Information technology use in Romanian companies- case of Transylvanian SMEs

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Abstract: - ICT’s contribution to economic growth is mainly achieved by its use in the firms. Use of ICT is likely to stimulate the extensive and intensive development of the production and services sector. Regarding the extensive development, ICT provides the opportunity for Romanian companies to access new regional or global markets, or to promote and sell products and services electronically. Intensive development is due to decreased production management and disposal costs, due to the use of ICT, which can result in a significant increase in productivity of the factors used.

Key-Words: - ICT, SMEs, Romania, Transylvania

1 Introduction
The SMEs play an important role in every country’s economy, generating an important share of GDP and also providing an important number of jobs. Due to the important role of this sector for overall development there are many support programs developed by governments that range from tax incentives to technical assistance, from regulatory provisions to policy interventions, training and other types of business development services [13]. Nowadays, due to intensified and global competition SMEs need all the support they can get to enhance their competitiveness in order to develop and even to stay in business.

There is a large consensus among scholars and policymakers that the adequate use of information and communication technology (ICT) increases the competitiveness of employees and strengthens the position of companies in the global economy [12].

Today, new technologies offer to manufacturing and service SMEs the opportunity to develop and enhance their business. For being competitive it is necessary to change and adapt to new developments and innovations from many points of view not just manufacturing. That’s why management of the new technologies becomes essential.

Many researchers argue that those companies that invest heavily in IT outperform competitors that do not invest to the same extent, realizing greater returns from the marketplace [2],[17],[20]. Consequently, firms often invest substantial resources in IT assets (computer hardware, computer software, and personnel) [11]. IT enables firms to respond more appropriately to their environment [5], and to receive and process information more efficiently [8],[15], thereby facilitating competitive advantage [1],[16],[19]. Firms are able to create unique resources and capabilities through the use of IT that are not easily inimitable, which is consistent with the resource-based view growth [6]. The use of IT is also considered as a competitive tool used for the implementation of strategic plans and the support of firm core competencies [6],[14], linking strategy to IT allows firms to compete more effectively [4]. IT can be used to influence a firm’s ability to gain a competitive advantage [10],[18], through the linkage of IT with a firm’s strategy and industry. New challenges of the global market have forced SMEs to employ new methods of production, to improve product quality and reliability of products, delivery systems, reduce costs and above all to gain more flexibility.

A study by Powell and Dent-Micaleff (1997) confirmed a direct link between IT and firm performance. Ravichandran and Lertwongsatien (2005) also found a direct relationship between investments in IT capabilities and firm financial performance; Dibrell, Davis and Craig (2008) argue that IT does have a positive and significant effect on current profitability and future growth.

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 [3]. Also, the more flexible managerial capabilities of SMEs dictate the extent of success of IT adoption and the resulting
positive effects on financial performance [9]. For this reason, smaller firms should be able to more effectively utilize IT to exploit newer technologies than their larger, less agile competitors [21].

All these evidence form the literature determined us to investigate the level of IT usage in SMEs form Romania. 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 use computers for, the ability to process information, to plan and solve problems using computers. We were also interested in the support programs for SMEs provided by Romanian government and also by U.E. institutions.

2 ICT usage in Romanian companies

IT in Romania has deep roots in the past. Before 1989 Romania was the first country from Easter Europe who develop computers and minicomputers (CIFA-1957, DACICC- 1962) Lack of investments conduct to an obsolete technologies and a high potential market after 1990. All world major ICT companies have arrived in Romania attracted by market conditions and well prepared human resources.

Today there are more than 8000 software and IT services companies in Romania. Many multinationals companies from USA and West Europe started to create in our country large R&D, production or service facilities. Regarding the spread of ITC, Romania is behind other countries in Central and Eastern Europe. There is, however, a rapidly growing presence of mobile phones, use of the Internet (including broadband), use of computers connected to the Internet by firms and of investments and expenditure on equipment.

Related to IT market it is obvious the quickly increase from 2000 until 2006. If computer hardware segment tended to became saturated in the last 2 years, the computer software and IT services continued their growing with high rate of 22-32%. Investments and expenditure for products and services of information technology registered during 2006, a significant increase. Also, investment and expenditure on goods and services of communication have increased in 2006 compared with 2005 by 15%.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2003</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (billion USD)</td>
<td>57.2</td>
<td>90.8</td>
</tr>
<tr>
<td>ICT Spending (billion USD)</td>
<td>1,333</td>
<td>2,412</td>
</tr>
<tr>
<td>IT Spending/GDP(%)</td>
<td>0.8</td>
<td>0.5</td>
</tr>
<tr>
<td>PC Penetration (%)</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Mobile Phone Penetration (%)</td>
<td>25</td>
<td>60</td>
</tr>
</tbody>
</table>

Sources: MCTI, ING, INS, Eurostat

Romanian firms in the ICT sector grew by 10% (almost all of them are SMEs), 19% in number of employees and 34% profit in 2005 as well as in 2006. According to the European Monitoring Center for Information Technology (EITO), Romania is proving to be the most dynamic technology market in Europe. Romania being one of the first countries which fully liberalize communications market registered also a high development of this market.

