The Impact of the Information Technologies on the Accounting Department of the Romanian Companies

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Abstract—The need to use high volumes of data and the high competition are only two reasons which make necessary the use of information technologies. The objective of our research is to establish the impact of information technologies on the accounting department of the Romanian companies. In order to achieve it, starting from the literature review we made an empirical research based on a questionnaire. We investigated the types of technologies used, the reasons which led to the implementation of certain technologies, the benefits brought by the use of the information technologies, the difficulties brought by the implementation and the future effects of the applications. The conclusions show that there is an evolution in the degree of implementation of the information technologies in the Romanian companies, compared with the results of other studies conducted a few years before.

Keywords—Information technologies, impact, company, Romania, empirical study.

I. INTRODUCTION

THE present economic environment is characterized by the need to work with big volumes of data, competition, complexity, frequent changes etc. In this context, the information technologies (IT) become a need for the survival of the companies, instead of a competitive advantage. The pressures put on the information technologies led to their development, making them capable to answer the present difficulties of the companies.

The enterprise systems promise a set of correlated information, which help the management to reach its strategic objectives. With their help, the companies face easier the new realities. Yet, in Romania, these systems are used in less than half of the companies. In the same time, there are still operations made with other applications (for instance, Excel).

Previous studies show a varied range of benefits generated by the information technologies, but also a great number of difficulties generated by their adoption. In the same time, managers have different reasons to choose the information technologies. After the implementation, previous studies report varied potentialities of the information technologies. In this research we followed the manner in which the different types of information technologies influence the activity of the persons employed in the accounting departments of the

companies in Romania. We started from the hypothesis that the IT has a positive impact, bigger and bigger, on these departments. Yet, in our study we pursued all the aspects which have to be taken into account by a person who decides to implement technologies: the reason for choosing, the expected benefits, and the difficulties encountered, the future effects which can be exploited.

This paper is structured as it follows: after presenting the literature review regarding the impact of information technologies, we detailed the research methodology. The description of the results of a research based on a questionnaire follows. In the final part of the paper we presented the discussion and conclusions.

II. LITERATURE REVIEW

In accounting, information and knowledge occupy a central place. The accounting department of the company implies making operations which involve a high volume of information, such as collecting, organizing, processing, assessing and presenting data. This is why we consider that the implementation of the information technologies in these departments can generate important benefits. Yet, the advantages are not necessarily quantifiable (such as, for instance, an improvement of the company's productivity), they can also be intangible (for instance, transforming the work of the accountants, which can lead in the end to an increase in productivity). Potential effects of the use of IT are the dematerialization of the documents and procedures, the inter-organizational information systems, the definition of the roles in organizations and the improvement of the managerial processes [1]-[3].

An important factor for the success of the implementation of the information technologies is their strategic alignment with the company in which they are used, phenomenon searched by several authors [4], [5]. Many studies [6]-[8] etc. were directed towards the relationship between the appropriate implementation of the IT and the business development.

Previous studies focused on the analysis of the impact of information technologies on the financial accounting [9], [4], management accounting [10], [5], [6], [11], [12], financial audit [13]-[15] etc.

The most advanced information technologies used nowadays in the accounting department are the ERP systems. They represent complete and complex solutions which integrated the entire activity of a company.

In the questionnaire we used the classification suggested by [16] in order to describe the benefits.

To justify the IT investments, the managers have to mention

the expected benefits. The benefits identified by other authors can be summarized as presented in Table I.

