INTERNATIONAL JOURNAL OF eBUSINESS AND eGOVERNMENT STUDIES
Vol 3, No 2, 2011 ISSN: 2146-0744 (Online)

DIGITAL DIVIDE AMONG ENTERPRISES IN A DEVELOPING COUNTRY

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─Abstract ─

Over the past few decades, information and communication technologies (ICTs) have dramatically transformed the societies and the economies around the world. Today ICTs have become an essential part of the modern culture and cover almost all aspects of life. With advanced ICTs, especially the Internet, the world has become like a global village. As a result of advances in information technologies, the knowledge gaps have started to be apparent between people, organizations, and countries. Although developed countries enjoy the benefits of ICTs *in almost all areas of life, developing countries do not benefit enough from these technologies. There are significant differences between developed and developing countries in terms of accessing and using the ICTs. That is defined as the global digital divide. There are also different types of the digital divide within a country, such as the gender digital divide, the age digital divide and the income digital divide. The main aim of this paper is to explore the digital divide in enterprises in a developing country, Turkey, by using ICT Usage Survey in Enterprises, carried out by Turkish Statistical Institute (TurkStat).*

Key Words: *digital divide, enterprises, developing countries, Turkey*

JEL Classification: M10, M15

1. INTRODUCTION

With the rapid development and widespread use of ICTs, more and more people and organizations have started to rely on these technologies for daily life and business operations. ICTs have significantly affected almost all parts of the societies and the economies around the world in the past few decades. Today, ICTs such as computers, cell phones and the Internet have become an important part of modern culture and business operations. Today, the world has become closer than ever before, as one of the results of advances in ICTs. However, companies, households and individuals are using the opportunities offered by ICT at different speeds (Arendt, 2007). Although developed countries enjoy the benefits of ICTs in almost all areas of life, developing countries do not benefit enough from these technologies. As a result of advances in information technology, the knowledge gaps between the information-rich and the information-poor have deepened over time and that has caused excluding certain parts of the world from enjoying the fruits of global village (Iskandarani, 2008). Then the world has begun to notice the phenomenon, namely the digital divide. There is a significant digital divide exists between richer and poorer countries in the use of ICT and the availability of complementary assets such as telecommunications networks and skilled ICT professionals (Genus & Nor, 2007; Shih, Kraemer, & Dedrick, 2008). While the telecommunications infrastructure has grown and ICT has become less expensive and more accessible, today more than ever, the invisible line that separates rich from poor, men from women and the educated from the illiterate, also separates the connected from the disconnected (Zaidi, 2003). The unequal access to and utilization of ICTs has accepted as one of the prevalent issues of our times (Sciadas, 2005). Almost every indicator shows that there is a significant difference between developed and developing countries in terms of accessing and using ICTs. For example, according to International Telecommunication Union (ITU), while approximately 72 % of the population is Internet user in developed countries, this ratio is 21% in developing countries. The number of fixed telephone lines per 100 inhabitants in developing countries is estimated about 41, but, it is 12 in developing countries (ITU, 2010). It can be challenging to access up-to-date knowledge and information in developing countries (Suchak & Eisengrein, 2008). There is a

marked difference between developed and developing countries in terms of their take up and ability to use the ICTs (Genus & Nor, 2007).

ICTs have many benefits and advantages to small businesses. For example, Internet serves the small businesses in many ways. As a means of transaction, the Internet serves as a marketplace to bring sellers and buyers together for conducting sales; as a communication medium, the World Wide Web provides an inexpensive, easy and fast way for interacting with customers, suppliers and other businesses, and a company's Web presence helps enhance credibility, gather feedback, improve customer service, and facilitate business process (Chen et al., 2003). However, despite these apparent advantages and benefits, overall the literature suggests that Internet use is not prevalent among small enterprises (Karanasios, 2007), especially in developing countries. Research results have shown that SMEs do not take the advantages of ICTs and e-business solutions like large companies do, which make SMEs more vulnerable to globally changing economic conditions than large firms, since they have a relatively lower level of competitiveness (Arendt, 2007). Compared to large companies, small and medium-sized enterprises (SMEs) face various difficulties when adopting the Internet and e-commerce. These difficulties are mainly related with SMEs' structure and their surrounding environment (Al-Qirim, 2007). Small businesses usually lack the technical knowledge, the financial power, the know-how, and the experience (Al-Hawari, Al-Yamani, & Izwawa, 2008).

The main aim of this study is to explore the digital divide in enterprises in a developing country, Turkey.

