E-Commerce: What makes the difference for developing countries?

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This paper represents the results of a survey with the present state, likelihood and modifications necessary to advice electronic commerce in Turkey – a developing country. To do so, comparisons are made with other developing nations – Egypt, Brazil, Malaysia and Ghana – and factors identified, which are judged to contribute most significantly to success and failure of electronic commerce in the developing world.

Introduction

With the rapid development of Internet and information technologies, the world is witnessing the various results and applications of the Information Society. Electronic commerce is one of these applications, which complements the New World order called Globalization. It has become the driving force for the innovation of every industry. The belief is that the increased levels of Information Technology (IT) usage and diffusion provide enhanced economic benefits and opportunities for economic growth (Nawawy & Ismail, 1999). Therefore, the advances in information and communication technologies are quickly transforming the industry through redefinition of products, services and markets. The underlying technologies of Internet provide a suitable environment for the creation of electronic markets, digital economies and new organizations within the enterprises. Similar changes also take place in state services, health and education. Firms that cannot properly adopt and adapt technologies that enable economic commerce or, in other words, the above changes could result in increasing exclusion from the international economy (Harrington, 1995).

Indeed, the developing countries are the ones most at risk, because they have constraints in access to technological, financial and human resources. On one hand, increased market access, opportunities to create new economical values, reduced administrative costs and improvement of public services are as important to developing countries as they are to developed ones. On the other hand, lack of a national IT policy, insufficient national communication infrastructure, shortage of skilled personnel, political, social and economical environments are the more obvious barriers to electronic commerce in developing countries. Therefore, the evolution of electronic commerce will follow a different path in the developing world from that seen in more technologically advanced nations. Not only that, the different socio-economical environments in different developing countries will result in different requirements for controlling the evolution of platforms for electronic commerce.

In the light of these beliefs, the authors initiated a study to analyze the requirements of electronic commerce in Turkey. In section two, we present the IT environment in Turkey. Section three presents the survey performed to identify whether Turkey does indeed have characteristics, which may necessitate a different approach to electronic commerce. The empirical results of this survey are discussed in section four. In section five we explore the situation in a sample of developing countries and investigate Turkey's position among them. Finally, the conclusion is given in section six.

Turkey

Electronic commerce can be defined as the exchange of information, goods, services and payments by electronic means (Harrington, 1995). The demand and available infrastructure of the Internet affect the development of electronic commerce in the country. In this section, the Internet infrastructure and utilization in Turkey is summarized empirically.

Turkey is located in a strategic geographical location – a bridge between two continents, Europe and Asia. Also, she has strong historical and cultural relations with the Balkan, Turkic Republics and Middle Eastern countries. Therefore, Turkey is always involved in negotiation, and mediation processes in economic and political events with these regions. In the last 20 years, Turkey has been moving

toward a more decentralized, deregulated and market-oriented economy. A strong privatization policy has swept the country. Many economic reforms are performed to attract more foreign investment and increase opportunities in general whilst trying pull down inflation.

Since 1984, significant investment is under taken to improve the telecommunication infrastructure of the country. This effort provided state-of-the-art digital equipment for Turkish Telecom that is the provider for all the telecommunication services in Turkey. From the perspective of a public individual in Turkey, the available methods of telecommunication (i.e. telephones and mobile phones) are given in table-2, (Turkish Telecom, 2000). On the other hand, services such as ISDN and cable TV are only available in the big cities like Istanbul, Ankara, and Izmir. Fiber optic lines are available through out the country, where an ATM network is recently set up. Moreover, to be able to support satellite communication applications, Turkish Telecom launched 3 satellites; TURKSAT 1B (11th August 1994), TURKSAT 1C (10th July 1996) and TURKSAT 2A (April 2000). In addition, GSM operations are licensed to two private companies, TURKCELL and TELSIM, in the first half of 1998 at one billion US dollars. However, Turkish Telecom is still a state monopoly, where privatization to 49% is expected soon. As for a regulatory body, there is nothing clear about the issue!

In terms of Internet connectivity, the current situation in Turkey is that there are two national backbones. One is for the academic and the other one is for the commercial networking. Indeed, Turkish Telecom is the communication carrier in both cases. Furthermore, the government finances the academic backbone, whereas reselling usage to the end users finances the commercial backbone. Each of these backbones has different network topologies and international links.

