

A Structural Model for Sustainable Urban Elements, Information Technology Use, and Cultural Communications in Tourism Industry

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Abstract

One of the most important spaces that are of interest to tourists is cities which are known as the centralized hub for tourism attraction. Meanwhile, what can have very effective role in tourism development and tourist attraction are urban symbols and elements. In this regard, paying attention to the urban elements and their design based on the principles of sustainability can create more attraction for tourists. In this study, we investigate the effects of urban elements on information technology use, and cultural communications in the tourism industry, and present a structural model for them by using structural equation modeling (confirmatory factor analysis and path analysis). Participants were Iranian Experts in the field of IT, tourism, and cultural sciences (N=60) selected from tourism organizations in Iran. Results of our hypothesized measurement models indicated the accuracy of studied parameters in measuring the studied factors and their significant estimates ($t\text{-value} > 1.96$, $p < 0.05$). Structural model of the study revealed that sustainable urban elements has significant effects on information technology use, and cultural communications of tourists ($p < 0.01$).

Keywords: tourism industry, information technology, and cultural communications, sustainable urban elements.

1. Introduction

In the current era, the importance of tourism in the field of economic and entrepreneurship is to the extent that it can be considered as the driving force of any country. Tourism has many advantages and has become an important source for employment, because employment in this industry does not require high skill and training, and local people with a little skill can work in its service jobs (Brown, 2003). Tourism industry has grown so much to the extent that tourism activities are now as part of human activities such that is called “invisible export” (Movahed, 2002). Tourism acts within the framework of special spatial patterns. One of these patterns is urban tourism (Faraji Rad and Seyyed Nasiri, 2010). Since urban areas have high historical and cultural attractions, they are often considered to be important and attract many tourists (Hall, 2001). Each of the cities in the world has their own form, structure and function. In each city there are different factors that cause attraction and retention in the minds of tourists including access to facilities and services, comfort, visual appeal of the city, liveliness, diversity and heterogeneity. Among these, the role of urban elements and symbols in boosting urban tourism is of great importance.

Urban elements are a major component of urban furniture that can promote a sense of place and identity of the citizens. They are space that evokes memories of the city for people and cause the durability of the cities in the minds of tourists at different times. Generally, the effect of the urban elements on developing the tourism can be summarized as (1) definition of a unique symbol for the city according to its identity, (2) Introducing the event or the memory of the city, (3) creating a favorable and beautiful environment, and (4) creating a vivid mental image of urban spaces. Urban elements have different types including visual, expressive, functional urban elements or a combination of these types (Mabhout et al. 2013).

Another factor to revive the tourism industry is the use of Information Technology (IT). IT is an essential element of the external environment in the tourism industry, the development of which in recent years has led to innovations in the industry. The use of IT in the internal networks of tourism industry increase their efficiency and effectiveness. Furthermore, its use may lead to an increasingly correlation among numerous different activities of tourism industry such that the use of IT tools in the form of Computer Reservations System (CRS), Global Distribution System (GDS) and Destination Marketing Services (DMS) in air transportation industry, hotels, and travel services has greatly developed (Parveneh et al. 2009). According to Granville et al (2001), ICT is the use of concepts, techniques, algorithms and models to process, store and retrieve information in the most desirable and most secure conditions. Nowadays, since the traditional system wastes a lot of time and cost online travel planning is growing. According to Global Market Insite (GMI) survey in 2005, 69 % of people in Korea, 65 % in UK and China, 64% in France, and 62% in Italy, choose their destination for travel and tourism through internet. Also it was reported that in Europe 80% of hotels have website; in Austria, above 90% have website, 63 % of hotels support online sales, and 73 % online requests (Werthner, 2006). Some studies have

revealed the effects of information technology on tourism industry (e.g. Buhalis, 1998; Buhalis and Law, 2008; Büyüközkan and Ergün, 2011; Aldebert et al. 2011; El-Gohary, 2012).

Cultural communication is another effective factor in tourism. With so many tourists spending time abroad every year it is a logical consequence that different culture groups meet. In this case difficulties may occur. It is not only the language which is different and causes troubles and misunderstandings in communication; attitudes and the way people think vary greatly. They have to face their upcoming cultural communication challenges (Vellnagel, 2010). Cultural communication refers to a process of direct interpersonal communication, which occurs between people with different cultures. The contact with other cultures may change the way tourists perceive. Cultural communication experiences help tourists to know and to appreciate other cultures, but also help them to a better understanding of their own culture (Albu, 2015) in the process of cultural communication, tourists from different cultures can negotiate their cultural identities, rules of meaning, and perception. They can discuss about development of urban public sphere, increasing cultural cooperation, peaceful coexistence, exchange of cultural elements, and diversity of cultural contacts. For a sustainable development of the tourism industry, communication in all sense between all tourists has become a key element. Considering above materials, in this study our aim is to evaluate the effects of sustainable urban elements on IT usage and cultural communication in tourism industry. For this purpose, structural equation modeling (SEM) was used.