![Fig.1 Evolution of Romanian market communications 2000-2009](image)

Due to this evolution the internet penetration was explosive. There are 980 Internet Service providers and for 2005 reported a number of 1,8 million accesses. Broadband access is in a growing stage comparing with dial-up, accounted in 2005 41% of the total. The number of employees using the Internet in companies has doubled in construction and industry and experienced a significant increase in trade (from 19% to 28%) from 2005 to 2006.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of equipment</td>
<td>780390</td>
<td>1123751</td>
</tr>
<tr>
<td>Number of PC's connected to Internet</td>
<td>468886</td>
<td>738911</td>
</tr>
<tr>
<td>Number of Internet users (persons)</td>
<td>549117</td>
<td>824429</td>
</tr>
</tbody>
</table>

Source: INS

Looking at the indicators of economic and financial sector we can observe a quantitative and also a qualitative growth illustrated by the number of equipment, which increased in 2006 over 2005 by about 44%. Also, the PC connected to the Internet increased by about 58%. The number of Internet users in 2006, registered an increase of 50%. The share of enterprises with Internet connection in all active
enterprises registers a value little over 25% remaining at a level similar to that of the previous year. The development of electronic commerce in recent years has resulted in an increasing share of businesses that sell / buy via the Internet, the number of companies conducting e-business activities has tripled. Also, the turnover achieved via the Internet in 2006, recorded an increase of 7.4 percentage points, while the share in total turnover of enterprises increase was of 5.5 percentage points.

Fig.2 Indicators of Internet use in Romanian companies

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 in 2008 at 61th position in the world, among a total of 127 countries.[6] 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 we used secondary data from National Institute of Statistic, National Council of Small and Medium Sized Private Enterprises in Romania, the National Agency for Small and Medium Sized Enterprises and Co-operatives, Ministry of Communications and Information Technology, European Monitoring Center for Information Technology and Eurostat.

Regarding the use of ICT by Transylvanian SMEs we have conducted a survey based on a questionnaire with their entrepreneurs or managers. The sample, which included a number of 257 SME’s from Transylvania Region of Romania, has been chosen using the lists of the Chamber of Commerce and Industry. The questionnaire is a part form a broader research concerning the factors influencing the efficiency of strategic leadership in small and medium size enterprises in the globalization and regionalization and had been applied in November-December 2007.

3.2. Sample characteristics
Our sample comprises 35 micro enterprises (13.6%), and an equal number of 111 small and medium enterprises (43.2% each category).

Tabel 3 The structure of enterprises based on activity and number of employees

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>Main field of activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Production</td>
</tr>
<tr>
<td>1-9</td>
<td>1.6%</td>
</tr>
<tr>
<td>10-49</td>
<td>39.1%</td>
</tr>
<tr>
<td>50-250</td>
<td>59.4%</td>
</tr>
</tbody>
</table>

The vast majority of the investigated SME’s were
founded in 1992-1996 regardless they were micro, small or medium enterprises. A percent of 49.8 of the SME’s are production enterprises, 25.68 % are service companies and 24.52 % are commerce enterprises.

3.3. Results

Regarding the use of ICT in the Transylvanian SMEs the results of our study show that almost 60% of the companies do not have Intranet network and the average number of work places equipped with computers is 7.33. An average of 34 % of the internal and external correspondence is conducted via E-mail.

<table>
<thead>
<tr>
<th>Tabel 4 Mode of conducting the correspondence</th>
<th>Minim</th>
<th>Maxim</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of internal and external correspondence is done traditionally</td>
<td>0</td>
<td>100</td>
<td>70.723</td>
<td>28.97</td>
</tr>
<tr>
<td>Percentage of internal and external correspondence is done by E-mail</td>
<td>0</td>
<td>100</td>
<td>34.192</td>
<td>29.60</td>
</tr>
</tbody>
</table>

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 importance of this kind of activities for the SMEs.

Fig. 3 Use of IT in Transylvanian SMEs

The number of R&D employees working full-time in IT is very small (Mean=0.81). 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).

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.

Fig 4. Information technology level by field of activity

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. Firm size influences the level of IT technology used (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). Small enterprises are the ones that use more leader technologies while the micro companies use a low level IT technology.

Table 5. Information technology level by company’s dimension

<table>
<thead>
<tr>
<th>Number of employees</th>
<th>Leader (%)</th>
<th>Medium (%)</th>
<th>Left Behind (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-9</td>
<td>4.17</td>
<td>41.67</td>
<td>54.17</td>
</tr>
<tr>
<td>10-49</td>
<td>13.79</td>
<td>57.47</td>
<td>28.74</td>
</tr>
<tr>
<td>50-249</td>
<td>5.75</td>
<td>70.11</td>
<td>24.14</td>
</tr>
</tbody>
</table>

We didn’t find significant links between the extent the companies meet the conditions of modernity in terms of ability to process information with the help of computers and the main field of activity or their dimension. Regardless of size or field of activity, companies consider that the level of modernity in terms of information processing ability with the help
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
For SMEs, cyberspace can be a real pad for launch or re-launch, as they enjoy a simple organizational structure and not too bureaucratic.

Although in terms of resources (financial, technological and human), SMEs are disadvantaged compared with large firms, organizational and behavioral flexibility is a considerable asset in the fight to conquer the virtual market. Among the actions that could be taken to improve the use of ICT in private sector are:

☐ the support of SMEs' access to the Internet and related services;
supporting the providers of electronic communications networks to expand and modernize the infrastructure in areas where the market can not sustain this, so as to the access to Internet via broadband connections to be possible;

conducting an information campaign for SMEs about the benefits of IT use.

References: