014). Morover, Rese et al. (2014) identified a positive relationship between information on users' consumption choice and their confidence in the usefulness of the information provided by the new technology. Thus, the current study adds PIQ to the original TAM as an important variable to examine the PU of the QR Code for the domestic tourist.

From this point of views, this study seeks to expand the TAM including PIQ in order to find out the effect of the constructs on the intention to use the QR Code in tourism marketing, and given these findings, hypothesis is further proposed as:-

H6. Perceived information quality (PIQ) positively affects Perceived usefulness (PU) of QR code.

3.3. Perceived Interactivity (PI)
There is no well-established scope and definition for ''interactivity'' (Johnson et al., 2006) although the concept is regarded as crucial to a successful internet based marketing (Cyr et al., 2009). As already outlined, earlier research by Lee (2005) four important components to interactivity in a mobile commerce setting can be defined, namely :(1) user control, (2) responsiveness, (3) personalization, and (4) connectedness. Hence, the concept of interactivity has received much interest from scholars in various disciplines (Kim, 2011). Moreover, Zhao (2012, p:830) defined interactivity from four different perspectives: as a feature of technology, as a process of message exchange, as a user's perception of using a technology or going through a process, and as the combination of the above three perspectives. From a perception-based perspective, perceived interactivity was defined as "the extent to which users perceive their experiences as a simulation of interpersonal interaction and sense they are in the presence of a social other" (Thorson& Rodgers, 2006, p:6). Thus, the current study adds PI to the original TAM as a vital variable to examine the PU of the QR Code for the domestic tourist.

H7. Perceived interactivity (PI) positively affects Perceived usefulness (PU) of QR code.
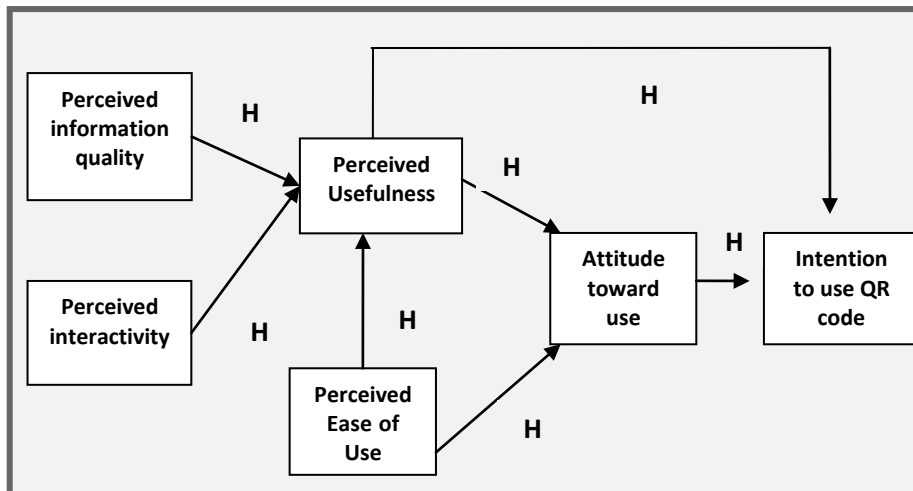
**Figure 4. The research model (A technology usage model for QR code)
Adapted from the Technology Acceptance Model Davis (1989)**

4. Methodology
This study, based on TAM, is paying attention to clarify and predict QR codes acceptance behavior, as well as to develop external variables (perceived information quality and perceived interactivity) which influence perceived usefulness, perceived ease of use and behavioral intention.

4.1. Research Design
In order to test the research hypotheses, a well-structured questionnaire was designed and distributed to a convenience sample of tourists who agree to participate in this study. The research limits the age of the participant to be between 18 and 35 years because, technology is already extensively adopted among the younger age group. Moreover, a trip searching scenario was created by mimicking travelers' use of a smartphone device to scan a predefined QR code, searching for destination (i.e. Egypt) related information.

Questionnaires were distributed among 150 domestic tourists. These tourists first participated in 10 minutes' explanation on the Integrated QR Code in tourism marketing learn the design concepts and functions of the QR code. Then, the tourists were provided with mobile devices to scan predefined QR codes related to tourism destinations. Then, the tourists were instructed to complete the questionnaires. The main points for analysis (the variables) were the aspects of "perceived information quality, perceived interactivity" "usefulness," "ease of use", "attitudes

and intention to use." We used multiple regressions analysis to develop a path for tourists' intention to use the QR code

4.2. Research instrument

A questionnaire was used to gather the information required for the study. The questionnaire elicited information about demographic, perceived information quality, perceived interactivity, perceived usefulness, perceived ease of use and intention to use. The questionnaire was developed based on researches conducted by Davis, Bagozzi and Warshaw (1989), Basyir (2000), Ndubisi et al. (2001), Polatoglu et al. (2001) and Kim & Woo (2016). The intention to use measure was adapted from Davis et al. (1989).