2. Materials and Methods

This study in an experimental applied research conducted to investigate the effectiveness of IT applications and cultural communication in tourism industry by using sustainable urban elements. Participants were 60 Iranian experts in IT (N=20), tourism (N=20), and cultural sciences (N=20) selected randomly from twenty tourism organizations in Iran. After reviewing the previous studies regarding the important factors in tourism industry with respect to the IT and cultural issues, the studied variables were listed as shown in table 1. In order to assess the variables, a Persian-language questionnaire was designed which 14 items had scaled based on likert scale. The first part of the questionnaire measures the subjects' demographic characteristics. The second part evaluates factors in three sections: items 1-4 measure urban elements variables, 5-9 is about IT variables, and questions 10-14 assess cultural communication variables.

Table 1. Studied factors

Urban elements variables	IT variables	Cultural communication variables
Functional elements, Visual elements, Mixed elements, Expressive elements	Development of tourist sites, Guidance and reception systems, Global Positioning Systems, Local Information Network	Urban public development, Cultural cooperation, Peaceful coexistence, Exchange of cultural elements, Diversity of cultural contacts

We hypothesized that:

- H1. Urban elements has significant effects on cultural communications in the torism industry;
- H2. Urban elements has significant effects on IT use in the tourism industry;

To test whether the data fit our hypothesized model, Structural Equation Modeling (SEM) including confirmatory factor analysis using maximum likelihood equation were performed in LISREL software.

3. Results

3.1. Characteristics of participants

Results reported that participants were 34 male and 26 female, with an average age between 30-40 years. Most of them had work experience more than 7 years (60%).

3.2. Structural Equation Modeling

A. Measurement models

SEM is a comprehensive statistical method to test the hypotheses about the relationship between the observed variables and latent variables. It includes. In SEM analysis, first it is necessary to study construct validity to determine whether the selected indicators have enough precision for measuring the considered constructs. For this purpose, confirmatory factor analysis (CFA) is used. "Maximum likelihood" method was used in CFA. In CFA, the factor loading of each indicator with its construct should have a t-value above 1.96 to have enough precision for measurement of the construct or the latent variable (to be significant at the 0.05 level). Results of measurement model for three factors or constructs (IT usage, cultural communication, and sustainable urban elements) are presented in Tables 1 to 3. There are many measures of fit for evaluating CFA model. In this study, indicators X2, root mean square residual (RMR), Standardized Root Mean Square Residual (SRMR), adjusted goodness-of-fit Index (AGFI), Normed fit index(NFI), Non-normed fitness-of-good index (NNFI), incremental fit index(IFI), comparative fit index (CFI) and the root mean square error of approximation (RMSEA) were measured (see table 4).

Table 1. Results of measurement model for sustainable urban element

Constructs	Parameters	Symbol	Path coefficient	t	Chi-square	df	p-value
Sustainable urban elements	Functional elements	EL1	0.64	14.20	0.88	1	0.34890
	Visual elements	EL2	0.66	15.36			
	Combined elements	EL3	0.68	14.49			
	Expressive elements	EL4	0.66	15.62			

Table 2. Results of measurement model for cultural communication

Constructs	Parameters	Symbol	Path coefficient	t	Chi-square	df	p-value
Cultural communication	Urban public development,	CC1	0.62	13.69	0.81	3	0.84737
	Cultural cooperation,	CC2	0.63	14.39			
	Peaceful coexistence,	CC3	0.61	15.74			
	Exchange of cultural	CC4	0.58	15.15			

	elements,						
	Diversity of cultural contacts	CC5	0.48	12.36			

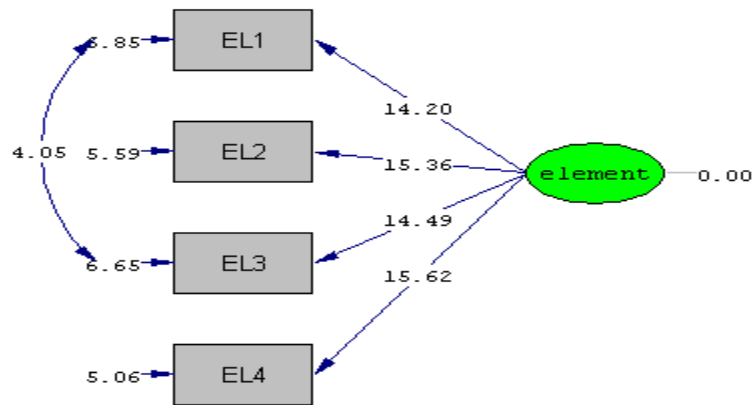
Table 3. Results of measurement model for IT usage

