Using Smart Posters in the Tourism Industry to Provide Guidelines for Its Optimization

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Abstract

This paper aims to investigate the coverage factor of smart poster application in tourism industry and also to offer solutions in order to optimize it via three different hypotheses. Current research covers Golestan province, Iran, with a 120 carried sample The survey was size. out in descriptive approach and applied general researcher-made questionnaire and public assessment to collect required The information collected information. through questionnaires got qualified and analyzed using the Mann-Whitney test to confirm or reject research hypotheses. Through discussion of any single theory, we came to the conclusions that, first, necessary infrastructure for smart poster application in Golestan province must be evaluated and then provided with required equipment; second, people's IT literacy for smart poster application in the tourism industry must be assessed and then remedied via education and training; Finally, the coverage factor of smart poster application among Golestan domestic tourism industry must be estimated and then improved through education and training of natives with respect to their IT literacy.

Key-words:

Tourism; Near Field Communication (NFC); Smart Posters; Applying Smart Posters in Industry Tourism.

1. Introduction

Today, tourism has become the world's most diverse and largest industry - as a socio-economic phenomenon and of the main sources of income in every country (Bashiri 1390: 4). Certainly, the most important factor to accelerate the distribution of tourism is applying information technology. IT affairs provided ontime access to information regarding the facilities and accommodations everywhere (Yaari and Vazifehdust, 1386: 3). ICT plays a major role in the traveling and hospitality for tourism industry. Integration of ICT into the tourism industry is essential to the success of tourism companies (Bethapudi, 2013: 67).

This paper aims to investigate the coverage factor of smart poster application in tourism industry and also to offer solutions in order to optimize it via answering three hypotheses, namely:

1. There is any significant difference between required technologic equipment and infrastructure to apply smart posters in tourism industry, and existing facilities in Golestan province. 2. There is any significant difference between required human resources to apply smart posters in tourism industry, and existing human resources in Golestan province.

3. There is any significant difference between related technologic fields to apply smart posters in tourism industry, and the coverage factor of smart poster application among Golestan natives.

2. Review of Literature

A Framework for implementing NFC smart posters is proposed in a city in Thailand to provide people an easy way to access the benefits of NFC technology. The NFC smart posters application could provide tourist information, coupons and promotions, maps, and city events calendar. The results of this research can be applied for an actual implementation of NFC smart posters for providing various attractive services to users to enhance their experience. Moreover, this paper can be a guideline for ICT project implementation(Songkhla,2015).

Additional Use Cases for NFC Smart Posters can be listed as Parking services, Education, Elderly service meal orders, Remote worker reporting, Weather, Events, and Taxi ordering. To enrich the visitor's experience at the Monaco Museum, NFC tags were placed near selected, Shopping Assistant–Slovenia, First Use of Mobile Coupons, Promotions, and Payment Together–Taiwan, Location-Based Personalized Coupons and Promotions – Bangalore, India (NFC Forum, 2011).

Prepaid Card Sign-up–Kuwait, a leading bank in the Gulf Region started an NFC Smart Poster trial in February 2010, which enabled NFC device holders to sign up for a prepaid card application by waving a phone in front of the touchpoint. The phone then communicated with the server over the air and downloaded a personalized VISA Prepaid Card. This innovative application has increased the cardholder base (NFC Forum,2011).

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3. Theoretical Background

The definition of tourism: The World Tourism Organization defines tourism as activities such as traveling to places outside common locality and reside there for less than one consecutive year for leisure, business and other purposes (Sharafuddin, 2015).

Types of tourism: There are different types of tourism; some of them can be explained as follow:

 \blacktriangleright Wildlife Tourism: In this type of tourism, tourists travel to different cities and countries to watch domestic and wild animals; for example, India has a rich forest cover which has some beautiful and exotic species of wildlifesome of which are even endangered and very rare. This has boosted wildlife tourism in India (T & A, 2013).

Market Tourism: In this type of tourism, tourists travel for business, shopping, and selling goods (Karamipour, 1391).

Religious and Pilgrimage Tourism: this type of tourism is one of the most common types all over the world. Every year, religious places, shrines, sanctorum and holy places attracts numerous tourists throughout the world (www.Isfahancht.ir).

Sustainable Tourism or Ecotourism: Sustainable tourism describes activities that take advantage of natural resources or other natural or cultural attributes while promoting local economic development and avoiding damaging environmental impacts (D. Platzer, 2014).

▶ Rural Tourism: According to Eurostat (1998) rural tourism "regards the activities of a person travelling and staying in rural areas (without mass tourism) other than those of their usual environment for less than one consecutive year for leisure, business and other purposes (Kruja, Gjyrezi, 2011).

Wellness tourism: Wellness tourism is one of the fastest growing forms of international and domestic tourism. This form of tourism involves people who travel to a different place to pursue activities that maintain or enhance their personal health and wellness, and who are seeking unique, authentic or location-based experiences. Wellness tourism include massage, body treatments, facial treatments, exercise facilities & programs, weight loss programs, nutrition programs, pre- and post-operative Spa treatments and mind/body programs (T, A, 2013). Cultural Heritage Tourism: This form of tourism is defined by the National Trust for Historic Preservation as travel to experience the places and activities that authentically represent the stories and people of the past and present (D. Platzer,2014)

Marine Tourism: All kind of activities that tourist do for enjoyment and recreation in aquatic environment including rivers, lakes, dams, wetlands, lagoons, and sea beaches and offshores, are called marine tourism (www.tourismiran.ir).

Sport Tourism: This type of tourism intended for exercising special sports or international competitions (Kara mipour, 1391).

Adventure tourism: According to travelindustry-dictionary adventure tourism is "recreational travel undertaken to remote or exotic destinations for the purpose of exploration or engaging in a variety of rugged activities". Programs and activities with an implication of challenge, expeditions full of surprises, involving daring journeys and the unexpected. Climbing, caving, jeep safaris are examples of adventure tourism(Kruja, Gjyrezi, 2011).

Culture Tourism: culture tourism emphasizes on cultural attractions which are different in nature, including museums, exhibitions and so on (www.Isfahancht.ir).

Space Tourism: space tourism is a new trend in tourism industry that currently is limited to Russia Space Agency for sending volunteers to International Space Stations (Karamipour, 1391).

Electronic Tourism: This form of tourism includes information as well as traveling virtually through cyberspace (Karamipour, 1391).

4. Positive Effects of Tourism Industry

Tourism industry brings about positive effects and enhancements, namely: increase in income or improved standard of living, new job opportunities and economic resources for local people, to enrich tourism industry facilities and infrastructure, increase tax income, boost tourists' information and also finance resources for natural and cultural heritage, revival of local traditions and folklore, inflate national dignity and confidence, providing finance, experts skills and management tips transmission, markets interrelation, preservation and restoration of archeologic sites, ancient buildings and monuments. (U.N.C.T.A. D., 2010) & (Agbaly, Bakhshandeh-Nosrat & Seyedalipour, 2011) & (Davies and Cahill, 2000).

5. Near Field Communication

Near field communication (NFC) is a wireless connectivity technology that allows embedded NFC chips to send encrypted data over a short distance to a reader (Nandwani, Crane, Edwards, Benachour ,2012). NFCbased communication between two devices is possible when one device acts as a reader/writer and the other as a tag (Forum.Nokia, 2011). According to Fig. 1, the tag is a thin simple device containing antenna and small amount of memory. It is a passive device, powered by magnetic field. Depending on the tag type the memory can be read only, re-writable, and writable once (Forum.Nokia, 2011).



Fig. 1 Near Field Communication Tags (Source: Forum, Nokia, 2011:5)

NDEF is a data format to encapsulate and identify application data that is exchanged between NFC-enabled devices. The NFC Type Tags are contactless cards based on currently available products capable of storing NDEF formatted data (Gallo, 2011).

6. Smart poster

The Smart Poster is one of the key use cases for NFC technology. The idea is that an object can be made "smart", i.e., it is capable of storing additional information about itself in the form of an NFC Forum Tag. By touching an NFC Forum Device to the tag, this information can be read and displayed to the user (NFC Forum, 2006). According to Fig. 2, the lable 'N' shows the touch place in smart posters for useing near-field communications technology (Gupta, 2011).



Fig. 2 Near Field Communication Lable (Source: https://en.wikipedia.org)

An NFC Smart Poster is relatively easy to manufacture, and its ingredients are already commercially available. To produce a Smart Poster, you will need:

An object (e.g., a plain poster, statue, etc.)

> An NFC tag encoded in the NDEF format

➤ A touchpoint indicator (ideally the NFC Forum N-mark) that indicates where to touch an

NFC device to the NFC Smart Poster to get the best user experience

An NFC Reader/Writer, capable of writing NDEF formatted tags, to program the content

A content provider(NFC Forum,2011).

The Smart Poster is made by a surface behind which several smart tags (NFC tags) are pinned to be read by the latest generation smartphones. The solution also involves a server and one or more screen displays. Each NFC tag on the poster directs to a URL, which is mapped to a different server resource. By tapping on a tag with a NFCenabled smartphone, a request is sent to the server, which controls the contents and takes two actions: it replies with the appropriate resources to the smartphone client and it also displays related, additional contents on the screen, or alternatively it may trigger an action on a connected device, like opening a door o printing a paper (Frisiello, Lotito, Luca Spoto, Macchia).

