

KNOWLEDGE RELATED ACTIVITIES IN ROMANIAN SMES

*Ovidiu Nicolescu*¹
*Sebastian Ceptureanu*²
*Eduard Ceptureanu*³

ABSTRACT: Knowledge is seen in our day as the main driving force behind productivity, performance and economic growth, shifting the focus to information, technology and learning and their role in economic performance. The growing codification of knowledge and its transmission through communications and computer networks are shaping an 'information society'. Considering the evolution towards the knowledge based economy and the role of SMEs in Romanian economy and adding the fact that Romania is a New Member state of European Union, it is imperative for decision makers to determine the current situation of several key activities regarding SMEs beaconing a possible shift in entrepreneurs priorities.

Key words: knowledge, innovation, IT&C, SMEs

JEL codes: D8, L2, M1

Introduction

Knowledge based economy and knowledge based management are important issues on European Union agenda. For Romania, part of European Union, is decisive to reduce gaps with other, more developed countries in this area, and the only possible way is transforming its economy in a knowledge based one.

The current paper analyzes several areas with great impact on this process.

Innovation activities

In order to create a general perspective on small and medium enterprises in Romania, apprehension of the innovative activities developed within these institutions has an essential role. The undertaken research revealed that innovative efforts within SMEs were especially focused on new products (34.87%), new technologies (26.99%), new managerial and marketing approaches (15.92%), renewing the informational system (13.77%) and human resources training (13.46%). We also highlight the relative low percentage of companies where the absence of innovative approaches was noticed (21.18%), demonstrating that Romanian entrepreneurs are aware of the fact that as the competition increases within each activity field, innovation represents an efficient method to insure a high competitiveness. See fig. no. 1.

¹ The Bucharest Academy of Economic Studies, Management Faculty, Bucharest, Romana Sq. no. 6, sector1, inst.manager@gmail.com

² The Bucharest Academy of Economic Studies, Management Faculty, Bucharest, Romana Sq. no. 6, sector1, ceptureanu@yahoo.com

³ The Bucharest Academy of Economic Studies, Management Faculty, Bucharest, Romana Sq. no. 6, sector1, eduard_ceptureanu@yahoo.com

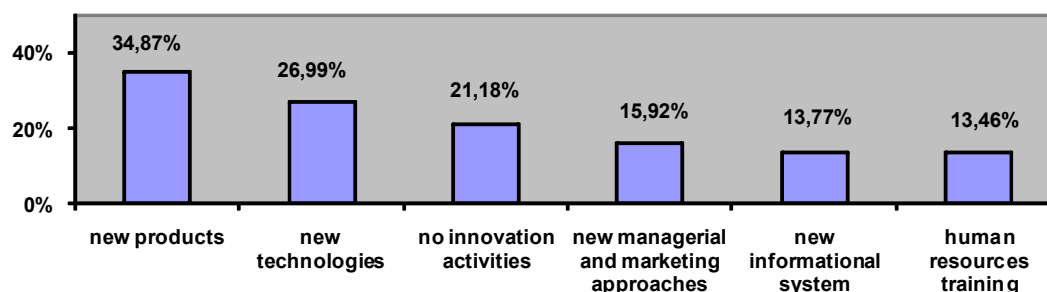


Fig. no. 1 - Innovation activities within SMEs

Analysing innovation activities in Romanian SMEs by **size classes** (table no. 1), we noticed that the percentages of companies with a view for new products, new technologies, new managerial and marketing approaches, new informational systems and human resources training increase together with the enterprises' size.

Table no. 1

Innovation activities within SMEs by size classes

No	Innovation activities	Size classes		
		Micro enterprises	Small enterprises	Medium enterprises
1.	New products	30.75%	41.82%	44.54%
2.	New technologies	20.50%	36.36%	44.54%
3.	New managerial and marketing approaches	14.25%	18.18%	21.85%
4.	New informational systems	11.50%	17.58%	18.49%
5.	Human resources training	11.38%	16.97%	18.49%
6.	No innovation activities	27.13%	12.12%	5.88%

Analyzing innovative activities within SMEs on fields of activity reveals the following aspects: new products are the most frequently among enterprises within tourism (52.63%), big efforts in order to develop new technologies are undertaken within companies activating in the industrial field (45.33%), the improved managerial/ marketing approaches and the human resources training are observed in a higher proportion in constructions (22.58% and 32.26%), the interest for new informational systems is more well-marked in services (17.29%) and the absence of innovation activities is frequently recorded for companies in transportation (26.20%). See table no. 2 for further details.