Constructs	Parameters	Symbol	Path coefficient	t	Chi-square	df	p-value
IT	Development of tourist sites	IT1	0.62	15.58	1.17	2	0.55767
	Guidance and reception systems	IT2	0.58	16.56			
	Global Positioning Systems	IT3	0.61	16.39			
	Local Information Network	IT4	0.45	11.66			

The measurement model for *sustainable urban element* reported *chi-square* of 0.88 on 1 degree of freedom with a *p-value* of 0.34 (See table 1). Also, its Root Mean Square Error of Approximation (RMSEA) was 0.000 (See table 4) which indicates that the measurement model of the sustainable urban elements has best fit. Its significant parameter estimates (*t-values*) were above 1.96 which indicates parameter estimates are significant at the 0.05 level and they are enough accurate to measure the construct (sustainable urban element). Therefore, the relationship between latent variables and their indicators is reliable (see Fig. 1).

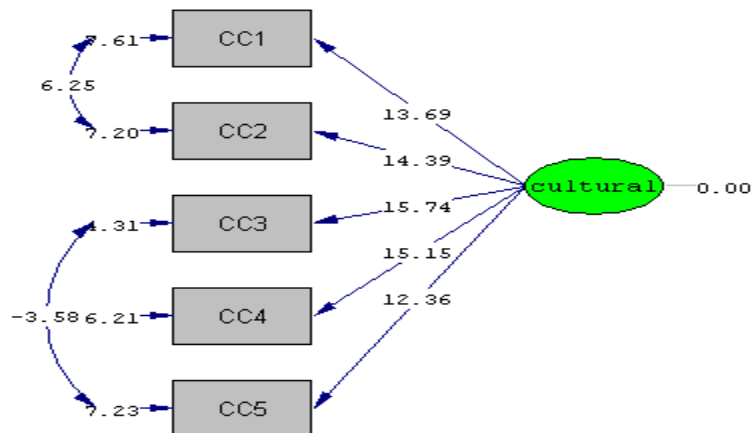
The measurement model for *cultural communication* had *chi-square* of 0.81 on a 3 degree of freedom with a *p-value* of 0.84 (see table 2), and its RMSEA was 0.000 (see table 4) which shows its acceptable fit. Its *t-values* were above 1.96 which indicates parameter estimates are significant at the 0.05 level and they can measure the *cultural communication* accurately. Hence, there is relationship between latent variables and their indicators (see Fig. 2)

The measurement model for *IT use* reported *chi-square* of 1.17 on a 2 degree of freedom with a *p-value* of 0.55 (see table 3), and its RMSEA was 0.000 (see table 4). This indicates that this model has acceptable fit. *T-values* showed that parameter estimates are significant at the 0.05 level ($t > 1.96$), and they can measure the *IT use* and therefore, latent variables and their indicators had significant relationship with each other (see Fig. 3).



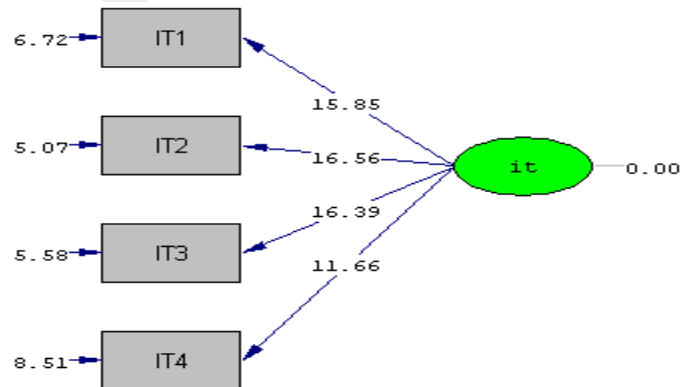
Chi-Square=0.88, df=1, P-value=0.34890, RMSEA=0.000

Figure 1. Path diagram and significant parameter estimates for measurement model of sustainable urban element



Chi-Square=0.81, df=3, P-value=0.84737, RMSEA=0.000

Figure 2. Path diagram and significant parameter estimates for measurement model of sustainable urban element