2. LITERATURE REVIEW

The term "digital divide" was introduced by Larry Irving, Jr., former United States Assistant Secretary of Commerce for Telecommunication and Communication in the mid-1990s in order to focus public attention on the existing gap in access to information services between those who can afford to purchase the computer hardware and software necessary to participate in the global information network, and low income families and communities who cannot (Boje & Dragulanescu, 2003). The digital divide can be defined as "the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access ICTs and

to their use of the Internet for a wide variety of activities" (OECD, 2001: 5). The global digital divide refers to differences between countries in terms of access to ICTs. ICT access inequality is called as the first order digital divide and ICT use inequality is called as the second order digital divide (Jin & Cheong, 2008).

Norris (2001: 4) sees the digital divide as "any and every disparity within the online community" and accepts it as a multidimensional phenomenon. According to Norris, there are three dimensions of the digital divide, such as: global divide (the divergence of Internet access between industrialized and developed societies), social divide (the gap between information rich and poor in each nation), and democratic divide (the difference between those who do, and do not, use the panoply of digital resources to engage, mobilize and participate in public life).

Wilson (2004: 300) defines the digital divide as "an inequality in access, distribution, and use of information and communication technologies between two or more populations." According to Wilson, there are eight aspects of the digital divide: physical access, financial access, cognitive access, design access, content access, production access, institutional access, and political access. There are also philosophical and sociological sides of the digital divide because of a potential missed opportunity on the part of millions of people to obtain desirable jobs and enhance their lives by using computers and the Internet (Friedman, 2001).

According to Fuchs & Horak (2007), "the digital divide refers to unequal patterns of material access to, usage capabilities of, and benefits from computer-based information and communication technologies that are caused by certain stratification processes that produce classes of winners and losers of the information society, and participation in institutions governing ICTs and society." Fuchs & Horak (2007) defines the types of access to ICTs as follows; material access is the availability of hardware, software, applications, networks, and the usability of ICT devices and applications; usage and skill access is the capabilities needed for operating ICT hardware and applications for producing meaningful online content and for engaging in online communication and co-operation; benefit access means ICT usage that benefits the individual and advances a good society for all; institutional access is the participation of citizens in institutions that govern the Internet and ICTs, and the empowerment of citizens by ICTs to participate in political information, communication, and decision processes (Fuchs & Horak, 2007).

Today, there are many types of the digital divide at local, national, regional or world levels, such as the gender digital divide, the age digital divide, and the income digital divide; each such digital divide having its specific background, phenomena, evolution trends, perspectives as well as its specific bridging solutions and initiatives (Boje & Dragulanescu, 2003). Because of the continuous development of information technologies and the emergence of new technologies, the digital divide is a dynamic problem. The digital divide is a complex, and dynamic problem which has political, cultural, and ethical dimensions (Ahmed, 2007). The digital divide problem has also geographic, demographic and socio-economic dimensions (Yuguchi, 2008). In this paper the authors focus on business aspect of the digital divide in a developing country.

According to Chang, Wu and Cho (2011) there are four major aspects affecting the application of information technologies by SMEs as follows: organizational factors (support from senior directors, experience on the information system, user participation, financial resources, scope of the corporation, strength of information, experts in internal technical support, relative profits), environmental factors (support and efficiency of consultants, support of suppliers, competitive pressure, pressure from cooperative partners, customer support), innovative technological factors (compatibility of IT, complexity of IT, advantage of IT, costs of IT, number of management application systems), and corporate managerial factors (innovative spirit of managers, IT knowledge of managers). Chang, Wu and Cho (2011) classified the digital divide in SMEs as: "disadvantages in receiving digital resources" and "disadvantages in digital ability and literacy."

3. USE OF ICTs AMONG ENTERPRISES IN TURKEY

The authors explored the digital divide among enterprises in Turkey by using ICT Usage Survey in Enterprises carried out in 2005, 2007, 2008, 2009 and 2010 by TurkStat among enterprises with 10 or more employees.

According to the TurkStat survey results 92.3 percent of the surveyed enterprises use computer in 2010. Computer use rate among small businesses has been increased steadily from 86 percent to 92.3 percent since 2005. However there are

still some small enterprises with 10-49 employees do not use computer. Survey results show that computer use rates increase with enterprise size (Table 1).

Table 1: Rates of Internet and computer use and website ownership by the enterprise size in January 2010

	10 or more employees (%)	**10-49 employees (%)**	**50-249 employees (%)**	**250 or more employees (%)**
Computer use	92.3	91.3	97.0	98.5
Internet access	90.9	89.7	96.9	98.4
Website	52.5	48.0	73.9	87.3

Another sign of the digital divide in enterprises is the significant differences between businesses regarding Internet access rates. 90.9 percent of the surveyed enterprises have access to the Internet in January 2010. While 98.4 percent of enterprises with 250 or more employees use the Internet, 89.7 percent of enterprises with 10-49 employees have Internet access. Internet access rate has been increased in small businesses from 78 percent to 89.7 percent since 2005 (Table 1). According to TurkStat survey results, computer and Internet use rates are increased among small businesses from 2005 to 2010. However, there is a significant and consistent gap between small and large enterprises regarding computer and Internet use.