Table no. 2

Innovation activities within SMEs by fields of activity

No	Innovation activities	Fields of activity					
		Industry	Constructions	Trade	Tourism	Transportation	Services
1.	New products	47.56%	32.26%	31.25%	52.63%	39.30%	24.30%
2.	New technologies	45.33%	45.16%	18.13%	34.21%	21.12%	23.83%
3.	New managerial and marketing approaches	15.11%	22.58%	18.13%	15.79%	11.76%	18.69%
4.	New informational systems	12.89%	12.90%	14.38%	2.63%	11.23%	17.29%
5.	Human resources training	12.00%	32.26%	10.63%	23.68%	9.89%	16.12%
6.	No innovation activities	11.11%	6.45%	24.38%	15.79%	26.20%	22.43%

Investments in innovation

Considering the part of SMEs' investments dedicated to innovation (products, processes or organization), we observed that in most of the enterprises subject to our research (22.17%) there is no interest for innovation activities. These are followed by the companies that dedicated for innovation between 5-10%, 10-20% and 0-5% of the invested amounts (with weights of 20.00%, 19.25%, respective 18.21%), companies with investments of 20% and 50% (13.40%), and the last position goes to economic agents with investments of more than 50% of the investments fund (with a weight of 6.98% of the SMEs). One can notice that most of the SMEs accomplish– in a higher or lower degree – innovative investments, which actually make the difference between companies, generating competitive advantage. See fig. no. 2.

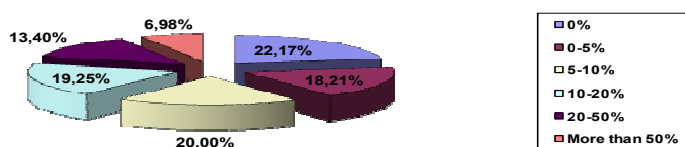


Fig. no. 2 - SMEs' investments in innovation

Analysing SMEs' investments in innovation by **size classes** (table no. 3), we observe that: the percentages of SMEs investing in innovation weights from 5 to 10% and 10-20% increase in a direct proportion to the companies' size, and the proportion of companies that have no innovation activities decreases together with the enhancement of the enterprises, due to the differences regarding the economic potential. As for enterprises investing 20-50% and more than 50% in innovation, the highest weight is covered by small sized enterprises (22.67% and 9.00%) and the lowest by micro enterprises (8.37% and 5.89%).

Table no. 3

SMEs' investments in innovation by size classes

No	Part of investments dedicated to innovation	Size classes		
		Micro enterprises	Small enterprises	Medium enterprises
1.	0%	29.46%	10.67%	9.17%
2.	0-5%	19.38%	16.33%	16.51%
3.	5-10%	19.22%	20.33%	24.77%
4.	10-20%	17.67%	21.00%	23.85%
5.	20-50%	8.37%	22.67%	17.43%
6.	More than 50%	5.89%	9.00%	8.26%

If we classify SMEs on **economic fields of activity**, we notice the following aspects:

- enterprises that allocated to innovation more than 50% of investments register higher percentage in constructions (14.29%) and lower in trade business (2.26%);
- as for the SMEs that accomplished no innovative activities in the last year, the highest percentage belongs to the companies in trade business (29.32%) and the lowest to the companies within industry (12.82%);

- enterprises within tourism register a higher percentage regarding the investments in innovation of 10-20% (27.03%) and lower proportions if we take into account investments of 5-10% and 20-50% (13.51%, respective 8.11%).

See table no. 4 for further details.

Table no. 4

SMEs' investments in innovation by fields of activity

No.	Part of investments dedicated to innovation	Fields of activity					
		Industry	Constructions	Trade	Tourism	Transportation	Services
1.	0%	12.82%	17.86%	29.32%	24.32%	25.57%	21.79%
2.	0-5%	15.90%	14.29%	21.05%	16.22%	15.86%	20.95%
3.	5-10%	24.62%	14.29%	21.05%	13.51%	19.42%	18.72%
4.	10-20%	25.13%	21.43%	14.29%	27.03%	18.77%	17.32%
5.	20-50%	13.85%	17.86%	12.03%	8.11%	15.21%	12.29%
6.	More than 50%	7.69%	14.29%	2.26%	10.81%	5.18%	8.94%

Products and services innovation

Analysing the part of turnover generated by new or renewed products and/ or services introduced in the last year, we notice that: 21.53% of the enterprises hold a percentage of 5-10%; 21.24% of the economic agents had no innovation activities in 2007; 19.31% of SMEs register a 10-20% percentage; 17.86% of the companies register a 0-5% percentage and 14.58% register a 20-50% percentage. Only in 5.50% of the SMEs, the turnover resulted more than 50% from new and/ or renewed products and/ or services. Taking into account these aspects, we may conclude that the processes of products innovation are relatively frequent for the majority of the SMEs in Romania. A graphical representation of this situation is designed by the fig. no. 3.

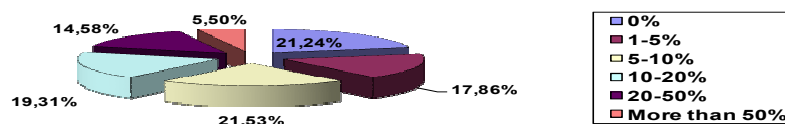


Fig. no. 3 - Part of SMEs' turnover generated by innovation

In terms of SMEs **size classes** (see table no. 5), we noticed that: the weight of the firms with no innovation activity increases in an inverse proportion with the SMEs' size, and the number of enterprises with a 5-10% percentage from their turnover generated by new products/services increases as the size of the firm increases as well. As for the enterprises having 10-20%, 20-50% and more than 50% of their turnover generated by new products/services, the small sized companies hold the highest weights (23.21%, 22.18%, respective 6.83%).

Table no. 5

Part of SMEs turnover generated by innovation – classification by size classes

No.	Part of turnover generated by innovation	Size classes		
		Micro enterprises	Small enterprises	Medium enterprises
1.	0%	27.85%	10.92%	9.52%
2.	0-5%	19.62%	12.97%	20.95%
3.	5-10%	19.30%	23.89%	27.62%
4.	10-20%	16.93%	23.21%	22.86%
5.	20-50%	11.08%	22.18%	15.24%
6.	More than 50%	5.22%	6.83%	3.81%

The analysis of The SMEs by **fields of activity** highlights the following aspects: as for the enterprises with no innovation activities the highest weight is registered in trade business (25.58%) and the lowest one in constructions (10.34%). If we consider the firms having more than 50% of their turnover generated by new products/services the highest percentage is recorded by the companies in tourism (11.11%), and the lowest one among those in constructions (3.45%). The economic agents operating in construction also hold the highest weight of firms with 0-5% and 20-50% (27.29%, respective 31.03%) of their turnover generated by new products/services. See table no. 6.

Table no. 6

Part of SMEs turnover generated by innovation – classification by Fields of activity

No.	Part of turnover generated by innovation	Fields of activity					
		Industry	Constructions	Trade	Tourism	Transportation	Services
1.	0%	15.26%	10.34%	25.58%	22.22%	23.36%	21.84%
2.	0-5%	18.42%	27.59%	17.05%	5.56%	16.45%	19.54%
3.	5-10%	22.11%	13.79%	18.60%	16.67%	22.04%	22.99%
4.	10-20%	23.68%	13.79%	20.93%	19.44%	21.05%	15.23%
5.	20-50%	15.26%	31.03%	11.63%	25.00%	12.83%	14.37%
6.	More than 50%	5.26%	3.45%	6.20%	11.11%	4.28%	6.03%

Use of information technology within SMEs

Considering the use of IT in Romanian SMEs (fig. no. 4), the outcome of our research showed that: 82.25% of them possess computers, 72.93% of the SMEs have access to the Internet, 61.07% use the e-mail, 21.50% have Intranet, 11.54% have their own website and 6.77% operate on-line transactions. We also have to point out the fact that 7.32% of the SMEs do not use the information technology at all. The outcome of this research underlines the efforts for computerization activities within Romanian SMEs and their compliance with the European standards.

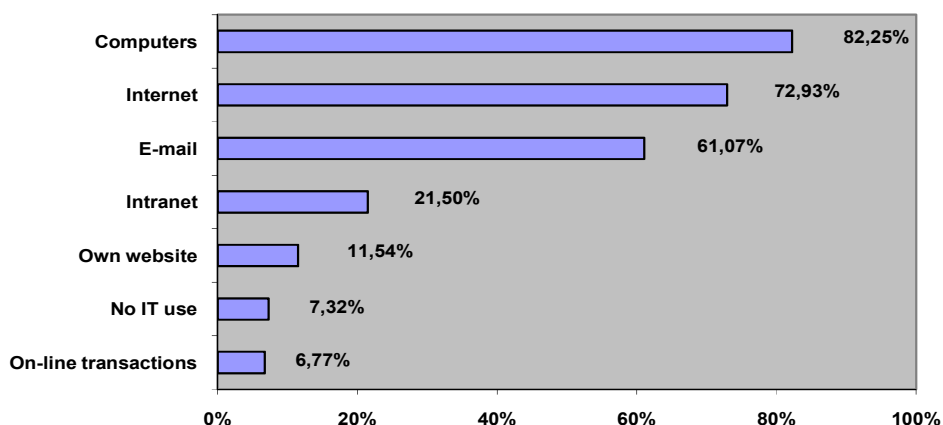


Fig. no. 4 - Used IT components within SMEs

If we classify **SMEs by regional location**, we notice the following important differences compared to sample average:

- SMEs in North West register the highest percentages of enterprises that have computers (88.57%), use e-mail (85.71%), the Internet (88.57%) and the Intranet (41.43%);
- In Bucharest we have the lowest number of firms that use the e-mail services (50.25%), have Intranet (11.42%) or their own website(7.87%);
- Small and medium sized enterprises in the Western region distinguish themselves through the higher number of companies using the on-line transactions services (14.06%) and do not use the IT (15.63%), but also through the lowest percentages of SMEs equipped with computers (68.75%) and that use the internet (64.06%);
- companies from South East distinguish themselves by the higher weight of SMEs that own a website (20.63%) and the lower weight of firms that use the on-line transactions services (2.50%).

We conclude that, taking into account the used computerized technology, the North Western region is the most advanced and Bucharest occupying the opposite position. See table no. 7.

Table no. 7

Used IT components within SMEs by development regions

No.	Used IT components	Development regions							
		North East	South East	South	South West	West	North West	Center	Bucharest
1.	Computers	87.59%	75.63%	80.43%	72.63%	68.75%	88.57%	86.96%	84.52%
2.	E-mail	66.17%	59.38%	65.22%	60.00%	57.81%	85.71%	78.26%	50.25%
3.	Internet	74.06%	66.25%	77.54%	67.37%	64.06%	88.57%	78.26%	72.34%
4.	Intranet	21.80%	20.00%	27.54%	24.21%	34.38%	41.43%	33.33%	11.42%
5.	Firm's own website	9.40%	20.63%	8.70%	12.63%	17.19%	14.29%	15.94%	7.87%
6.	On-line transactions	7.14%	2.50%	10.14%	12.63%	14.06%	12.86%	5.80%	3.55%
7.	No IT components are used	6.02%	9.38%	12.32%	11.58%	15.63%	2.86%	5.80%	4.31%

Analysing SMEs by **size classes** we notice that the percentage of companies using computers, e-mail, Internet and Intranet, have their own site and use sales/ shopping on-line

increases proportionally with the companies' size and the percentage of enterprises that do not use computerized technology increases with the decrease of companies. This situation is normal, considering that when SMEs increase, their economic potential increases, determining the growth of capacity but also of necessity to use certain IT components. See table no. 8 for details.

Table no. 8

Used IT components within SMEs by size classes

No	Used IT components	Size classes		
		Micro enterprises	Small enterprises	Medium enterprises
1.	Computers	78.25%	89.39%	89.92%
2.	E-mail	52.63%	72.42%	85.71%
3.	Internet	67.00%	81.52%	89.08%
4.	Intranet	12.50%	32.12%	52.10%
5.	Firm's own website	9.88%	14.24%	15.97%
6.	On-line transactions	3.75%	11.21%	15.13%
7.	No IT components are used	10.25%	2.73%	0.84%

In terms of the SMEs' activity field, we underline the following significant differences compared to the average sample of analyzed companies:

- SMEs within transportation register the lowest percentage of enterprises equipped with computers (77.27%), that use e-mail, Internet and Intranet (49.20%, 60.70%, respective 13.64%), and hold also the highest weight of companies that do not use IT components (11.50%);
- enterprises in the constructions field hold higher percentages of companies having access to e-mail and internet services (80.65. respective 90.32%), making on-line transactions (12.90%) and surprisingly this field has no record of firms having their own website;
- in the tourism sector we find the most numerous firms equipped with computers (92.11%) and Intranet (34.21%), but there are no organizations using the on-line transactions;
- enterprises in the industrial field register the lowest weight of firms that do not use IT components (2.67%).

See table no. 9.