The survey was conducted domestic tourists to evaluate the acceptance of QR codes using TAM. Respondents were asked to rate their opinion using a 5-point Likert scale ranging from 1=Strongly disagree, 2=Disagree, 3=Neither disagree nor disagree, 4=Agree and 5=Strongly agree, for perceived ease of use and perceived usefulness. Questions measuring intention to use QR codes used a 5-point Likert scale ranging from 1=Very Unlikely, 2=Unlikely, 3=Neither unlikely nor likely, 4=Likely and 5=Very Likely.

5. Results

150 questionnaires were distributed and collected, there were 28 questionnaires, and the rate of valid questionnaire is 81%. Descriptive statistics collected from the survey showed the majority of the subjects were female 70.5% and the numbers of male represent 29.5% of respondents.

Measurement validity in terms of reliability and construct validity was evaluated. The reliability analysis was conducted to make sure that there are an internal validity and consistency for the items used for each variable. Hair et al. (1998) recommended that Cronbach alpha values from 0.6 to 0.7 were deemed the lower limit of acceptability. An alpha of more than 0.7 would indicate that the items are homogeneous and measuring the same constant. Table 2 shows the reliability of the measurement scales. Cronbach's alpha reliability scores were all over 0.7, which is considered very well (Nunnally, 1994). Hence, the results demonstrate that the questionnaire is a reliable measurement instrument.

Table 2 Cronbach's alpha (Reliability)

Scale	Cronbach's alpha
Perceived Ease of Use (PEOU)	0.742
Perceived Usefulness (PU)	0.758
Attitude Toward Using (ATTITUDE)	0.810
Intention to Use (ITU)	0.791
Perceived information quality(PIQ)	0.901
Perceived interactivity(PI)	0.762

As indicated in table 3 there is no significant difference between participants' gender and the variables namely Perceived Ease of Use, Intention to Use and Perceived information quality. In the contrary, results identified that there is a significant difference between male and female on perceiving the usefulness and interactivity of QR codes and the attitude toward using QR code.

Table 3 independent sample T test between male and female

	F	Sig.	t	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Perceived Ease of Use (PEOU)	.388	.534	1.45	.18717	.12826	-.0667	.44112
Perceived Usefulness (PU)	8.165	.005	4.04	-.49064-	.12123	-.7306	-.2506
Attitude Toward Using (ATTITUDE)	15.830	.000	2.35	-.25592-	.10868	-.4711	-.0407
Intention to Use (ITU)	1.285	.259	-.817	-.07420-	.09081	-.2540	.1056
Perceived information quality(PIQ)	.075	.785	1.498	.10328	.06895	-.0332	.2397
Perceived interactivity(PI)	29.063	.000	2.680	.17781	.06636	.0464	.3091

Table 4 indicated the mean and standard deviation for all the study variables, as it is clear from table 4 that perceived ease of use was the highest mean (4.30) with a standard deviation of 0.667, and the lowest mean was for attitude toward using QR code (3.57) with a standard deviation of 0.500

Table 4 Descriptive statistics for the study variables

Constructs	Mean	SD
Perceived Ease of Use (PEOU)	**4.30**	**.667**
1. I found (QR) codes easy to use	4.16	.930
2. My interaction with (QR) codes was clear and understandable.	4.30	.869
3. It would be easy for me to find information at (QR) codes.	4.46	.815
Perceived Usefulness (PU)	**3.84**	**.718**
4. I evaluate QR code service as practical.	3.51	1.006
5. I evaluate QR codes as functional.	3.80	.852
6. I found (QR) codes useful.	4.25	.990
Attitude Toward Using (ATTITUDE)	**3.57**	**.500**
7. I dislike the idea of using (QR) codes	2.96	1.673
8. I have a generally favorable attitude toward using (QR) codes.	2.95	.943
9. I would have positive feelings toward using QR Codes.	3.68	.973
10. I think QR codes would make my life more interesting.	3.60	.799
11. I am satisfied with QR code	3.96	1.007
12. I believe it is (would be) a good idea to use this (QR) codes.	4.22	.895
13. Using (QR) codes is a foolish idea.	3.64	1.312
Intention to Use (ITU)	**3.87**	**.484**
14. I think I will use QR codes in the future.	4.02	1.052
15. I will return to (QR) codes often.	3.42	1.019
16. I recommend that others use QR codes.	3.88	.829
17. I intend to visit (QR) codes frequently for search about tourism destinations.	4.19	.894
Perceived information quality(PIQ)	**3.70**	**.399**
18. I think that QR codes provide a variety of information and services.	3.89	.695
19. I think that the services and information I can get from QR codes are valuable.	3.74	.666
20. QR codes provide the information and services that I need in a timely fashion.	3.45	.804
21. I'm more likely to purchase a product if I'm able to scan its QR code first	3.76	.576
Perceived interactivity(PI)	**3.60**	**.373**