Chi-Square=1.17, df=2, P-value=0.55767, RMSEA=0.000

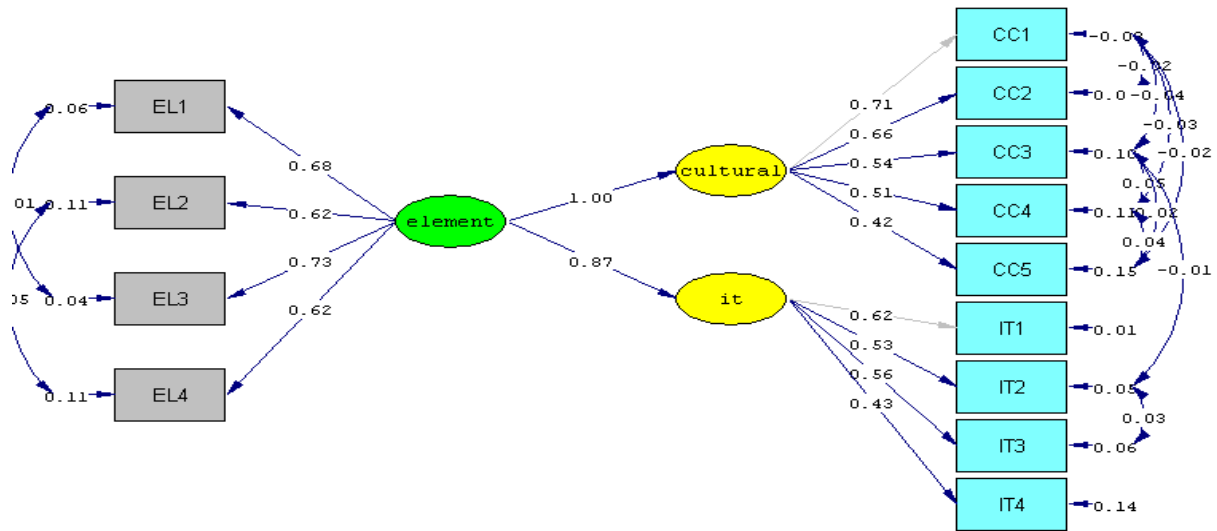
Figure 3. Path diagram and significant parameter estimates for measurement model of sustainable urban element

Table 4. CFA indices of fit for the measurement models

Index	Estimated value		
	Sustainable urban elements	Cultural communication	IT use
RMR	0.001	0.001	0.002
SRMR	0.002	0.003	0.005
GFI	1	1	1
NFI	1	1	1
NNFI	1	1	1
IFI	1	1	1
CFI	1	1	1
RMSEA	0.000	0.000	0.000

B. Structural model

After the confirmation of the measurement model, now we assess the relationship among the constructs, and present the final model or structural model. Since RMSEA value was less than 1.0 for the measurement models, to accurately determine the path coefficients for testing the research hypotheses, there is no need for modification. Figure 4 shows the path diagram for the structural model after fitting. Measures of fit were calculated as shown in table 5. As can be seen, these measures show that the structural model has acceptable fit, and the final model has a high reliability. Figure 5 depicts significant parameter estimates for the structural model. T-values are higher than 1.96 and therefore, parameter estimates are significant at the 0.05 level; hence, we can say that sustainable urban elements had significant effect on cultural communication and IT usage in tourism industry. Table 6 shows the results of the relationship between sustainable urban element, cultural communication, and IT use.



Chi-Square=95.96, df=52, P-value=0.00020, RMSEA=0.073

Figure 4. Path diagram for the structural model – Relationship between sustainable urban element, cultural communication, and IT use

Table 5. CFA indices of fit for the structural model

Index	Acceptable level	Estimated value
RMR	Approximately 0	0.013
SRMR	Approximately 0	0.031
GFI	> 0.9	0.92
NFI	> 0.9	0.98
NNFI	> 0.9	0.99
IFI	> 0.9	0.99
CFI	> 0.9	0.99
RMSEA	<0.1	0.073

4. Conclusion

Urban elements usually represent an artistic reflection, events, and memories of people, beliefs and ideals for any society. In some cases, these urban elements have been considered as social and cultural symbol; however, despite the existence of numerous urban elements in today's cities, especially in Iran, unfortunately, we are witnessing a series of elements designed based on a process without having a specific purpose and principles of sustainable design. This has caused the urban elements and symbols not to be able to play their roles in cities properly. Considering the growth of tourism industry, designing appropriate urban elements is of great importance. The aim of this study was to investigate the effects of sustainable urban elements on cultural communication, and IT use in tourism industry. By conducting SEM analysis we found out that sustainable urban elements have a significant effect on cultural communication ($p\text{-value} < 0.01$). Also, results showed that sustainable urban elements have a significant effect on IT use ($p\text{-value} < 0.01$). Overall, we concluded that there is a significant relationship between sustainable urban element, cultural communication, and IT use in tourism.

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