The commercial backbone, which is called as TTNET, is set up on a backbone of 13 nodes (Turkish Telecom, 2000). This backbone covers 8 big cities of the country and is a 155Mbps ATM backbone. All the other cities are connected to the backbone with either 34Mbps or 2Mbps lines, depending on their size. In total, there are 140 nodes on TTNET. In addition TTNET has three international links. Two of them are fiber optics; one is from Istanbul and the other is from Ankara; 45Mbps and 34Mbps respectively. Both of these lines are to USA. As for a backup line, there is a satellite link (TURKSAT) from Istanbul to Europe where this is also 34Mbps.

On the other hand, the academic backbone, ULAKNET, is established in the third quarter of 1996 and has been operated by a group, ULAKBIM, under the National Science and Technology Council, TUBITAK. Currently, there are 95 nodes using this ATM backbone, which is 38Mbps. ULAKNET has three international links. All three are from Ankara. Two of which are 4Mbps satellite links and the third one is a 2Mbps frame-relay connection. There is one gateway between the TTNET and ULAKNET backbones where this is 34Mbps.

Furthermore, many studies have been performed to provide data related to the utilization of the Internet in Turkey. However, it is difficult to make good estimates, because some of these studies present the data as the number of hosts, some present it as the number of sub-domains, and others still, provide the number of computers. Furthermore, few distinguish between household, and commercial users. Estimates of March 1995 show that the number of hosts in Turkey was almost 3,000 and the estimated number of users was around 10,000. However, by the end of May 2000, the number of hosts increased to 85,000 and the estimated number of users is 1,000,000 (ETKK, 2000). Hence, in a period of five years, the number of hosts is observed to have increased by 27 and the number of users has increased by 100 times. The number of people per computer, registered to Internet, is approximately 800 in May 2000. The same ratio was 1400 at the beginning of 1999. By the end of May 2000, the total number of organizations (educational, commercial, government etc.) that are registered in the *.tr* domain is over 20000 and 16000 of them are commercial. This shows that the growth under the *com.tr* sub-domain is actually the driving force behind the growth in Turkish Internet. In addition, it is estimated that there are around 70 Internet Service Providers in Turkey. However, since there is no clear interaction with the regulatory bodies, they need to work with Ministry of Transportation, Turkish Telecom and others separately. Therefore, to provide a single voice on such issues as defending their rights, improving business conditions, and to open up a communication channel to Turkish Telecom, a number of them set up an ISP association in 1997. Meanwhile, the Ministry of Transportation set up what is called "Internet Council". This council has 30 members from public and private organizations and they act as an advisory council for the ministry. In other words, the Internet Council tries to identify the problems and solutions about the infrastructure and also, aimed on the economic impact of Internet in Turkey.

Furthermore, in April 1998, the Prime Minister's office set up another council, called "Public Network Council". In this case, officers from 6 ministries form this council. These are: Transportation, Health, Education, Foreign Trade, State Planning Organization and Prime Minster's Office. Their goal is to coordinate the public network projects. Actually, these are around 30 different projects, unaware of each other and aiming for independent network backbones. All of these efforts showed that a master plan, of what had to be done in short, medium and long terms, in order to create a sound Information Technology infrastructure in Turkey, was needed. Therefore, the Ministry of Transportation awarded Turkish Information Master Plan (TUENA) to

TUBITAK and it was completed by the end of 1998 (TUENA, 2000).

In the scope of TUENA, a survey was launched to gather data on local characteristics of users. According to this survey, the distribution of communication technologies was not balanced within social groups, figures 1 and 2. For instance, approximately 77% of all computers were owned by the 40% of households that were within the upper and the highest socio-economic groups. The lower socio-economic status groups that make 40% of the households owned only 10% of all computers. In summary, the results of TUENA showed that the utilization of communication technologies in the urban population of our country was not widespread or balanced. However, one point, which is promising for the future, was that almost every stratum of the population had intense interest and high expectations about communication services (TUENA, 2000).