22. I want immediate valuable and relevant information when I scan the QR codes (Responsiveness)	3.14	.998
23. I think that QR codes provide very reliable service.	3.50	.956
24. Through QR codes, I felt like I was having a personal conversation with a knowledgeable representative from the company.	3.87	.802
25. I was in control over the QR code information when using the code.	3.71	.904
26. I feel like I am connected through QR code	3.64	.844
27. I always on the lookout for a QR code to scan when I first see a new product	3.77	.665

The bivariate correlations among 6 factors are listed in Table 5 Most factors are significantly related to each other, the greatest relationship is between perceived information quality and intention to use.

Table 5 Correlation between the study variables

Variables		1	2	3	4	5	6
1-Perceived Ease of Use (PEOU)	Pearson Correlation	1	.438**	.436**	.307**	.487**	.359**
	Sig		.000	.000	.001	.000	.000
2- Perceived Usefulness (PU)	Pearson Correlation	.438**	1	.344**	.211*	.065	.104
	Sig	.000		.000	.020	.008	.005
3-Attitude Toward Using (ATTITUDE)	Pearson Correlation	.436**	.344**	1	.438**	.359**	.206*
	Sig	.000	.000		.000	.000	.023
4- Intention to Use (ITU)	Pearson Correlation	.307**	.211*	.438**	1	.477**	.339**
	Sig	.001	.020	.000		.000	.000
5-Perceived information quality(PIQ)	Pearson Correlation	.487**	.065	.359**	.477**	1	.454**
	Sig	.000	.008	.000	.000		.000
6- Perceived interactivity(PI)	Pearson Correlation	.359**	.104	.206*	.339**	.454**	1
	Sig	.000	.005	.023	.000	.000	

(**)Correlation is significant at the 0.01 level (2-tailed)
(*) Correlation is significant at the 0.05 level (2-tailed).

Separate linear regression analyses were conducted based on 122 completed surveys collected from the study. In testing Hypothesis 1 (H1), (H6) and (H7) a regression analysis was performed, with perceived ease

of use, perceived information quality and perceived interactivity as independent variables and perceived usefulness as dependent variable. Table 6 presents the regression results used to test H1,H6 and H7.

Table 6 Regression results for (H1), (H6) and (H7)

Model	Unstandardized Coefficients		t	Sig.	R^2
	B	Std. Error			
Perceived Ease of use	.542	.131	6.852	.009	0.55
Perceived information quality	.456	.067	3.871	.000	
Perceived interactivity	.123	.098	2.985	.070	

a. Dependent Variable: perceived usefulness.

As shown in Table 6, perceived ease of use, perceived information quality had a significant effect on perceived usefulness, with $p < 0.01$. The effect of perceived ease of use, perceived information quality and perceived interactivity explains 55% of the variance of perceived usefulness by the study participants. While perceived ease of use and perceived information quality had a significant effect on perceived usefulness, perceived interactivity did not. Thus, Hypothesis 1and 6 were supported, but Hypothesis 7 (H7) was not supported.

Hypothesis 2 (H2) and Hypothesis 3 (H3) were tested by regressing both perceived ease of use and perceived usefulness on attitude towards using the QR code. Table 7 provided results from the regression analysis for both H2 and H3.

Table 7 Regression results for (H2) and (H3)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R^2
	B	Std. Error	Beta			
Perceived Ease of use	.422	.134	.234	2.731	.007	.140
Perceived usefulness	.567	.127	.331	5.561	.000	

a. Dependent Variable: Attitude towards using QR codes.

As indicated in Table 7, both perceived ease of use and perceived usefulness have a significant influence on attitude toward using QR codes. Accordingly, H2 and H3 are both supported.