Figure 3 below shows how a user requests and gets a response from a smart poster. The user sends a request for NFC label on the smart poster via his/her mobile cellphone;Next, the NFC label Tags (that is like a key through which the user can access to desired information) together with the relevant web address (where the user can find his/her requested information) is sent back to the user. Then, the cyberspace services are available for the user through his/her NFC Tags and website address. Smart poster technique is a new strategy which has developed by near field communication system and shows how to save a cellphone number, SMS or web address in a NFC tag and share them

between different devices (Nandvany, bound and Edward and Banachavar, 2012).



Fig. 3 The process of requesting using smart posters (Source: Nandwani, and et al, 2012 : 2)

like other countries, Iran truism industry can benefit from smart posters. As a sample, we have extended deapplication of smart poster for a holy shrine in the city of Gorgan. Our draft of a smart poster for a holy shrine of Emamzadeh Eshagh is illustrated in figure 4. Provided that the required hardware and software facilities be ready, it works as follows: If you reach your mobile cellphone to the 'history' section of the smart poster, it will guide you to the associated webpage by displaying that link on your mobile cellphone screen. Otherwise, if you hold the cellphone near the 'donation' section of the smart poster, it sends you a SMS that contains a bank account number and asks how much you want to donate? Other sections of the smart poster make the telephone numbers and e-mail address available.



Fig. 4 a smart poster draft. (Source: the background image adapted from : http://www.makanbin.com/golestan)

7. Research Methodology

The survey was carried out in descriptive approach and applied a researcher-made questionnaire to Golestan natives in order to collect required information; so Golestan natives make statistical sample society. as table 1 shows, applying random sampling method, is used people of Golestan province natives 120 were randomly selected to answer the general questionnaire and public assessment survey. In order to collect required information current study adopted library method and consulted internet website. The general researcher-made questionnaire contains 7 questions on research subject matter, in order to deliberate existing equipment and infrastructure in Golestan province. iran. The questionnaire aims to find out how much smart poster apply in tourism industry. The questionnaire contains 21 close-ended 6 choice (i.e. very high, high, moderately, low, very low) questions.In order to determine the validity of the questionnaire and whether the results of the study answer the study questions coherently, current study consulted some experts in educational technology and computer specialists; and also a reliability coefficient

of 0.90 for public assessment survey was achieved. We analyzed obtained data through descriptive statistics approaches (frequency calculation, frequency distribution table, etc.) and explained statistical hypothesis via Mann-Whitney test.

Table 1: population sample in terms of gender

Sex			
Female	Male		
42	78		

8. Research findings

Hypothesis 1 test: Is significant there any difference between required technologic equipment and infrastructure smart posters in apply to tourism industry, existing facilities in and Golestan province?

First hypothesis test: The first seven questions of the general researcher-made questionnaire designed for the first research hypothesis. It examined the technologic facilities and infrastructures required for smart poster application among people. The answer to these yes/no questions coded into numbers (i.e. 1 &2).

First hypothesis answer: as table 2 shows, applying Mann-Whitney test (p<0.05), current condition is 60.50 but desired condition should be 180.50. Therefore, it concludes that the technologic facilities and infrastructures required for smart poster application is not sufficient; there is a meaningful gap between current condition and desired condition, i.e. existing facilities doesn't suffice for applying smart posters in tourism industry of Golestan.

Table2: Analysis of the first hypothesis test

Mann-Whitney test						
	Rankings					
	status 1	number of persons	average ranking	total ranking		
Hypothesis	Current condition	120	60.50	7260.00		
1	desire d condition	120	180.50	21660.00		
	Final	240				
	statis	tics test				
			Hypothesis 1			
Mann-Whithney U		0.000				
Wilcoxon W		7260.000				
Z		-15.460				
Asymp. Sig. (2-tailed)		0.000				

Hypothesis 2 test: Is there any significant difference between required human resources to apply smart posters in tourism industry, and existing human resources in Golestan province?

Second hypothesis test: The next ten questions of the general researcher-made questionnaire designed for the second research hypothesis. It deals with required human resources and their IT literacy in using smart posters in tourism industry. Questions are multiple-choice, asking for "never", "rarely", "sometimes", "often" and "always" responses which then coded into numbers 1 to 6.

Second hypothesis Answer: as table 3 shows, Mann-Whitney test (p<0.05), determined current condition is 61.50 but desired condition should be 179.50. Accordingly, Golestan people are not IT educated enough to use smart posters, so there Is significant difference between required human resources to apply smart posters in tourism industry, and existing human resources in Golestan province.

Table 3: Ana	lysis o	of the seco	ond h	ypothesis test

Mann-Whitney test					
Rankings					
	status 2	number of persons	average ranking	total ranking	
	Current condition	120	61.50	7380.00	
Hypothesis	desired	120	179.50	21540.00	
2	condition				
	Final	240			
	statisti	cs test			
			Hypothesis 1		
Mann-Whithney U			120.000		
Wilcoxon W			7260.000		
Z			-14.078		
Asymp. Sig. (2-tailed)		0.000			

Hypothesis 3 test: Is there any significant difference between related technologic fields to apply smart posters in tourism industry, and the coverage factor of smart poster application among Golestan natives?

The third hypothesis test: The questions 9 to 19 of the general researcher-made questionnaire designed for the third research hypothesis. It studies related fields to smart poster technologies in truism industry and its popularity. Questions are multiple-choice, asking for "never", "rarely", "sometimes", "often" and "always" responses which then coded into numbers 1 to 6.

Third hypothesis Answer: as table 4 shows, Mann-Whitney test (p<0.05), determined current condition is 60.50 but desired condition should be 180.50 Consequently, it concludes that the amount of related fields application to smart poster technologies in truism industry is not sufficient, so, there is a significant of related difference between current condition technologic fields smart posters in to apply tourism industry among Golestan natives and its desired condition.

Table 4: Analy	sis of the	third hyp	oothesis test

Mann-Whitney test					
Rankings					
	status 3	number	average	total	
		of	ranking	ranking	
		persons			
	Current	120	60.50	7260.00	
Hypothesis	condition				
3	desire	120	180.50	21660.00	
	d condition				
	final	240			
statistics test					
		Hypothesis 1			
Mann-Whithney U		0.000			
Wilcoxon W		7260.000			
Z		-14.320			
Asymp. Sig. (2-tailed)		0.000			

9. Conclusions and Suggestions

Hypothesis 1: current study showed that there Is significant difference between required technologic equipment and infrastructure apply to smart posters in tourism industry, and existing facilities in Golestan province. Therefore, existing facilities doesn't suffice for applying smart posters in tourism industry of Golestan. It is better to provide people necessary facilities and infrastructures in order to access the benefits of smart posters; so that they could enjoy smart posters in order to read the website addresses, cellphone numbers, messages, e-mails, and maps, and also to buy tickets via their mobile cellphone. Here, by necessary facilities and infrastructures we mean providing people Near Field Communication technology by mobile operators throughout the country, because NFC technology and smart tags are necessary for smart posters to apply. It is also better to enhance different kind of tourism, like culture tourism, business tourism, ecotourism, religious and pilgrimage tourism, adventure travel, sport tourism, wellness tourism, and rural tourism an easy access to smart posters; so that people could benefit smart poster services, like information and e-ticket access, by holding their mobile cellphones near smart posters.

Hypothesis 2: study results support the idea the there Is significant difference between required human resources smart posters in tourism industry, apply and to existing human resources in Golestan province. utilizing smart poster techniques requires educated human resources who are familiar with cellphone, smart poster technique, and their applications in tourism. Accordingly, we must schedule for the development of human resources and devote special affort to train people for using this technology in Golestan province. To apply smart poster technology as a new modern technology, requires educating people and make them familiar with the technology. utilizing smart poster techniques in Golestan province requires educated human resources who are familiar with cellphone, smart poster technique, and their applications in tourism.

Hypothesis 3: the results of the study affirmed that there is significant difference between related technologic fields to apply smart posters in tourism industry, and the coverage factor of smart poster utilization among Golestan natives and application of technologic fields related to smart posters is not common enough in tourism industry; therefore, according to second hypothesis above, relating IT literacy, we must pay special attention to human resources training and educate them to apply new techniques related to smart posters in tourism.

10. Suggestions

at the end of each study it is common to offer a series of suggestions that comes from research findings, which in turn is concluded from research hypothesis test. these suggestions contain research suggestions as well as researcher suggestions.

11. Research Suggestions

> according to study results following suggestions are recommended:

➢ providing required facilities and infrastructures in order to apply smart poster technology in tourism industry; at the first step, any necessary equipment and structure for using smart posters in tourism industry must be supplied throughout Golestan province.

> IT literacy: at first, the IT literacy level of Golestan province people must be testified; then if it is necessary, we must afford to make people familiar with this technology and educate them to apply new techniques related to smart posters in tourism.

To increase smart posters related fields application rate: in order to achieve this goal, it is necessary, beforehand, to enhance people IT litracy; so that, it could help to increase smart posters related fields application rate in Golestan province tourism industry.

12. Researcher Suggestions

> we must detect the places all through Golestan province that require the application of smart poster technology; then, depending on their public or private status, we must supply them with required infrastructures and equipment.

At the first step, we must testify the IT literacy level of people; then if it is necessary, we must educate and make them familiar with smart poster technology equipment.

> If people IT literacy level increases, their application rate of smart poster related fields and technology increases too; therefore, we emphasize again on the importance of IT literacy for tourism industry.

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