Figure-1 The percentage of telephone, computer and Internet ownership in Turkey (TUENA, 2000)
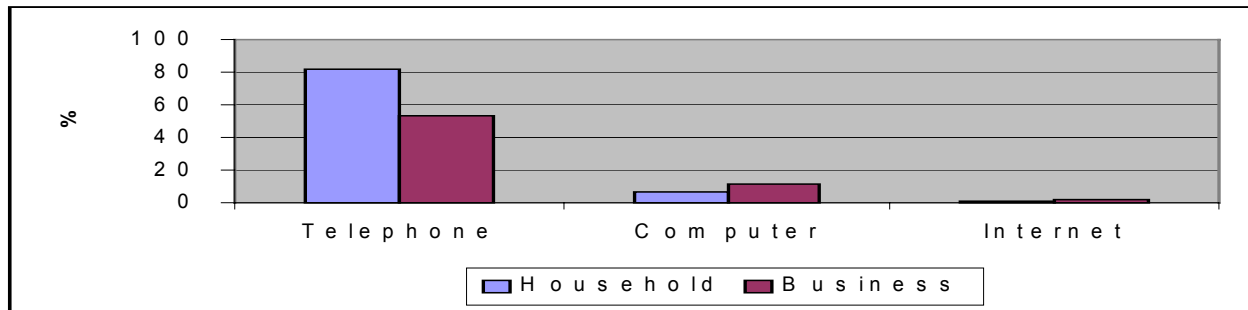
Figure-2 Distribution of computer and telephone according to the status (TUENA, 2000)
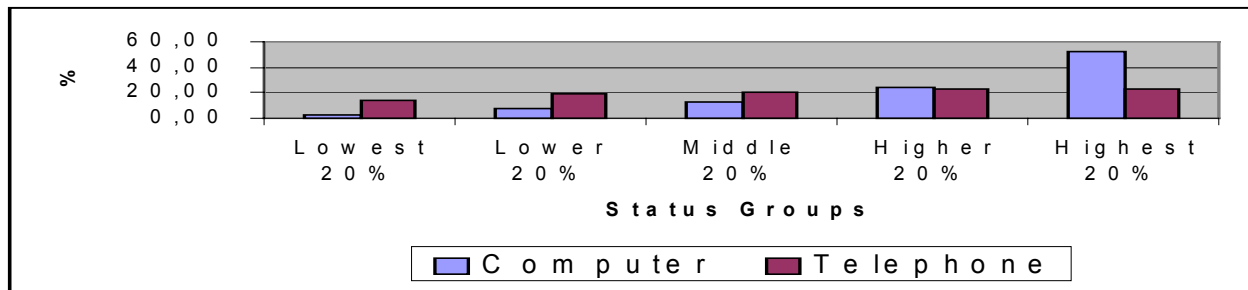
All these results show that there is a high demand from the population for using Internet services. The major problem here is that there is an access gap. One part of the society can access these new network services whilst another part cannot access this new social formation. The reasons behind this gap are the social and economical differences between the east and west parts of the country. The east part of the country is poorer than the west; therefore the infrastructure, the economic status of people and the degree of education are less, too. One of the solutions to this problem is to support the set up of new ISPs, by which access points will increase and in return competition will occur. Thus, prices will be more affordable. Another solution might be to increase the number of places such as Internet cafes, where people can share the access and resources at a reasonable cost.

The Survey

Our goal is to obtain accurate baseline estimates of Internet usage in Turkey by both large and small-to-medium size enterprises, irrespective of sector. Thus, a survey is performed in May 2000. We believe that the results of this survey would identify the most pressing needs for electronic commerce in Turkey. Then, we could develop from that point on according to the results. Thus, we distributed a comprehensive survey through postal service to different (some were big and some were SME) companies in 3 big cities of Turkey: Istanbul, Ankara, and Izmir. The language was in Turkish. Respondents were voluntary and people were assured that their individual responses would be treated as confidential. Twenty-four items of questionnaires (5 items for company data, 7 items for Internet usage and 12 items for e-commerce usage) were sent to respondents. A total of 76 completed questionnaires from 500 (Istanbul: 29, Ankara: 24, Izmir: 23) companies were returned to the researchers. The response rate was

15%. Although the sample is relatively small, it can be considered representative, particularly since it includes different kinds of companies from different cities of the country. Table-1 shows the profile of the respondents.