Hypothesis 4 (H4) and Hypothesis 5 (H5) were tested through a third regression model, with perceived usefulness and attitude regressing upon

intention to use. To control for the indirect influence of perceived usefulness on intention to use through attitude, a stepwise regression was performed in which perceived usefulness was entered in step one and attitude toward using was entered in step two. Results for H4 and H5 are presented in Table 8.

Table 8 Regression results for (H4) and (H5)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R^2
	B	**Std. Error**	**Beta**			
Perceived usefulness	.482	.087	.234	2.569	.004	.491
Attitude toward using	.667	.107	.331	8.561	.000	

a.   **Dependent Variable: intention to use QR codes.**

Consistent with prior research (Davis, 1989 & Hu et al., 1999), perceived usefulness had a significant effect on intention to use, with $p < 0.001$. The effect of perceived usefulness and attitude toward using explains 49.1% of the variance of usage intentions by tourists. Perceived usefulness and perceived ease of use had a significant effect on intention to use. Thus, Hypothesis 4 (H4) and Hypothesis 5 (H5) were supported. Table 9 summarizes the results of the hypotheses testing, and Figure 5 shows these results.

Table 9 the results of the hypotheses testing

| Hypothesis	Relationship tested	Results
H1	**Perceived ease of use (PEOU) positively affects Perceived usefulness (PU)**	**Supported (p<.05)**
H2	**Perceived usefulness (PU) positively affects Attitude toward using (ATT)**	**Supported (p<.05)**
H3	**Perceived ease of use (PEOU) positively affects Attitude toward using (ATT).**	**Supported (p<.05)**
H4	**Attitude toward using (QR) code positively affects intention to use it.**	**Supported (p<.05)**
H5	**Perceived usefulness (PU) positively affects intention to use it.**	**Supported (p<.05)**
H6	**Perceived interactivity (PI) positively affects Perceived usefulness (PU) of QR code**	**Supported (p<.05)**
H7	**Perceived interactivity (PI) positively affects Perceived usefulness (PU) of QR code**	**Not Supported (p>05)**
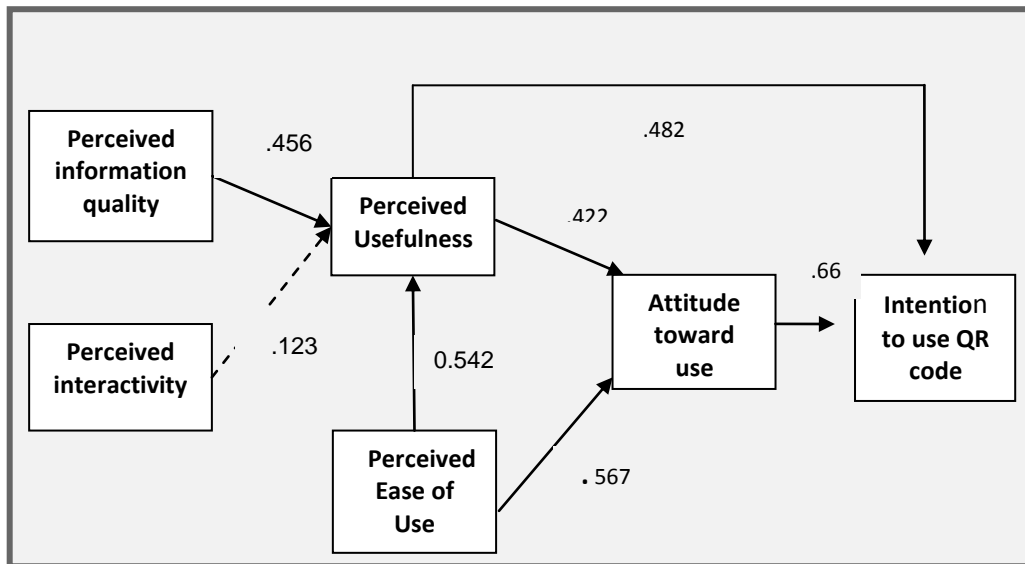
Figure 5 the results of the research model.

6. Discussion

This study was intended to empirically assess the acceptance model of QR codes to clear up the change of tourists' behavioral intentions to use the QR codes. In concurrence with what TAM, hypothesizes perceived usefulness was found to affect tourist intentions to use QR code. This outcome is predictable with the discoveries of prior studies (e.g., Kim &Woo, 2016; Rese et al., 2014; Venkatesh and Davis, 1996), which suggested the essential part of PU in consumers' acceptance of new technology.

In agreement with what TAM speculates, the attitude was found to significantly affect intention to use. Also, Results demonstrated that attitude toward using QR code is more essential in determining intention to use than perceived usefulness. Moreover, perceived usefulness and perceived ease of use were likewise found to significantly affect attitude towards using the technology. In agreement with that, the research of Rese et al. (2014) showed a positive and strong relationship amongst PU and ATT, parallel to results of the present study. The findings show that tourists comprehend the vitality and viability of the QR Code in the tourism businessand that this concern positively affects their attitude toward using the QR Code.

Compared with previous TAM studies, the model appeared to have a strong utility for explaining tourists' attitude formation and intention growth. The results of this study show that TAM can be used to explain the tourists' acceptance of QR code technology.

The proposed conceptual model aims to expand knowledge on the role of perceived QR code interactivity in influencing QR code perceived usefulness. The effect of PI was found to have no significant effect in the PU of the QR Code, this result come in the contrary of the result of previous research (e.g., Chen & Huang, 2013; Kim &Woo,2016; Lee et al., 2016; Rese et al., 2014; Stolzenbach et al., 2013). These other studies found a positive relationship between PI and PU in the TAM. The study found perceived information quality (PIQ) to be highly predictive of the QR code perceived usefulness. This result may reflect that the information quality was more important to determine the usefulness of the QR code for tourists. This may be due to the intangibility of the tourism services and the tourists need to the information quality to protect their rights by providing more information to ensure the tourism service quality, and to alleviate uncertainty, and then strengthen tourists' purchase intention

The results of this study can help marketers to create effective strategies, as the results recommend that it is crucial to offer highlight to information quality for consumers. The study findings revealed that customer considers QR code for tourism marketing to make accessible detailed information about tourism that helps the tourist in his/her choice.

7. Conclusions and Recommendations

This study represents research in investigating the appropriateness of TAM to clear up tourists' acceptance of the QR code technology inside the marketing setting in tourism industry. The model was tested using data collected from 122 tourists. One of interesting results of the study is that both perceived usefulness and Perceived ease tourism marketing. The study emphasized on the importance of Perceived information quality in affecting the tourist perceived usefulness.

Several implications can be drawn from the results of the study. To begin with, utilizing QR code marketing strategy will add value to the tourism destinations and associations. QR codes afford companies and destinations a fruitful approach to publicize their items that a printed page can't duplicate. QR codes can draw in tourists much superior to anything customary printed promotions. **Second**, from a managerial point of view,

the findings of this study reveal that, in order to support tourist intention to use a technology, positive perception of the technology's usefulness is essential; moreover, the attitude toward using the technology is also very crucial in determining the tourist intention to use QR code.

Third, it can be advised that future studies search for relevant theories in studying the effects of QR-codes on the consumer. In addition, future research should spotlight on the outcomes of the use of QR-codes, also give more insights into consumers' motivations to scan a QR-code are important too, this can be studied by applying the motivational theory. Also, future studies should investigate the role of adding additional variables to those originally used in the TAM model. Future research should consider the possible effect of more demographic factors such as marital status, occupation, education, etc. on acceptance of the QR code.

References

Alshattnawi, S.(2012). Effective use of QR Codes in Religious Tourism, International Conference on Advanced Computer Science Applications and Technologies(ACSAT), Kuala Lumpur, 26-28 Nov. 2012.pp. 497 – 501.

Amoako-Gyampah, K. (2007). Perceived usefulness, user involvement and behavioral intention: an empirical study of ERP implementation. Computers in Human Behavior, 23, 1232-1248.

Becker, M.and Arnold, J.(2010). Mobile Marketing for Dummies, Wiley Publishing, Inc., Indianapolis, Indiana.

Bello,A.M.(2012). Use of QR Codes in VAMK, Vaasan Ammattikorkeakoulu, Mechanical and Production Engineering, University of Applied Sciences.

Bovee, M. W. (2004). Information quality: A conceptual framework and empirical validation. Ph.D. dissertation, University of Kansas, Lawrence, KS.

Brabazon, T., Winter, M., & Gandy, B. (2014). Digital Wine "How QR Codes Facilitate New Markets for Small Wine Industries", Springer, London.

Canadi, M., Höpken, W., & Fuchs, M. (2010). Application of QR Codes in Online Travel Distribution In :Gretzel Ulrike; Law Rob; and Fuchs Matthias (eds) , Information and Communication Technologies in tourism 2010 , Proceedings of the International Conference in Lugano, Switzerland, February 10-12, 2010.