TABLE I [24]
CATEGORIES OF BENEFITS IDENTIFIED IN PREVIOUS STUDIES

Study	Categories of benefits
[17]	Economic, technical, organizational, and social benefits
[18]	Overall benefit, organizational profitability, market competition, cost reduction
[19]-[22]	Analyse the benefits through the Balanced Scorecard perspective: internal processes dimension, customer dimension, learning and growth dimension, financial dimension
[23]	Tangible and intangible benefits
[16]	Operational, managerial, strategic, IT infrastructure, organizational

TABLE II [32]
CATEGORIES OF DIFFICULTIES IDENTIFIED IN PREVIOUS STUDIES

Study	Categories of difficulties
[25]	Categories of problems identified by enterprise system's adopters: employees, enterprise, system, IT infrastructure, system misfit, system replacement, training, implementation process, system vendor
[26]	Categories of problems identified by experts: economic, technical, organizational, social
[27]	Managerial problems during and after ERP implementation: project cost overrun, project delays, conflicts with business strategy, employees resistance to change, conflicts with consultants, internal conflicts, conflicts with vendors. Technical problems: integration with existing systems, customization, integration with other applications, European currency, security, other
[28]	Technical, operational and legal aspects
[29]	Companies: Budget over-run, time over-run, lack of benefit, meets or does not meet business plan criteria
[30]	Critical impediments are from functional coordination problems related to inadequate support from functional units and coordination among functional units, the project management related to business process change, and change management related to resistance of users
[31]	Problems encountered with migration of ERP systems from the point of view of the adopters: time needed for implementing the new version, technical problems with the new version, bad estimates by migration partner(s), costs involved, strain on the organization, quality of the migration support tools

TABLE III
VARIABLES USED

Question	Variable	Description
I2	SER 01	Turnover
I5	SER 02	Existence of a computers network
II.1	SER 03	The computerization of the accounting department
II.2	SER 04	Type of software used in the accounting department
II.4	SER 05	Percentage of works made with Excel
II.6A	SER 06	Operational benefits
II.6B	SER 07	Strategic benefits
II.6C	SER 08	Managerial benefits
II.6D	SER 09	IT infrastructure benefits
II.6E	SER 10	Organizational benefits
II.8A	SER 11	Dematerialization of the documents and procedures
II.8B	SER 12	Computerization of the inter-organizational relationships
II.8C	SER 13	Redefinition of roles within organizations
II.8D	SER 14	Improvement of the managerial processes
II.9	SER 15	Percentage in which the software corresponded to the expectations of the respondent

The biggest part of the literature studying the difficulties encountered in the process of the implementation of the information technologies in the accounting department relates with the ERP systems. These are the most complex applications used within the accounting department. In Table II we present next a synthesis of the problems mentioned by previous studies.

In the questionnaire we used the classification suggested by [26] to analyze the difficulties.

III. RESEARCH METHODOLOGY

Our research is founded on the results obtained at a questionnaire which pursued to test the opinion of the accountants regarding the impact of information technologies. The questionnaire included fourteen questions. They were split into two parts. The first part included five questions about the company: the number of employees, the turnover registered in 2013, the amount of the total assets in 2013, the domain in which the company activated, the existence of a computers network in the company. The second part included nine questions about the IT systems used in the accounting department, such as the most important criteria for choosing the IT systems, the positive effects generated by the use of the IT systems, the difficulties which appeared in the implementation of the IT systems, the future effect of the use of information technologies on the company. The questionnaire was pre-tested by two academics. A few changes were required, so that the questions would be more clearly formulated. The questionnaire was disclosed on Google Drive in September, 2014. We contacted a company which helped us gather answers. By November 15th 77 answers were received.

The variables were codified as presented in Table III.

The following research hypotheses were formulated (restructured on two classes of presumptions specific to the research):

1. The variable defined by the existence of a unique computers network in the company as an exogenous variable (I.5 as an explanatory variable):

1.1. The company's turnover can be modelled by a variable generated by the existence of a unique computers network within the company;

1.2. The future effect on the company generated by the use of the information technologies depends directly on the existence of a unique computers network within the company;

1.3. Most of the advantages obtained after the implementation of the financial-accounting software within the company depend on the existence of a unique computers network within the company;

2. The variable defined by the existence of a unique computers network at the company's level as an endogenous variable (I.5 as an explained variable):

2.1. The existence of a unique computers network within the company depends on the IT systems/software;

2.2. The existence of a unique computers network within the company depends on the percentage of activities performed in the Accounting Department with Excel or similar software.

All the hypothesis are satisfied according to the correlation

matrix and can generate models which will be tested and validated.

The data was analyzed using the statistics software Eviews.

TABLE IV
MOST IMPORTANT CRITERIA

Criteria	Percentage	Rank
The complexity of the application and the fact that it covers the entire activity of the company	68%	1
Quality/cost report	68%	1
The reports generated by the software	57%	3
The availability of the seller to change the application according to the requests of the company	41%	4
The recommendations regarding the applications, especially the ones received from companies in the same activity domain	38%	5
The friendly interface	38%	6

TABLE V
BENEFITS OBTAINED

Benefit	Percentage	Rank
Operational benefits	98%	1
Managerial benefits	88%	2
IT infrastructure benefits	79%	3
Organizational benefits	63%	4
Strategic benefits	57%	5

TABLE VI
DIFFICULTIES ENCOUNTERED

Benefit	Percentage	Rank
Organizational	48%	1
Technical	43%	2
Economic	25%	3
Social	20%	4

IV. RESEARCH RESULTS

A. Preliminary Analysis

We obtained 77 answers to our questionnaire. In order to analyze the companies represented by the respondents in term of size we used three variables: the number of employees, the turnover, the total amount of assets. 35% of the companies had less than 25 employees, 53% had an average number of employees between 25 and 100 and 12% of the companies had more than 100 employees.

The amount of the turnover registered in 2013 was less than 100,000 EUR for 23% of the companies, between 100,001 and 1,000,000 EUR for 52% of the companies and more than 1,000,000 EUR for 25% of the companies. For the amount of the total assets we used the same intervals as for the turnover and the percentages were: 36%, 43% and 19%, respectively.

Thus, in terms of size, we can say that we have a good representation of our sample.

The most important criteria used to select the software are presented in Table IV. The percentage is computed as the number of respondents identifying a certain criteria and the total number of answers.

In a study performed by [24] on a sample of distribution companies implementing SAP in Asia resulted that the first criteria were the friendly interface or the name of the IT company (87.5%), while the complexity of the application and the fact that it covers the entire activity of the company and the quality/cost report were mentioned by 12.5% of the respondents (rank 6). The differences between these two studies can be determined by the fact that in the present study we considered all the types of software (not only SAP), we referred to all the activity domains and to another country than the study mentioned above.

Most of the companies in our sample (54%) use Excel or similar software for less than 33% of the work performed in the accounting department. Excel is used for: the preparation of the cash flow statement (eight respondents), the preparation of the budgets (seven respondents), various reports (three respondents), various analyses etc. (one respondent).

As a consequence of the implementation and use of the information systems, the respondents identified the benefits presented in Table V.

Comparing these results with the ones reported by [24] we notice that the operational benefits are ranked first in both studies, while the IT infrastructure benefits are ranked third in this study and last in the previously cited paper (with only 1.75%). The respondents to the cited study were cautious in reporting benefits the biggest percentage being 61.4% and registering three percentages below 4%.

A few respondents enumerated other benefits (one respondent mentioned each benefit): permanent adaptation to the requirements of business application; achieving the default business; centralization of information; elimination of transcription errors that may occur by automating information; a greater traceability of income; improving the quality of customer service; connection between departments; a better structure and organization of data processing required statements for management decisions; professional performance; the reduction of working time; better control over the work.

The percentages and ranks of the difficulties encountered in the process of implementation of the information systems as reported by the respondents are presented in Table VI.

As future effects of the implementation and use of the information technologies the respondents reported: the improvement of the managerial processes (80% of the respondents), the computerization of the inter-organizational relationships (75%), the redefinition of the roles in the organizations (57%) and the dematerialization of the documents and procedures (45%). Other future effects mentioned by the respondents were: the reduction of the decision-making time, saving resources, generation of correct and coherent information, a better analysis of the costs, the possibility of integration of the accounting software.

