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Electronic Payments; a Step towards Reducing Intra-Town Trips and Sustainable Urban Architecture (Case Study: Yazd Township)

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ABSTRACT: The quick growth of the population of the country and the subsequent growth in urban development cause an increase in population concentration, environmental pollution, traffic load, and consequently, in time waste. Amongst the demands of urban population, solving the problem of traffic and transportation is of great significance. Therefore, employing strategies to reduce the load of traffic in cities seems necessary. Information and Communication Technology is one of these strategies, which has currently substituted physical intra-town trips with electronic trips, and by such substitution, some countries have saved millions of dollars which was to be spent on building new passages and high ways. Hence, the present study aims to investigate the effect of electronic payments on reduction of intra-town trips. Research population consists of three neighborhoods of Yazd Township that were selected via clustering analysis. Inferential statistics including Spearman Correlation was used for data analysis. The results of the study show that there is a significant correlation between electronic payment and reduction of intra-town trips, and subsequently consolidation of urban architecture.

Keywords: Information and Communication Technology, intra-town trips, electronic payments, Yazd Township

ORIGINAL ARTICLE

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INTRODUCTION

Stating the problem

During the past several decades, with development of communication tools, the load of electronic activities has increased within cities, and due to the increase in speed, accuracy and security of the activities, countries have become more inclined to employ this technology, the result of which has been the formation of electronic governments and cities, whose main objectives are providing citizens with urban services more easily, reducing the load of transportation in cities, saving the time, and fulfillment of social justice for all classes of the society. This is more significant for big cities because of the existence of pollution and traffic. Since in most urban services provided for the citizens, there is the need for exchanging money which includes a huge portion of urban transportations, electronic cards, and particularly credit cards, which are responsible for performing majority of activities in an electronic city, were introduced to reduce people's physical attendance in organizations, and to be more inclined towards the new technology in urban activities. This is because these cards can function as money in every bank interactions.

Yazd, that is one of the metropolises of Iran and one of the historical cities of the world, has lately faced with the problem of traffic rush, and subsequently loss of urban beauty due to some factors such as the quick growth of the population, huge entrance of vehicles to the urban transportation system, and the increasing trend of immigration to this city on one hand; and the weakness in the structure of access networks, tendency of the people to use private vehicles, lowness of the culture of using public transportation and lack of awareness of benefits of doing so, and inappropriate public transportation systems (taxi and bus services) on the other hand. Today with the development of cities, the demand for daily commutes have become more and more. Every day, people lose their best times by standing in lines in bus stops, taxi stands, and also in traffic. Therefore, huge amounts of money are wasted as a result of depreciation of private vehicles and supplying fuel. Also mental and physical hurts, as well as biological damages to the environment, are no less important than the economical loss. In this respect, the approach of using ICT, which has been applied in transportation since the 80s, is considered (Giannopoulos, 2004). In this respect, using ICT and taking advantage of its consequences such as the internet and mobile phones can play an effective role in solving problems such as traffic and air pollution. Within the age of communications, by substituting physical movements with virtual movements and access, the load of demands for intra-town trips can significantly be reduced, and movements can become easier and less costing (Shahidi, 2005) Information technology enables us to keep direct and constant connection with desired places to remove our needs and to do our activities without any physical movement around the city (Anne, 2008).

The significance of the study

During the past years, the quick growth of developing cities has lead to certain problems such as

lack of residential units, high rate of unemployment, economical problems, poverty, marginalization, and environmental pollution, which in turn, result in inequality between the services and the equipments, and also lack of social justice in zonal and national level (Hazeri, 2010). It also causes an increase in demands for intra-town trips; and particularly in central parts of cities, traffic nodes in rush hours have become a complicated and unsolvable problem. Yazd Township is not excluded from this problem. Furthermore, it has been estimated that every citizen can annually prevent spreading of 100 Kg of CO2 simply by eliminating four short intra-town trips (Alemi, 2005). The most effective style of managing intra-town trips is managing demands for trips. Various policies have been proposed in this respect, one of which is using modern communication and information technologies. In some countries, substituting physical intra-town trips with electronic trips has made the city take advantage of the positive consequences of these technologies. Experiences of the successful countries in appropriate usage of ICT have confirmed results as saving time and money, reduction of driving hurts and causalities, and environmental controls due to reducing intra-town transportations (Nekuei, 2005). Therefore, employing this strategy in metropolises of Iran can reduce intra-town trips and their consequences.

Research background

Late second myriad A.D was corresponded with the emergence of a new technology called Information and Communication Technology. This technology, which first had military application, was globally introduced as a superior technology after its mega town application by Singapore (Abd Mojairy, 2007).

