

ICT ADOPTION – A NECESSITY FOR ROMANIAN SMES

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In today's global economy the use of ICTs technologies is key for achieving growth and competitiveness. Business can use ICT in their relationship with suppliers or customers, to process accounts, to manage the internal processes or to file taxes. Our paper is concerned with studying the use of ICT in Romanian companies in general and especially in Transylvanian SMEs. We conducted a survey among the Transylvanian SMEs with regard to their level of endowment with computers, the number of staff working full-time in IT, the activities that imply computers, the ability to process information, to plan and solve problems using computers.

Keywords: ICT, SMEs, Romania, Transylvania

JEL Classification: M15

1. Introduction

Information and communication technologies (ICT) are changing the whole perception of development, pushing forward the frontiers of communications, medicine, agriculture, energy and sources of growth which altogether are enhancing productivity and competitiveness of nations and helping them achieve higher living standards for their people. The use of ICT and technology has affected every aspect of business, transforming not only the way that business is conducted but also creating new business sectors and jobs.

There is a large consensus among scholars and policymakers that the adequate use of information and communication technology increases the competitiveness of employees and strengthens the position of companies in the global economy [8]. Due to advances in computer technology, the declining cost of systems and improved software and technological sophistication of the workforce, no longer are adaptations reserved for the technologically elite, which results in opportunities for innovation in the small firm. Also, the more flexible managerial capabilities of SMEs dictate the extent of success of IT adoption and the resulting positive effects on financial performance [5]. For this reason, smaller firms should be able to more effectively utilize IT to exploit newer technologies than their larger, less agile competitors [13].

2. ICT adoption in EU and Romanian businesses

The number of EU enterprises (with 10 or more full-time employees) that accessed the Internet using a broadband connection registered a significant growth of 37% up to 83% from 2004 to 2009. In Romania the percentage of enterprises using broadband connection to Internet was at 50% of the EU average with a 41 % in 2009. 73% of Romanian enterprises had access to the Internet in 2009 when compared to European Union countries where the percentage was 94%. The highest percentage growth of firms that had access to the Internet between 2004 and 2009 was recorded in the range of small businesses from 45% to 69%. However this percentage is below the EU average by 25%.

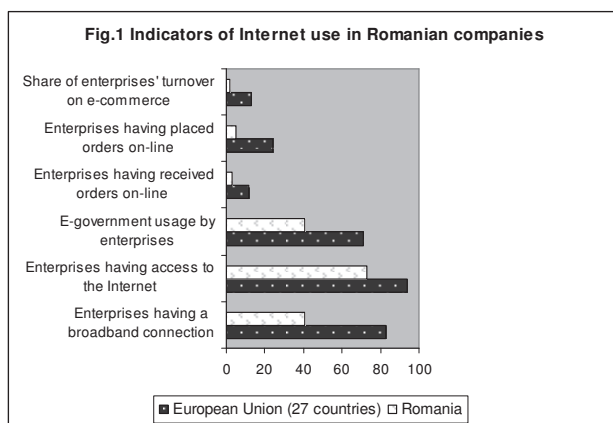
Around three quarters (71%) of EU enterprises used e-government services: the majority to obtain information and to download forms (65 % and 64 % respectively), while 55 % of

enterprises returned filled-in forms using e-government services. In 2009, in Romania, 41 % of the enterprises used e-government services mainly to obtain information (40%).

Between 2007 and 2009, in the EU, the percentage of enterprises that received orders online, decreased from 15% to 12%. In Romania this indicator maintained it's value at 3% well below the European average during this three year period. The proportion of enterprises that used the Internet to place orders to purchase goods or services decreased registered a 5% decreased to 24% between 2007 and 2009. Across the Member States, the general pattern shows a considerably higher proportion of enterprises have made purchases online, when compared to those that have received orders online (probably reflecting the greater complexity of setting up an online selling system as compared with making purchases). Romania is an exception from this pattern, the proportion of companies that have purchase goods via Internet being only with 2% higher than the percentage of enterprises that have received order online.

In 2009, in the EU, the proportion of total turnover accounted for by e-commerce via the Internet equated to 13 %. The percentage of enterprises' total turnover from E-commerce via Internet, in Romania was only 2.

The total value of the ICT market in Europe was EUR 785.7 billion in 2007, representing 6% of total GDP. The IT market (hardware, software and services) amounted to EUR 355.3 billion, while the telecommunications market represented a total value of EUR 435.6 billion.



According to a study made yearly by the Swiss organization, World Economic Forum, which evaluates how well prepared a country is to participate in the network economy by benefiting from the ICT advantages, Romania ranks for 2009-2010 at 59th position in the world, among a total of 133 countries. The Network Readiness Index is formed by points awarded for market environment, telecommunication infrastructure, law and regulations, availability and usage of Information technologies by individual

users, companies and government and public institutions.