90.9 percent of enterprises use broadband connection to access to the Internet. According to the survey results DSL (ADSL, etc.) was the most widely-used broadband connection type among enterprises. Only 18.0 percent of enterprises still use an analogue modem or ISDN to access to the Internet.

Table 2: Proportion of enterprises which have the ICTs in January 2010

	10 or more employees (%)	**10-49 employees (%)**	**50-249 employees (%)**	**250 or more employees (%)**
Wire based LAN	73.2	69.7	90.1	95.9
Wireless LAN	47.1	43.6	63.9	73.3
Intranet	39.8	36.2	56.2	72.5
Extranet	12.4	10.1	21.3	38.1

It is quite clear that there is a great difference between enterprises in different sizes in terms of ICT use. While large companies can use different kinds of ICTs, small businesses do not enjoy the opportunities and advantages of information age

as large companies do. Table 2 and Table 3 show the use of ICTs and software packages/applications in enterprises by size.

Use rates of software packages/applications for ERP, CRM and SCM in large companies are much higher than small businesses. While use rates of software packages/applications for ERP, CRM and SCM in large companies are 49.8%, 59.4% and 29.4% respectively; these rates are 11.8%, 29.7%, and 14.6% in small businesses (Table 3). As Arendt (2007) indicated, the gap in the use of ICT between large companies and SMEs broadens, as the applications become more complex.

Table 3: Proportion of enterprises which have in use software packages/applications in January 2010

	10 or more employees (%)	**10-49 employees (%)**	**50-249 employees (%)**	**250 or more employees (%)**
Enterprise resource planning (ERP)	15.3	11.8	30.6	49.8
Customer relationship management (CRM)	32.7	29.7	46.1	59.4
Supply chain management (SCM)	16.0	14.6	22.2	29.4

66.1 percent of enterprises used the Internet for interaction with public authorities in 2009. According to the survey results main purposes of the interaction with public authorities via the Internet were to obtain forms and information. According to the TurkStat survey 78.1 percent of enterprises declared that they used the Internet for banking and financial services and 28.3 percent of them declared that they used it for training and education in January 2010. Internet use rates for these purposes increase as enterprise size increases (Table 4).

Table 4: Purpose of Internet use by enterprises in January 2010

	10 or more employees (%)	**10-49 employees (%)**	**50-249 employees (%)**	**250 or more employees (%)**
Banking and financial services	78.1	76.1	86.7	93.2
Training and education	28.3	26.5	35.1	48.4

52.5 percent of the surveyed enterprises have a website in 2010. While 87.3 percent of enterprises with 250 or more employees have a website, only 48 percent of small enterprises with 10-49 employees have a website. TurkStat

survey results reveal that website ownership rates increase with enterprise size. But these rates are not at the desired level especially in small businesses (Table 1).

E-commerce adoption rate among enterprises is still low in Turkey compared to developed countries. It was found that 8.4 percent of surveyed enterprises receive orders via computer networks and 15 percent of surveyed enterprises send orders via computer networks. Minority of surveyed small enterprises received and sent orders via computer networks in 2009 (Table 5).

Table 5: Proportion of enterprises that send and receive orders for products/services via computer networks during 2009

	Proportion of enterprises that receive orders for products/services via computer networks		**Proportion of enterprises that send orders for products/services via computer networks**	
Enterprise Size	**of all enterprises** (%)	**of enterprises which use computers** (%)	**of all enterprises** (%)	**of enterprises which use computers** (%)
10 or more employees	8.4	9.1	15.0	16.2
10-49 employees	7.6	8.3	13.9	15.2
50-249 employees	11.7	12.1	19.4	20.0
250 or more employees	18.6	18.9	26.9	27.3

3. CONCLUSION

In this study, the authors explored the digital divide among enterprises in Turkey by using the results of TurkStat ICT Usage Survey in Enterprises. According to the survey results, there is a significant difference between small and large enterprises in terms of use of computers and the Internet and website ownership. There is a significant digital divide exists in the use of ICTs among enterprises in Turkey. As enterprise size increases, the use of ICT also increases among enterprises. Even though the use of computer and Internet increased among small enterprises from 2005 to 2010, it was found that only 48 percent of small enterprises with 10-49 employees have a website in 2010.

Small businesses are accepted as the backbone of economic life in a country. In order to be alive in the global competition in today's economy; small businesses should keep up with the technological changes. However, it is challenging for small businesses with lack of financial and human resources to do so. Therefore,

small businesses need to be supported and encouraged in adopting information technologies. Government and chambers of commerce should support small businesses in overcoming existing barriers to adopt ICTs. These supports should focus on financial resources, material, usage and skill access.

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