Capua, M., Guyette, J., Hetherman, B., and Hock, L. (2012). The Impact of Tourism on the Venice "Public Transportation System", an Interactive Qualifying Project Report, Worcester Polytechnic Institute.

Car, T., Šimunic, M., and Laškarin, M. (2011). Mobile marketing and advertising strategies in tourism and hospitality industry, Interdisciplinary Journal of Contemporary Research in Business, Vol. 3,. No. 6,pp. 809-821.

Chen, C. M., &Weng, T. (2010). Research and Development of Application of Mobile Barcode to Mobile Sightseeing Guide on Mobile Phone, WSEAS Transactions on Information Science and Applications,Vol.7,No.1,16-25.

Chen, M. & Huang, C. (2013). The impacts of the food traceability system and consumer involvement on consumers' purchase intentions toward fast foods. Food Control, 33, 313-319

Chu, H. H., Lu, T. J., &Wann, J. W. (2010). Evaluation of the Acceptance of Audience Response System by Corporations Using the Technology Acceptance Model. In *E-business Technology and Strategy* (pp. 281-291). Springer Berlin Heidelberg.

Cooper, L.(2011). Crack the code to open up new communication lines, Available at: https://www.marketingweek.com/2011/02/23/crack-the-code-to-open-up-new-communication-lines/, Accessed on: 16/4/2016.

Cox, S., and Shiffler, R. E. (2014). Extent of QR Code Adoption by Consumers, International Journal of Business, Humanities and Technology Vol. 4, No. 6.

Cyr, D., Head, M., & Ivanov, A. (2009). Perceived interactivity leading to e-loyalty: Development of a model for cognitive–affective user responses.International Journal of Human-computer studies, 67(10), 850-869.

Davies, J. (2014). On-site digital heritage interpretation: current uses and future possibilities in world heritage sites. Unpublished MA thesis, Department of Archaeology, Durham University.

Davis, F. D., Bagozzi, R. P., &Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science*, *35*(8), 982-1003.

DeMers, J. (2014). How to Use QR Codes in Your Marketing Campaign, available at: https://www.searchenginejournal.com/use-qr-codesmarketing-campaign/103049/, accessed on: 1/2/2016).

Demir, S., Kaynak, R., &Demir, K. A. (2015). Usage level and future intent of use of quick response (QR) codes for mobile marketing among college students in Turkey, 3rd International Conference on Leadership, Technology and Innovation Management, At Istanbul /Turkey, Elsevier Ltd., Procedia - Social and Behavioral Sciences 181 (2015) 405 – 413.

Dickinson, J. E., Ghali, K., Cherrett, T., Speed, C., Davies, N., &Norgate, S. (2014). Tourism and the smartphone app: Capabilities, emerging practice and scope in the travel domain. Current Issues in Tourism, 17(1), 84-101.

Emaldi, M., Lázaro, J., Laiseca, X., &López-de-Ipiña, D. (2012, December). LinkedQR: Improving tourism experience through linked data and QR codes. InInternational Conference on Ubiquitous Computing and Ambient Intelligence(pp. 371-378). Springer Berlin Heidelberg.

Emek, M. (2012). Usage of QR Code in the Tourism Industry, 24-29 April 2012 Fethiye, Turkey. 6th World Conference for Graduate Research in Tourism, Hospitality and Leisure.

Ertekin, S., & Pelton, L. E.   ” a” (2014). An empirical study of consumer motivations to use QR codes on magazine ads. American International Journal of Contemporary Research, 4(5), 47-55.

Ertekin, S., & Pelton, L. E.”b” (2014). Raising the Bar for Consumer Engagement: Qualitative Investigation of Attitudes for Quick Response Codes in Magazine Advertisements, Journal of Marketing Development and Competitiveness 8(3) , 84-94.

Fathin, L. N. and Emran N.A. (2014). Data Accessibility Model Using QR Code for Lifetime Healthcare Records, World Applied Sciences Journal 30 (Innovation Challenges in Multidiciplinary Research & Practice) ,pp.395-402.

Goh, T.-T. (2011). Exploring Gender Differences in SMS-Based Mobile Library Search System Adoption. *Educational Technology & Society*, *14* (4), 192–206.

Hair, J. F., Anderson, R. E., Tatham, R. L., & William, C. (1998). Black (1998), Multivariate data analysis.

Hakimpour, Farshad andZardiny, Ali, Z.(2014). Location Based Service in Indoor Environment Using Quick Response Code Technology. The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-2/W3, The 1st ISPRS International Conference on Geospatial Information Research, 15–17 November 2014, Tehran, Iran,pp.137-140.