The main motives for this low level of Romanian's Index are effectiveness and efficiency of legal framework, availability of latest technologies, companies spending on R&D and insufficiently developed infrastructure.

If we take into account that 99% from the total firms are SMEs results from this report that they are not competitive mainly due to IT infrastructure. It is obvious that Romanian SMEs are ignoring the advantages offer by new technologies or do not investing in this direction. Also the impact of the new technologies on sales still represents an insignificant percentage [23].

Some Romanian researchers identified that the most SMEs apply to small extent IT infrastructure to run business, being also a problem of mentality at managerial level and behavior culture at human resources [7]. The most purchased computer software products and applications by SMEs are those for accounting, financial and remuneration activities, those related to sales, purchasing, etc. are less implemented. Even in situations when SMEs buy IT systems for the entire departments or activities, share applications of integrated Enterprise resource Planning (ERP) is very low.

3. Research method and results

3.1. Research method

Our paper is concerned with studying the use of ICT in Romanian companies in general and especially Transylvanian SMEs. In order to describe the use of ICT by Romanian companies when compared to the countries of European Union we used secondary data from Eurostat.

For a better understanding of the Transylvania SME's attitude regarding the use of ICT we developed a quantitative study and utilized a survey research design. A structured questionnaire was developed to obtain information about SMEs ICT usage between November-December 2008. Data were collected by way of a self-administered questionnaire with the study sample compromising a number of 350 SMEs from Transylvania Region, which has been chosen using the lists of the Chamber of Commerce and Industry. The firms chosen varied by size, field of activity and number of employees. A total number of 257 completed and usable questionnaires were obtained, indicating 73.43% rate of response.

3.2. Sample characteristics

The descriptive analysis of the demographic characteristics of the SMEs is presented in Tabel 1. By size almost 14% from the firms are micro enterprises and an equal number come in the other two categories small and medium enterprises with 43 ponder.

A percent of 49.8 of the SME's are production enterprises, 25.68 % are service companies and 24.52 % are commerce enterprises.

Table 1 The structure of enterprises based on activity and number of employees

Number of employees	Main field of activity		
	<i>Production</i>	<i>Services</i>	<i>Commerce</i>
1-9	1.6%	30.3%	20.6%
10-49	39.1%	31.8%	63.5%
50-250	59.4%	37.9%	15.9%

The vast majority of the investigated SME's were founded in 1992-1996 regardless they were micro, small or medium enterprises.

3.3. Results

We start analyze with investigation about usage behavior of ICT in different aspects of their routine business activity. The results of the study show that SMEs did not developed internal technological systems for communication, 60% of the enterprises do not have Intranet network, due to their small number of employees which give the opportunity of face-to-face communication. The ICT infrastructure is well developed if we take into account the average number of work places equipped with computers of 7.33

An average of 34 % of the internal and external correspondence is conducted via E-mail.

Table 2 Mode of conducting the correspondence

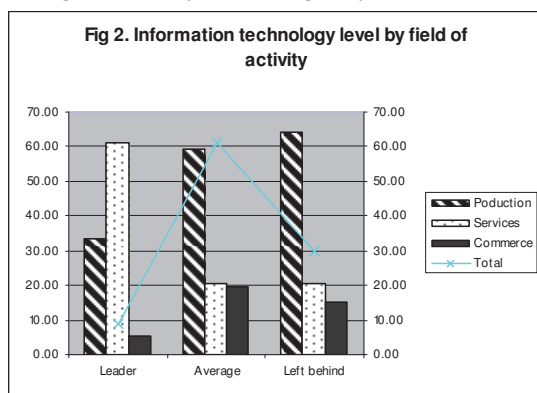
	Minim	Maxim	Mean	Std. Dev.
Percentage of internal and external correspondence is done traditionally	0	100	70.723	28.97
Percentage of internal and external correspondence is done by E-mail	0	100	34.192	29.60

Investigated companies use most information technology in domains such as: accounting and financing (32%), administration (16%) and sales (14%). The less application of IT is surprisingly in R&D. This may be an explanation for the low development of this kind of activities for the SMEs. Also the number of R&D employees working full-time in IT is very small (Mean=0.81). One-way ANOVA was conducted to examine whether average number of employees in IT field differ significantly by main field of SMEs activity.

The ANOVA Test showed that there was no significant difference between the average number of employees in the IT field based on business ($F=1.033$, $p=0.357 > 0.05$).

Knowing that ICT field has a rapid rate of development and obsolete we questioned the companies whether they can keep up with the most advanced technical/technological trends regarding the application of information technology. More than 60% of the SMEs declared they use an average level technology and only 9% use advanced IT technologies. While services SMEs are the ones that use advanced IT technologies the less advanced technologies are used in production sector.