Table no. 9

Used IT components within SMEs by fields of activity

No	Used IT components	Fields of activity					
		Industry	Constructions	Trade	Tourism	Transportation	Services
1.	Computers	86.67%	90.32%	77.50%	92.11%	77.27%	84.58%
2.	E-mail	72.00%	80.65%	55.00%	60.53%	49.20%	66.59%
3.	Internet	80.89%	90.32%	65.63%	78.95%	60.70%	80.37%
4.	Intranet	27.56%	29.03%	18.13%	34.21%	13.64%	24.77%
5.	Firm's own website	12.00%	0.00%	6.25%	15.79%	8.29%	16.59%
6.	On-line transactions	10.22%	12.90%	5.00%	0.00%	5.08%	7.24%
7.	No IT components are used	2.67%	3.23%	6.25%	5.26%	11.50%	7.01%

The use of Internet/Intranet in SMEs

As for the purpose of using Internet/Intranet in SMEs, the research shows that 62.34% of the entrepreneurs communicate with suppliers/clients, 61.86% of the entrepreneurs are looking to get information regarding the business environment, 28.50% use Internet/Intranet to communicate easier within the enterprise, while 24.84% use these IT components for transactions, contracts and payments. See fig. no. 5.

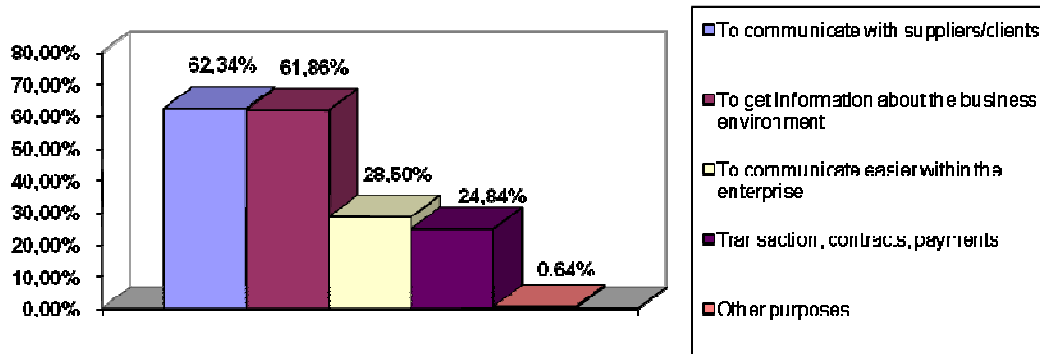


Fig. no. 5 - The purpose of using Internet/Intranet in SMEs

Classifying SMEs by development regions, we notice that: companies within the North Western region register the highest percentage of enterprises that use Internet/Intranet to communicate with suppliers or customers (67.14%), and SMEs within the Center region have a view for the communication within the organization (33.33%) and getting information about the business environment (71.01%). SMEs within the Western region hold the highest percentage of companies having as a purpose the transactions, contracts and payments (40.63%), but also the lowest weights of companies with a view to facilitate the communication within the enterprise (17.19%) and to get information about the business environment (51.56%).

Conclusions

- Innovative activities within SMEs were focused especially on new products (34.87%), new technologies (26.99%), new managerial and marketing approaches (15.92%), new/improved informational systems (13.77%) and human resources training (13.46%) and in 21.18% of the companies innovative activities didn't exist

- Taking into account the percentage of investments dedicated to innovation in products, processes or organization, the majority of enterprises subject to our research (22.17%) register no innovative activities. These are followed by the companies that register a percentage of 5-10%, 10-20% and 0-5% of the investment fund (with weights of 20.00%, 19.25%, respective 18.21%), companies with investments of 20-50% (13.40%), and the last position is held by economic agents with investments of more than a half of the investment fund (with a weight of 6.98% of the SMEs).

- Innovation investments of more than 50% are more frequent for the SMEs with more than 15 years of experience (10.14%), enterprises in North West (14.71%), small sized companies (9%), companies with other juridical status (10.91%) and firms within constructions (14.29%)

- Almost 1/5 of the enterprises hold a percentage of 10-20% from their turnover generated by new products/services and 21.24% of the economic agents made no innovation efforts in 2007

- Only in 5.50% of the SMEs turnover is generated by new products/services in a proportion of more than 50%.

- More than 80% of the small and medium enterprises have computers, almost 3/4 of the companies use Internet and more than 60% of the companies use the e-mail services

- 7.32% of the SMEs do not have computers/ their own website, do not use internet/intranet/e-mail and do not accomplish sales/ acquisition on-line

- Companies that use computers register higher weights among enterprises in North West (88.57%), medium sized companies (89.92%) and economic units from tourism (92.11%)

- The Internet/Intranet is more frequently used for communication with suppliers/customers (in 62.34% of the SMEs), in order to get information about the economic

environment (61.86%), to facilitate the communication within the company (28.50%) and to perform transactions, contracts and payments (24.84%).

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