Table-1 Profile of Respondents

	MALE		FEMALE		MISSING
GENDER	60		13		3
AGE (average)	39		33		
	IT	ACCOUNTING	SALES		OTHERS
DEPARTMENT	24	10	6		33
	DIRECTOR		VICE-DIRECTOR		OTHERS
POSITION	40		3		30

Since the objective of this study was to identify the needs of the industry in terms of electronic commerce, the researches induce five factors as follows:

- *Company Identification Data:* There were four indicators for this factor. These included; name, sector, number of employees and percentage of sales.
- *Communication Infrastructure:* There were again four indicators for this factor. These were; network infrastructure, budget for it, the nature of Internet connection, and the ISP selection.
- *Internet Usage:* This was measured by usage of e-mail, availability of web site, usage of web service, and the number of orders they received from the net.
- *Education and Training:* The four indicators for this factor were; the definition of e-commerce, training for IT, training for e-commerce and publications on e-commerce
- *E-commerce activities:* The indicators, included for this factor, were; the services, the volume of transactions, problems, regulations, and Turkey's situation.

Moreover, there were eight items in the questionnaire that used two points, answers such as Yes/No. Single item questions were used to ascertain respondents gender, age, etc. and some company specific data. There were two open questions and the rest were three, five, six or eight point scale questions.

Data Analysis

The data was examined by using the sample of 76 responses. It was found that most of the responding companies were from the production sector whereas IT was the second common sector among the respondents, figure-3. In the following, short summaries of some findings, which appear to make information technology in Turkey different from developed countries, are given.

According to the results, 90% of the respondents have an e-mail address and 61% of the respondents use it more than once per day. On the other hand, 76% of the companies have a web site, but only 36% of them have received an order from the net. One of the questions that were asked to the respondents was the reason they had an Internet connection. They were given choices as communication, advertisements, marketing, data transfer, and others. Also, they were told they could choose more than one if they wanted. It is found that 36% of them responded as marketing, whereas 52% selected the "others" option. When they were asked how they found information about their ISP, 43% replied as according to the research they made and 25% told according to the advice they had received. Another interesting question was the criteria they considered before selecting their ISP, figure-4. Again, the respondents were allowed to choose more than one option. Thus, 44% of them said the most important property is the quality of service of the ISP and the second criteria to include is the speed of the connection (42%).

Figure-3 Sectors of the companies
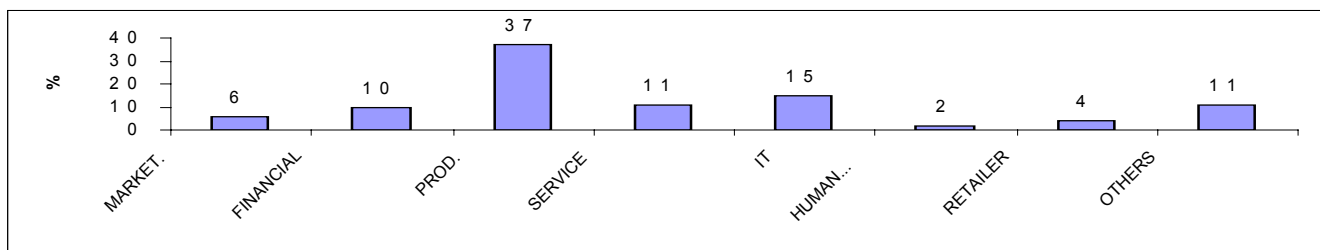
Furthermore, 42% of the respondents believe that e-commerce was something very important for their company, but only 8% of them had more than 20% of their budget allocated to electronic commerce related items, such as training or infrastructure investments. However, most of them (83%) try to follow electronic commerce related issues to keep up with the technology.

Another interesting result of the survey is that according to the respondents, a regulatory body that will be established should not be under the control of the state, 77%-private sector, and 23%-state. This is actually very interesting because respondents from the companies do not want to leave the control outside of industry!