The results show a statistically significant link (Chi Square = 47.648, $df=6$, $p=0.000 < 0.1$) about average intensity (Contingency Coefficient = 0.395, $p=0.000 < 0.01$) between the main filed of



activity and the level of IT technologies adopted by the enterprises. That means SMEs from service field are more orientated toward ICT novelty comparing with those activated in production. We also investigate the correlation between firm size and development level of IT technology used. Small enterprises are the ones that use more leader technologies while the micro companies use a low level IT technology (Chi Square = 12.405, $p=0.015 < 0.05$) but was not identified a correlation (either positive or negative) between the two variables (Spearman $\rho = -0.108$, $p=0.131 > 0.05$).

Table 3. Information technology level by company's dimension

	Leader (%)	Medium (%)	Left Behind (%)
Number of employees			
1-9	4.17	41.67	54.17
10-49	13.79	57.47	28.74
50-249	5.75	70.11	24.14

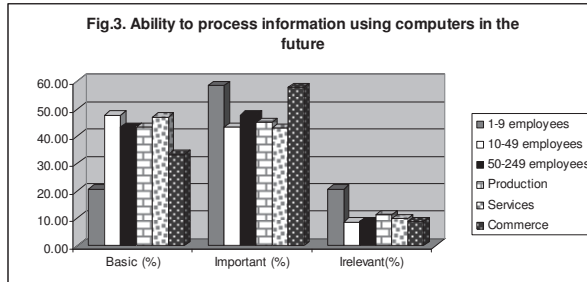
Regardless the SMEs capacity to meet the modern and actual need to process information with the help of computers resulted for more that 58% at satisfactory level. This result gives us the idea of an IT infrastructure that enables employees to be more productive and accomplish easier their work tasks due to computer using technology in data gathering and analyzing. We tested the correlations between level of this capacity of SMEs and field of their activity and size. It was not finding any significant links between, but results a higher ponders of unsatisfactory level for micro enterprises.

Another important advantage for SMEs related to computer using is the ability to plan and solve strategic aspects in their business activity coordination. Regarding to this ability the ponder of satisfactory level it is of 51%, that means only half of the firms consider that their IT technology infrastructure is appropriate for planning their business activities.

Table 4 Ability to plan and solve problems using the computer

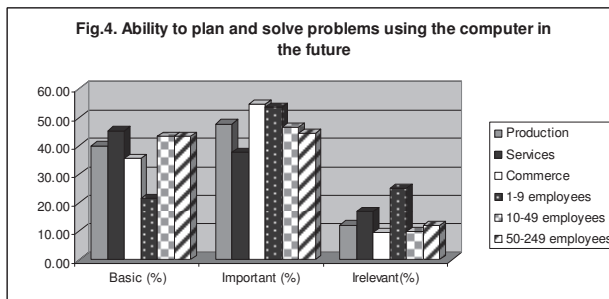
Number of employees	Satisfactory (%)	Partial (%)	Unsatisfactory (%)
1-9	37.50	25.00	37.50
10-49	52.27	32.95	14.77
50-249	54.65	33.72	11.63

However it was identified a link between company's ability to plan and solve problems using the computer and it's size (Chi Square=9.511, $p=0.049<0.05$) without being able to establish a correlation between the two variables.



Both micro enterprises and medium firms consider the ability to analyze information using computer important from the perspective of the future. Small firms consider this skill as a basic one. Most companies that consider these skills important for the future of the company are those in trade, while this ability is considered a basic one by most services

firms. Most companies that consider it irrelevant are acting in the field of production.



The ability to plan and solve problems using computer is considered a basic one by the companies in the field of services and by the small and medium enterprises and an important one by commerce firms and by the most of micro-enterprises. The most companies that indicated this ability to be irrelevant are services companies and micro firms.

The analysis of collected data revealed the

existence of a very strong direct correlation between the ability to use computers in planning and solving problems level of modernity and the importance given to these skills in the company's future prospects (Spearman Correlation =0.543 >0.5 , approx sig = 0.0 <0.05). Also a direct correlation of the average intensity has been identified between the ability to process information with the help of computers level of modernity and the importance given to this skill in the future company's perspectives (Spearman Correlation =0.493, approx sig = 0.0 <0.05). This implies unfortunately that the companies that consider these abilities level of modernity unsatisfactory also consider them to be irrelevant in the future.

4 Conclusion

ICT adoption is likely to stimulate the extensive and intensive development of both production and services companies. Regarding the extensive development, ICT offers an opportunity for Romanian companies to access new markets, regionally and globally, and to promote and sell products and domestic services electronically. Intensive development consists in lower production, administration and sales costs, due to the use of ICT, which can result in a significant increase of productivity of the factors used. The use of ICT affects firm performance primarily when accompanied by other changes and investments and without these, the economic impact of ICT

may be limited, so complementary investments in skills, organisational change and innovation are key to making ICT work,

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