The biggest part of the respondents (71%) considers that the information systems implemented in the accounting departments corresponded to their requests in a percentage higher than 50%.

B. Regression Analysis

Fifteen variables were analyzed using a correlation matrix. The first variable starts from question I.2 whose answers were codified as -1, 0, 1 according to the turnover's level, and

afterwards fourteen other explanatory or endogenous variables were analyzed. The extended correlation matrix is presented in Table VII.

TABLE VII
EXTENDED CORRELATION MATRIX

	SER01	SER02	SER03	SER04	SER05
SER01	1.000000	**0.445733**	0.109077	**0.243936**	-0.038579
SER02	**0.445733**	1.000000	0.061432	**0.227119**	**-0.234327**
SER03	0.109077	0.061432	1.000000	-0.018784	-0.088941
SER04	**0.243936**	**0.227119**	-0.018784	1.000000	**-0.289362**
SER05	-0.038579	**-0.234327**	-0.088941	**-0.289362**	1.000000
SER06	0.173259	0.195906	0.090377	0.119260	**-0.284783**
SER07	-0.095109	0.075092	0.123687	0.019663	-0.116923
SER08	0.168297	0.166667	0.145497	0.007172	0.111143
SER09	0.053549	0.161111	**0.245959**	0.035861	**-0.267439**
SER10	0.053824	0.043033	**0.325582**	0.073148	-0.128240
SER11	**0.281341**	0.344301	0.009258	0.270163	-0.126410
SER12	0.053170	0.055604	0.094386	0.178962	-0.106219
SER13	-0.055114	0.088552	0.046383	0.015548	**-0.224102**
SER14	0.012993	0.013587	0.059307	**0.278222**	-0.134969
SER15	0.184047	**0.230719**	-0.059910	0.163695	**-0.229233**
	SER06	**SER07**	**SER08**	**SER09**	**SER10**
SER01	0.173259	**-0.095109**	0.168297	0.053549	0.053824
SER02	0.195906	**0.075092**	0.166667	0.161111	0.043033
SER03	0.090377	**0.123687**	0.145497	0.245959	0.325582
SER04	0.119260	**0.019663**	0.007172	0.035861	0.073148
SER05	-0.284783	**-0.116923**	0.111143	-0.267439	-0.128240
SER06	1.000000	**0.132521**	0.238909	0.382255	0.277587
SER07	0.132521	**1.000000**	0.286910	0.419738	0.371770
SER08	0.238909	**0.286910**	1.000000	0.333333	0.408815
SER09	0.382255	**0.419738**	0.333333	1.000000	0.371161
SER10	0.277587	**0.371770**	0.408815	0.371161	1.000000
SER11	0.114011	**0.039892**	0.031814	0.021209	-0.063662
SER12	0.230814	**0.127774**	0.139010	0.173762	0.083001
SER13	0.102056	**0.252033**	0.233778	0.340041	0.314839
SER14	-0.037331	**0.128501**	0.271746	0.073598	0.315741
SER15	0.406146	**0.181897**	0.176471	0.294118	0.244909
	SER11	**SER12**	**SER13**	**SER14**	**SER15**
SER01	0.281341	**0.053170**	-0.055114	0.012993	0.184047
SER02	0.344301	**0.055604**	0.088552	0.013587	0.230719
SER03	0.009258	**0.094386**	0.046383	0.059307	-0.059910
SER04	0.270163	**0.178962**	0.015548	0.278222	0.163695
SER05	-0.126410	**-0.106219**	-0.224102	-0.134969	-0.229233
SER06	0.114011	**0.230814**	0.102056	-0.037331	0.406146
SER07	0.039892	**0.127774**	0.252033	0.128501	0.181897
SER08	0.031814	**0.139010**	0.233778	0.271746	0.176471
SER09	0.021209	**0.173762**	0.340041	0.073598	0.294118
SER10	-0.063662	**0.083001**	0.314839	0.315741	0.244909
SER11	1.000000	**0.133412**	-0.039892	-0.036743	0.136614
SER12	0.133412	**1.000000**	0.270319	0.335256	0.253488
SER13	-0.039892	**0.270319**	1.000000	0.427373	0.106888
SER14	-0.036743	**0.335256**	0.427373	1.000000	0.010657
SER15	0.136614	**0.253488**	0.106888	0.010657	1.000000

The significant correlation coefficients are indicated in bold.