Figure-4 Criteria for the selection of an ISP
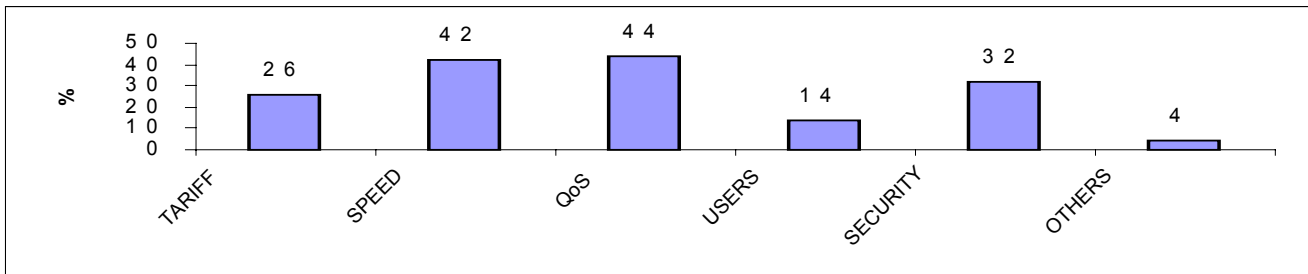
On the other hand, only 3% of the respondents believe that the quality of their web sites is good (56% said not good, and 41% said they were not sure). This is actually really interesting because respondents want to leave the regulatory issues to private sector but the same private sector is not good enough in developing their web sites. In other words, 97% of the respondents believe that the electronic commerce web sites do not meet their requirements. This may be because of incorrect requirements analysis that the company performed about the electronic commerce concept or misunderstandings in the development phase of the web sites. Anyhow, it should be noticed that requirements analysis, performed by the wrong group of people, might lead to inefficient use of electronic commerce web sites. In summary, the respondents believe that electronic commerce is important for their future. Thus, most companies have web pages because they see it as an initial step towards electronic commerce. However, they believe that the quality of their sites is not good enough. Moreover, most of them do not get any transactions or orders via Internet, which lets them believe that the market demand is low. On the other hand, they do not invest in training and education of their personnel in electronic commerce to increase the quality and usage. Respondents told that the problems that they were facing in electronic commerce were mostly because of the inadequate infrastructure, security issues, and lack of education. They think that a regulatory body might be able to solve some of these problems and they want it to be under their control. On the other hand, the state is involved in forming master plans for the infrastructure of the country, in establishing Electronic Trade Coordination Council (ETKK, 2000), and in forming a new ministry for information society. However, the initiatives taken to make

the legal system suitable for electronic commerce are giving their fruits very slowly. For example, BILTEN (BILTEN, 2000), which is a working group under Turkish National Science and Technology council, has already developed a digital certificate according to the international standards. They also work on becoming a Certificate Authority. Still, no changes have been made to the legal system to approve/accept digital signatures as a replacement of hand-written ones. Since digital signatures are not accepted by the system, no electronic document is accepted as definite evidence at the courts. It totally depends on the judge's interpretation when such a case occurs. Although electronic files are not accepted as definite evidence, if they are updated, deleted or used against any person or organization in order to create damage or make them suffer, then it is accepted as a crime and a penalty can be given. Regarding the legal aspects of consumer privacy issues, no modification has been made to prevent the "big brother" attitude on computer networks and electronic environments. Meanwhile, work is still under process to make the Turkish rules on privacy issues to support the rules of the European Union (EU), since Turkey has signed the agreement with EU in 1981. As above, if any problem occurs regarding these issues between a Turkish company and, say, a European company, it is not clear how it will be resolved! In the next section, Turkey, a bridge between the different regions, will be examined in terms of how much she had made use of her geopolitical condition taken into consideration the aforementioned factors.

Developing Countries

The preceding text introduced survey results, investigating the social, technological, economical and

political requirements of electronic commerce in Turkey. In this section these results will be compared with four other developing countries. The authors believe that this can shed light on recognizing different stages of electronic commerce among developing countries, which in return can help to speed up the identification of areas for cooperation among these nations.

However, the term developing country is applicable to nearly three quarters of the world population, and a quarter of world's GDP (McConnell, 2000). Thus, in order to identify a representative cross-section of countries for comparison two properties are used to classify their characteristics. Firstly, the economic indicators set by *The World Bank Group* (World Bank, 2000), and secondly, their geographical and cultural backgrounds. Moreover, such a classification qualifies the stage of economic evolution reached, where this is also related to the level of electronic commerce, the country is capable of supporting.

The four developing countries, against which Turkey is compared, are: Brazil, Egypt, Ghana, and Malaysia. These countries represent the different regions of the world where most developing countries are said to lie (McConnell, 2000). Brazil (Forbes 2000; Davis, 1999) is used to represent the South America, Egypt (Nawawy, 1999) the Middle East, Ghana from Africa (APC, 2000; Mursu, 2000), and Malaysia (OCSB, 2000; Leong, 2000) from Asia. Turkey is considered to be part of Europe in some surveys and part of Middle East in others. We believe it is a bridge between Asia, Middle East and Europe, and probably closer to Middle East in terms of geography and culture.