In Iran, Shahrokhi Yeganeh, in his M.S thesis in 2001, emphasized on one aspect of IT, the internet, and its role in reducing traffic problems in Tehran Township. Also Mamdouhi (2004) briefly investigated the role of ICT in managing demands for urban transportation (Soltani, 2006).

Soltani (2006), in his M.S thesis, investigated the role of ICT in reducing demands for intra-town trips in Isfahan (Soltani, 2006). In a paper in 2006, Heidari regards appropriating the urban environment with employing the policy of reducing intra-town trips as possible by integrating land applicability planning and transportation planning, and also by using and developing ICT (Heidari, 2006).

In his study in 2008, Nik Khalgh assesses the present electronic sources, particularly their application in domain of health; because an electronic city is not a physical place for work and recreation only; rather, it is a dynamic entity which affects its surrounding environment, and is interactively affected by it. He states that in the past, developing IT was restricted to scientific and scholar places. However, by the beginning of the third myriad, it has stabilized its significance in social life, and has gradually got its identity in certain cases such as electronic government, electronic instruction, and electronic health. This trend was regarded as a vital key role in governing countries, so that it is known as one of the main qualifications of the performance of every government. Access to electronic services is currently regarded as an urban right for people (Nik Khalgh, 2008).

In his study under the title of "Investigating the Role of Rural ICT Offices in Offering Services to Rural Areas in Isfahan Province," Hedayati Mghadam (2008) has investigated the role of ICT in rural development. This study shows that various factors can affect the successfulness of those offices. These factors include the amount of people's awareness of the services available in such offices, people's attitude towards the role of these offices, and the management strategies (Hedayati, 2008).

Research questions

✓What is the relationship between electronic payments and the amount so intra-town trips and consolidation of urban architecture?

✓What are the available strategies to extend and develop ICT in Yazd?

MATHERIAL AND METHODS

The present study is an applied research with descriptive-analytic approach, where the data has been collected through library and field work (questionnaire and interview). Research population includes people of Yazd Township. In order to conduct accurate study, two neighborhoods were randomly selected. The statistics of 2006 census was used for sampling, and EXCELL and SPSS software were used for data analysis. Clustering analysis method was applied to determine the size of the samples. According to this method, 192 questionnaires were required. It is noteworthy that the questionnaires were randomly distributed among 192 persons.

The area under study

With a longitude of 54:24 and latitude of 31:25, Yazd is situated in the centre of Iran, in the east of Isfahan and south of Loot Kavir. This township has an area of 87 Km^2 and an altitude of 1230 m. In terms of relative location, this township is situated within 310 Km in the southeast of Isfahan, and is the junction of Tehran-Bandar Abbas and Isfahan- Khorasan Roads. From the north, this township is restricted to Shahedie; from south to Hosein Abad, Rahmat Abad, Dehno, and Mehriz; from the east to Hosein Abad Moshir and foothills of Kharanagh; and from the west is restricted to Khezr Abad. This city has hot and arid climate with tropical winds, together with dust, blowing in certain seasons of the year. Annual temperature fluctuation of Yazd is about 59 °C, and the most important wind is that of northwest-southeast. According to the 2006 census, Yazd has 3 districts, 9 areas, and 45 neighborhoods; and its population is over 447259.

Research theoretical framework

Electronic city: Electronic city refers to people's electronic access to all departments within a city, which is 24- hour, and 7-day. This access must be constant, secure, and reliable (Mahmoudinia et al., 2010).

In such town, people are not required to spend much time on daily activities such as paying the bills,

buying tickets, etc.; rather, they can do all of these via their pc while being connected to the internet (Jalali, 2005).

Electronic city is a town, where citizens' required information and services are available throughout the day and night via web sites (Sarafrazi et al., 2009). Electronic city means using networks for quick and interactive provision and delivery of services to the citizens. Indeed, it means elimination of bureaucracy in departments. Finally, electronic city is a town, where all the time citizens have digital access to all departments, service-providing centers, information banks, and generally everything that a citizen may need, via information networks (Mousavi, 2009).

Electronic Government: The term "electronic government" first refers to the acceptance of Information and Communication technologies as the means of improving management and better provision of public services on the part of the government (Mohseni, 2007). Today, this term is said to the use of these technologies in order to improve the efficiency of information and comparability of information and financial interactions within the government, between the government and its affiliated organizations, between the government and the citizens, and between the government and the private sector (Safary et al., 2003). It can be said that electronic government is a practical innovation based on a huge transformation in the government, where the capabilities of IT form in three dimensions of integration, efficient management, and supporting development objectives of the government. This definition shows that an electronic government should set the stage for other applications of IT such as e-commerce, e-banking, and electronic instruction within a country (Zarei et al., 2009).