The first part of the correlation matrix shows that the turnover is positively correlated with the existence of a unique computers network in the company (I5 being exogenous variable in this first case), the type of software used in the accounting department and the dematerialization of the documents and procedures. The existence of a unique computers network is in relation with the turnover, and with the use of the information technologies as a consequence of the dematerialization of the documents and procedures, as well as the expectations related with the optimum implementation of the accounting software (I5 being a endogenous variable in the second case).

The way in which the computerization of the accounting department was achieved (by developing software within the company, by purchasing software from one specialized company, by purchasing software from several specialized companies) is positively correlated with the IT infrastructure benefits and the organizational benefits perceived by the respondents.

The type of software used in the accounting department (ERP, independent software purchased from one company, independent software purchased from several companies) is positively correlated with the turnover, the existence of a computer network, the dematerialization of the documents and procedures and the improvement of the managerial processes. We notice that no company with a turnover smaller than 100,000 uses an ERP. Yet, we notice a negative correlation with the percentage of works performed in Excel or in similar software.

It is interesting that our correlation matrix shows only negative correlations between the use of the Excel or similar software in the accounting department and: existence of a computers network, type of software used in the accounting department, operational benefits, IT infrastructure benefits, redefinition of roles within organizations, percentage in which the software corresponded to the expectations of the respondent.

In the second part of the correlation matrix we included the benefits as endogenous variables. We notice that all the benefits are correlated, except for the operational and strategic benefits (which are not correlated as exogenous variables or as endogenous variables). The operational benefits and the IT infrastructure benefits are negatively correlated with the percentage of work made with Excel or similar software, which shows that the use of this type of software is seen by the respondents as a disadvantage. The computerization of the accounting department generates IT infrastructure benefits and organizational benefits (according to our respondents). The computerization of the inter-organizational relationships is seen as an operational benefit, while the redefinition of roles within organizations is correlated with all the types of benefits, except for the operational benefits. The ability of the information technologies used in the accounting department to improve the managerial processes is seen as managerial and organizational benefits. If the software fitted the expectations of the respondents it generated operational, IT infrastructure and organizational benefits.

TABLE VIII
MODEL 1 TESTED

Dependent Variable: SER02

Method: Least Squares
Sample: 1 77
Included observations: 77

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.491578	0.071650	6.860839	0.0000
SER01	0.257182	0.072648	3.540103	0.0007
SER04	0.016631	0.070446	0.236088	0.8140
SER05	-0.116331	0.065120	-1.786396	0.0782
SER11	0.199212	0.101518	1.962326	0.0536
R-squared	0.287820	Mean dependent var		0.649351
Adjusted R-squared	0.248254	S.D. dependent var		0.480302
S.E. of regression	0.416438	Akaike info criterion		1.148572
Sum squared resid	12.48627	Schwarz criterion		1.300767
Log likelihood	-39.22001	F-statistic		7.274511
Durbin-Watson stat	1.870798	Prob(F-statistic)		0.000056

TABLE IX
MODEL 2 TESTED

Dependent Variable: SER01

Method: Least Squares
Sample: 1 77
Included observations: 77

Variable	Coefficient	Std.Error	t-Statistic	Prob.
C	-0.460399	0.140804	-3.269788	0.0016
SER02	0.643334	0.157935	4.073418	0.0001
SER08	0.130942	0.139180	0.940808	0.3499
SER10	0.080482	0.098702	0.815405	0.4175
R-squared	0.212813	Mean dependent var		0.012987
Adjusted R-squared	0.180463	S.D. dependent var		0.697618
S.E. of regression	0.631542	Akaike info criterion		1.969245
Sum squared resid	29.11570	Schwarz criterion		2.091001
Log likelihood	-71.81594	F-statistic		6.578421
Durbin-Watson stat	1.844007	Prob(F-statistic)		0.000536