Hloušková, R. and Šilhánková, V. (2014). Modern Technologies and Their Meaning for the Development of Non-traditional Forms of Tourism (an Example from the Broumov Region) 5th Central European Conference in Regional Science – CERS, 2014.

Human Service Solutions,LLC (2016). QR Codes for Marketing: A Unique Way to Bridge Offline and Online Media, Available at: https://www.hswsolutions.com/services/mobile-web-development/qr-code-marketing/, Accessed on 24/6/2016.

Johnson, G.J., Bruner, G.C., Kumar, A., 2006. Interactivity and its facets revisited. Journal of Advertising 35 (4), 35–52.

Kerry-Bedell, A. (2012). What opportunities do Quick Response (QR) codes offer to heritage organizations and how can their use help improve public appreciation of UK heritage sites?, IT’s in Conservation 2012.

Kim, S. (2011). Web-interactivity dimensions and shopping experiential value. Journal of Internet Business, (9), 1–25.

Kim, Y. G., & Woo, E. (2016). Consumer acceptance of a quick response (QR) code for the food traceability system: Application of an extended technology acceptance model (TAM). *Food Research International*.

Lee, P., Lusk, K., Mirosa, M., &Oey, I. (2016). Effect of information on Chinese consumers' acceptance of thermal and non-thermal treated apple juices: A study of young Chinese immigrants in New Zealand. Food Quality and Preference, 48, 118–129.

Lee, T. (2005). The impact of perceptions of interactivity on customer trust and transaction intentions in mobile commerce. Journal of Electronic Commerce Research 6 (3), 165–180.

Lee, Y.-H., Hsieh, Y.-C., & Hsu, C.-N. (2011). Adding Innovation Diffusion Theory to the Technology Acceptance Model: Supporting Employees' Intentions to use E-Learning Systems. *Educational Technology & Society*, *14* (4), 124–137.

Li, Junhao (2014). Tour Navigation: A Cloub Based Tourist Navigation System, Unpublished Master Thesis, School of Computer and Mathematical Sciences, Auckland University of Technology.

Martínez-Graña, A.M.; Goy, J.L.; and Cimarra, C.A. (2013). A virtual tour of geological heritage:Valourising geodiversity using Google Earth and QR code, Computers &Geosciences Elsevier Ltd, 61, pp. 83–93,

Meydanoglu, E. S. B. (2013). QR code: an interactive mobile advertising tool. International Journal of Business and Social Research, 3(9), 26-32.

Mostafa, A.A. (2014). The effectiveness of Product Codes in Marketing, International Conference on Strategic Innovative Marketing, IC-SIM 2014, September 1-4, 2014,Madrid, Spain.

Narayanan, A. S. (2012). QR codes and security solutions. International Journal of Computer Science and Telecommunications, 3(7), 69-72.

Nicolaou, A. I., & McKnight, D. H. (2006). Perceived information quality in data exchanges: Effects on risk, trust, and intention to use. *Information Systems Research*, *17*(4), 332-351.

Nielsen (2014). Smartphone Milestone: Half of Mobile Subscribers Ages 55+ Own Smartphones. Retrieved April 13, 2016 from http://www.nielsen.com/content/corporate/us/en/insights/news/2014/smartphone-milestone-half-of-americans-ages-55-ownsmartphones.html

Nunnally, J. C. and Bernstein I. H., (1994), Psychometric Theory, 3rd Edition (McGraw-Hill, New York).

Olsher, S. (2012). Internet prophets " The World's Leading Experts Reveal How to profit Online" , Morgan James Publishing , New York.

Park, S. Y. (2009). An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use e-Learning. Educational Technology & Society, 12 (3), 150–162.

Pasque, R. and Elkin, N.(2013). Mobile Marketing "An Hour a Day", John Wiley & Sons, Inc., Indianapolis, Indiana.

Pitney Bowes Inc.(2012). Getting ahead of the emerging QR Code marketing Trend, Stamford, USA. (A Pitney Bowes White Paper).

Probst, A. (2012). The expectations of quick response (QR) codes in print media: An empirical data research anthology. UW-L Journal of Undergraduate Research, 15, 1-13.

Profound Ideation Inc.(2012). QR Code Marketing for your Local Business, Profound Ideation Inc. & ProfoundIdeation.com , available at: http://mobiletoronto.info/wpcontent/uploads/2012/11/Profound-QR_Code_Marketing_for_local_business-v31.pdf, accessed on : 20/2/2016.