Brazil representing South America, presents favorable opportunities in terms of electronic commerce. The percentage of the Internet users is the highest among the five countries (see table-2 and figure-5) and the structure of economic output shows that it is one of the leading economies in the developing world (see table-3). She is also actively pursuing policies to promote the electronic society at the nation's level. An example of this is: the online services of the Brazilian government enabled ten million of the nation's citizens to file their income taxes electronically last year (McConnell, 2000).

Malaysia is another good example of a country, which has given a high priority to achieving an electronic society by the government. Specifically, the Malaysian government investment in state-of-the-art, technology hub, multi-million dollar *Information Superhighway* has increased the percentage of Internet users and high technology exports significantly (see table-2 and figure-5). This marks a significant investment by an Asian developing country – Indonesia, India, Pakistan all having poor telecommunication infrastructures effectively acting as a catalyst for many business start-ups. We, therefore, consider that both Malaysia and Brazil are at one end of the developing country spectrum, where they represent a group whose electronic readiness is better than the others.

However, at the other end of the spectrum lie countries, where the provision of basic life necessities is still the highest priority issue and economic indicators are much worse. Africa and the Middle East region and some of Asia are actually in this category. Ghana is one of the better examples of this group in Africa. Despite the difficult conditions in terms of economic conditions, telecommunication infrastructure, and trained people (see tables 2 and 3), Ghana provides an interesting example on how infrastructure issues are being addressed. Through a 1994 private sector initiative, Ghana was the first West African nation to attain connectivity to Internet. If recently announced government initiatives in Ghana materialize, such as connecting 42 sites across the nation, utilizing wide area networks for the connection of key government ministries, then the country's telecommunication infrastructure may soon bloom (McConnell, 2000).

Egypt is another example where similar issues are being addressed. Egypt's case is significant because she also represents an example of the Arabic world where cultural issues play an important role. In the Middle East, Egypt is one of the countries, which has taken a liberal stance, although it was not until 1998 that it became legal for citizens to own a second telephone line (McConnell, 2000). However, Egypt is still leading in this region in terms of the priority given to the electronic society by the government. For example, pilot information networks have been launched covering culture, tourism, healthcare, environment, education, public services and local government administrations.

Table-2 Communications, information, and science and technology (World Bank, 2000)

Economy	Per 1000 People				Internet hosts/10000 people	Scientists & Engineers/ million people	High-technology exports %
	TVs	Phone mainlines	Mobile phones	Personal computers			
Brazil	316	121	47	30.1	26.22	168	9
Egypt	122	60	1	9.1	0.73	459	0
Ghana	99	8	1	1.6	0.06	..	..
Malaysia	166	198	99	58.6	25.43	93	54
Turkey	286	254	53	23.2	13.92	291	2

Figure-5 Ratio of Internet users among the population
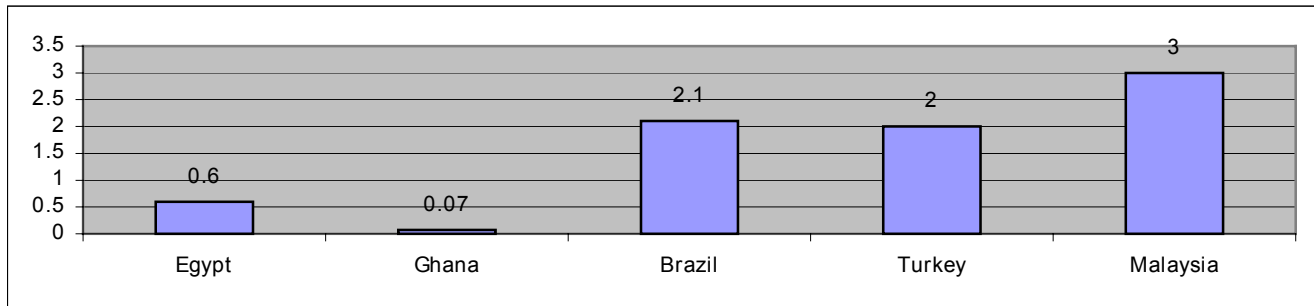
Table-3 Economy - Structure of Output (World Bank, 2000)

Economy	Value added as % of GDP							
	Agriculture		Industry		Manufacturing		Service	
	1990	1999	1990	1999	1990	1999	1990	1999
Brazil	8	9	39	29	25	23	53	62
Egypt	19	17	29	33	24	27	52	50
Ghana	45	36	17	25	10	9	38	39
Malaysia	19	14	40	44	26	35	41	43
Turkey	18	18	30	26	20	16	52	56

The authors of this paper believe that the readiness for electronic commerce is closely related to the level of economy, telecommunication infrastructure, trained people, Internet usage and the priority given by the government. In the above sample countries, these are the factors that make them the leading examples of their region.