Information and Communication Technology: ICT is a set of hardware, software, and intellect, which makes the exchange of information and its exploitation possible. In short, the input of this technology is the data, its engine is the computer, and the output, which is experimental, is not restricted to the location, and does not damage the environment (Sanayei, 2004). According to another definition, Information Technology is said to a set of hardware, software, and theories, which collect, store, recover, process, and transmit the data in different forms (Moradi and Hashemi, 2005). Some others state that Information Technology is to collect, organize, store, and convey the information including sound, image, text, or numbers, that takes place via computer and communication tools (Khani, 2006). Advances in this technology promise various and efficient applications, some of which are apparent in the beginning of the new century (Zahedi, 2009).

Electronic communications: A 24-hour access to all service-providing centers, departments, commercial centers, other people, as well as having access to data in different levels and the possibility of doing activities via them, is called electronic communications.

RESULTS AND DISCUSSIONS

Descriptive analysis of the population

From among the 192 respondents, 167 individuals were male and 25 individuals were female (Table 1).

With regard to the fact that electronic payments are usually done by educated persons, it has been tried to use educated people to respond to the questionnaires. Hence, all the 192 respondents were educated, as shown in Table. 2.

Table 1. The percentage of respondents' gender

Gender	Number in population	Percentage
Female	25	13.1
Male	167	86.9

Table 2. Education level and percentage of the respondents

Level of education	Number in population	Percentage
Under diploma	89	4635
Third grade high school	48	25
Upper diploma	21	10.93
B.A/ B.S	17	8.85
M.A/ M.S	16	8.3
Phd	1	0.57

Data analysis

The status of ICT within the population: In this section, facilities and equipments such as television, telephone, mobile phone, dial up internet, high speed internet, and fax have been investigated. Results show that television has the highest percentage of abundance (99%) and fax has the lowest (15.9%). Results of this investigation are summarized in Table3.

Table 3. Number and percentage of ICT equipment within the population

Equipment	Number in population	Percentage	Equipment	Number in population	Percentage
Telephone	192	98.5	Television	192	99
ATM cards	137	65.4	Mobile	178	95.4
Computer	91	47.2	High-speed internet	123	61.3
Fax	23	15.9	Lap top	107	43.3

Electronic payments and intra-town trips: In order to determine the relationship between electronic payments and intra-town movements to do daily activities such as going to banks, Spearman Correlation was applied on SPSS. Results show that in reliability level of 90%, there is a significant negative relationship (-0.473) between the two variables of electronic payments and reduction of intra-town trips.

This means that an increase in electronic payments leads to reduction of intra-town trips and consequently, stability of urban beauty is increased (Table 4).

Table 4. Statistical analysis of the relationship between access to ICT equipment and reduction of intra-town trips

Correlations

Spearman	Reduction of intra-town trips	Correlation coefficient	0.0001	-0.473
		Significance level	0	.000
		Number	189	184

** significance test in 0.01 level

CONCLUSION

It can be said that in the past, communications were limited to roads and sailing. Thereafter, communication tools came to help to link people to each other. In the modern electronic world, there is a new possibility for the people to keep in touch with each other and do their daily activities without any physical movement. Achieving a regular and comprehensive framework of accurate information requires the users to be provided with necessary tools from the beginning of producing information to the process of transmitting it. Since having accurate and comprehensive information is a necessity to do daily activities, the required structures for development of ICT must be created or reinforced through an overall knowledge of the components of this technology.

Results of analyzing the status of ICT equipments in the population indicate that more than half of the population have access to this technology and use its services to do their daily activities such as banking tasks. The results of Kendal Correlation between the variables of electronic payments and the amount of intra-town trips within the research population show that there is a significant relationship between these variables, so that any increase in electronic payments leads to decrease in intra-town trips.

According to the findings of this study, and also with regard to other advantages of ICT such as reduction of traffic, reduction of air pollution, 24-hour access to services, and increasing managers' time for accurate planning and decision making, improving ICT requires scientific and expertise planning of urban managers in all departments.

Strategies for developing ICT in Yazd Township

✓Changing managers' attitude towards ICT and being aware of modern technologies

✓Improving infrastructures that are relevant to ICT in Yazd (e g. expanding bandwidth, establishing centers providing free internet, etc.)

✓Appropriate instruction of the managers and experts in respect with ICT

✓Appropriate distribution of electronic services in different parts of the town with regard to citizens' needs

✓Establishment of the necessary infrastructures in order to make step towards providing electronic services by different departments of the town

✓Encouraging the citizens to apply virtual methods of trading

✓Appropriate locating of communication offices (not to establish them in places with high load of traffic)

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