Puhe, M., Edelmann, M., &Reichenbach, M. (2014). Integrated urban e-ticketing for public transport and touristic sites. European Parliament/STOA–ETAG, Brussels.

Querini, M., Grillo, A., Lentini, A., Italiano, G. F. (2011). 2D COLOR BARCODES FOR MOBILE PHONES, International Journal of Computer Science and Applications, Vol. 8 No. 1, pp. 136 – 155.

Rese, A., Screnie, S., &Baier, D. (2014). Technology acceptance modeling of augmented reality at the point of sale. Journal of Retailing and Consumer Services, 21, 869–876.

Rolando, A., &Scandiffio, A. (2013). Mobile applications as tool for exploiting cultural heritage in the region of Turin and Milan. International Archives of the Photogrammetry, Remote sensing and Spatial Information Sciences, 5, W2.

Sago, B.(2011). The Usage Level and Effectiveness of Quick Response (QR) Codes for Integrated Marketing Communication Purposes among College Students. International Journal of Integrated Marketing Communications (IJIMC), Fall2011,Vol.3,No.2,PP. 7-17.

Shin, D.; Jung, J.; and Chang, B., (2012), The pychocology behind QR codes: User experience perspective, Computers in Human Behavior, Vol. 28, pp.1417-1426.

Stolzenbach, S., Bredie, W. L., Christensen, R. H., & Byrne, D. V. (2013). Impact of product information and repeated exposure on consumer liking, sensory perception and concept associations of local apple juice. Food Research International, 52(1), 91–98.

Tang, H. and Wang, S.(2012). Quick Response with QR Code in the Curriculum, available at:http://www.aect.org/pdf/proceedings12/2012i/12_22.pdf , accessed on: 21/2/2016.

Thorson, K. S., & Rodgers, S. (2006). Relationships between blogs as eWOM and interactivity, perceived interactivity, and parasocial interaction. Journal of Interactive Advertising, 6(2), 5-44.

Trail, Ceilidh and Scotia, Nova (2012). Assessment Findings and Suggestions Report, Destination Development International .

Turner, Jamie (2013). QR Code Mobile Marketing Ideas to Help Grow Your BusinessAvailable at: http://www.acromobile.com/success-stories-0/bid/254947/QR-Code-Mobile-Marketing-Ideas-to-Help-Grow-Your-Business, accessed on: 21/1/2016.

Unitag (2016). The 10 Commandments of QR codes, available at: https://docs.unitag.io/white_book/Ten_Commandments_of_QR_Codes.pdf, accessed on: 21/1/2016.

Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. Decision sciences, 27(3), 451-481.

Vichivanives, R. and Ralangarm, S.(2015). Temple Information Retrieval System using Quick Response Code via Mobile Application , 7th World Conference on Educational Sciences, (WCES-2015), 05-07 February 2015, Novote Athens Convention Center, Athens, Greece , by Elsevier Ltd., Procedia - Social and Behavioral Sciences 197 (2015) 998 – 1005.

Walter,E.(2016).10 Creative Ways to Use QR Codes for Marketing, Available at: http://mashable.com/2012/01/13/qr-code-marketing/#GfxRhfq_jiqB, accessed on: 21/1/2016.

Waters, J.(2012). QR Codes For Dummies, John Wiley &Sons,Inc., New York.

Weir, M.(2010). QR Codes & Mobile Marketing for the Small Business Owner: Connecting Merchants With Their Customers, Michael Weir, printed by CreateSpace .

Winter, M.(2010).Scan Me: Everbody's Guide to the magical world of QR Code , Westsong Publishing , California.

Winter, M.(2014). Unseen Napa: QR Codes as Virtual Portals In Brabazon Tara(ed.) , City Imaging: Regeneration, Renewal and Decay, GeoJournal Library 108, Springer, New York.

Wolff, Annika; Mulholland, Paul; Maguire, Mark and O'Donovan, Danielle (2014). Mobile technology to support coherent story telling across freely explored outdoor artworks. In: Advances in Computer Entertainment,11-14 Nov 2014, Madeira.

Zhao, L., & Lu, Y. (2012). Enhancing perceived interactivity through network externalities: An empirical study on micro-blogging service satisfaction and continuance intention. Decision Support Systems, 53(4), 825-834.

Zhang, Mu; Yao, Dan; and Zhou, Qian (2012). The Application and Design of QR Code in Scenic Spot's eTicketing System -A Case Study of Shenzhen Happy Valley , International Journal of Science and Technology , Volume 2 No.12 ,pp.817-822.