Conclusion

Several factors determine the diversity of electronic commerce in a country. These include the quality and reliability of the infrastructure, the cost of access, the availability of technical skills, and the policy and regulatory environment. Indeed, the barriers to entry to electronic commerce are as much organizational and managerial, as cultural and technological. In the developed countries, electronic commerce means a wide range of information technology enabled business transformations (Mursu, 2000). On the other hand, in some of the developing countries like Turkey, the term "electronic commerce" means primarily web-based consumer oriented retail commerce. As a consequence, the electronic society does not have a high priority in such countries. However, in other developing countries such as Malaysia and Brazil, electronic commerce is interpreted as the globalization in economy and business. Hence, the improvement experienced in these countries is not only a *pull* from the technology (i.e. Turkish case), but also a *push* by the government and people to improve their competitive edge. Although, Turkey has performed better than many Asian, South American, Middle East, and African countries in the developing world, she is still behind such countries as Brazil (Forbes, 2000; World Bank, 2000), and Malaysia (OCSB, 2000; Leong, 2000) in terms of legal issues. The authors believe that in order to become an information society and go through the new transformation of business, a national IT policy is needed.

In order to form such a policy, the difficulties related to the business rules, legal aspects, telecommunication infrastructure, and educated/trained personnel should be considered. We believe that *education* is one of the key issues. A country without appropriate personnel will not be able to form or follow any policy. However, it is important to have the right amount of educated people to match the needs of the country. As it is shown in table-2, what currently happens in Egypt or in Turkey is that the number of scientists and engineers in the society is high compared to the other models of the developing countries. However, this is not reflected to the outcome, table-3. The authors believe that the reason behind this is that the way the people are educated is not according to the needs of the country. For example, in Turkey, still hundreds of civil engineers are trained whereas there are not enough jobs in this sector to use them. A worst case than this is the trained people are not provided with the right environments to work or not pulled to the right jobs. In effect, from the perspective of the society, this results in loosing the investment made to educate/train them. From the perspective of the industry, it results in facing difficulties in interpreting the new meaning of electronic commerce and not being able to compete.

There are different ways to attack this problem. Hence, to attract international investment to Turkey mainly in information technologies, whilst developing methodologies to protect "Made in Turkey" small-to-medium size information technology companies, is one these ways.

Another really important issue is the diffusion of information technology in the country. This is significant and difficult in developing countries. As indicated in studies (Davis, 1999; Mursu, 2000; Nawawy, 1999) performed in South America, Africa and Egypt, it is much more important to solve the economic and political problems, which cause insecurity of life and uncertainty for the future in the eyes of the people on the street. Therefore, it is difficult to provide the sustainability and affordability of information technologies and electronic commerce for the majority of the society over the near future. However, it is possible to use information technology services as an indirect service in healthcare or education because it has a high multiplier effect when delivering more efficient, accessible, and focused services. Ultimately, this will lead to community involvement in information services, which will result in creating a *push* by the society rather than only a *pull* from the technology.

In this work, we presented the results of a survey among Turkish companies to understand the requirements of electronic commerce in Turkey. We compared this data against research performed in other developing countries. We believe that what really makes the difference for developing countries is how much the society as a whole is involved in this process and how the regulations are set up to support the overall transformation from an industrial based society to an information based society. Indeed, it is difficult to jump steps for a society as a whole when they go through this evolutionary process. In other words, it is difficult to become an information society before completing the needs for an industrialized society. However, it is possible to ease and speed-up the evolution by creating a *push* from the society and the state to implement this transformation. Only having a technological *pull* conducted by some of the industries or part of the state in a country (i.e. Turkey, Egypt etc.) will not be enough to achieve the objectives (World Bank, 2000). Therefore, the thing that really makes the difference is the involvement of society into the electronic commerce. The authors believe that Brazil and Malaysia are good examples of setting up the electronic society, which is the first step of electronic commerce. Indeed, the improvement of law and policy-making, the telecommunication infrastructure, and educating/ training people are the significant issues to become an electronic society. However, by sharing the experience among the developing countries in the evolutionary stages of electronic commerce and attracting foreign investments will speed-up the process! Hence, it will be easier for the society as a whole to pass through this transformation.

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