In the last part of the correlation matrix we presented the variables related with the future effect of the software used in the financial-accounting department of the company and with the percentage in which the software corresponded to the expectations of the respondent. Thus, the dematerialization of the documents and procedures is positively correlated with the turnover, the existence of a computers network and the type of software used in the accounting department. The computerization of the inter-organizational relationship is positively correlated with the operational benefits, the redefinition of roles within organizations, the improvement of the managerial processes and the percentage in which the software corresponded to the expectations of the respondent. The redefinition of roles within organizations is negatively correlated with the percentage of works made with Excel and positively correlated with all the benefits (except for the operational ones, which might mean that after a redefinition of roles a person needs time before improving the productivity), the computerization of the inter-organizational relationships and the improvement of managerial processes. The improvement of managerial processes is a function of the software used (the ERP being seen by our respondents as a software which determines this type of benefit), the managerial benefits, the organizational benefits, the computerization of the inter-organizational relationships and the redefinition of the roles within organizations. Finally, the degree in which the respondents are satisfied with the software used is determined by the existence of a computers network, the operational, IT infrastructure and organizational benefits and computerization of the inter-organizational relationships. Yet, the expectations are negatively correlated with the use of Excel or similar software, which shows that the persons implementing IT in the financial-accounting department are waiting for a change.

Based on the correlation matrix we could test the following model:

$$SER02 = \alpha + \beta SER01 + \gamma SER04 + \delta SER05 + \lambda SER11 + \varepsilon \quad (1)$$

where α, β, γ, δ, λ are the correlation coefficients and ε is the intercept.

This regression analysis tests the relationship between the existence of a unique computers network in the company (SER02), and a series of other elements, such as the turnover (SER01), type of software used in the accounting department (SER04), percentage of works made with Excel (SER05) and dematerialization of the documents and procedures (SER11). The tests performed are presented in Table VIII.

The regression generated for the above data series is:

$$SER02 = 0.491578 + 0.257182 SER01 + 0.016631 SER04 - 0.116331 SER05 + 0.199212 SER11 + \varepsilon \quad (2)$$

The model shows a negative correlation of the existence of a unique computers network with the dematerialization of the documents and procedures.

R^2 coefficient shows a determination of 28.78%, which is above the average level in our model. The F-statistics is above 7 and shows that the model is validated.

Another model that was tested was

$$SER01 = \alpha + \beta SER02 + \gamma SER04 + \lambda SER11 + \varepsilon \quad (3)$$

where: α, β, γ, δ are the correlation coefficients and ε is the intercept.

This regression analysis tests the correlation between the turnover (SER01) and the existence of a unique computers network (SER02), the type of software used in the accounting department (SER04) and the dematerialization of the procedures and documents (SER11). The statistics for this model are presented in Table IX. The equation resulted using the data collected is:

$$SER01 = -0.460399 + 0.643334 SER02 + 0.130942 SER04 + 0.080482 SER11 + \varepsilon \quad (4)$$

R^2 of 21.28% identifies in the model a correlation below the average level. A future modelling is possible, but as the model is not even validated at an average level, it is not competitive.

Four other models (trying to explain the types of software

used in the accounting department, the use of Excel or similar software or the existence of a unique computers network within the company) were tested, but none of them was validated.

V. CONCLUSIONS

Most of our respondents use in their activity complex ERP systems. The study shows that in general accountants are satisfied with the applications they use. They report on a biggest number of benefits than difficulties generated by the implementation and use of information technologies. In the same time, many respondents consider that the technologies can have future effects on their department. The efficiency of the systems used results also from the fact that Excel or similar software is used for less than 33% of the respondents' activities.

The correlation matrix proves that the use of information technologies impacts on the performance of the company. Also, it shows that our hypotheses were validated. Even though the model is not performant it represents a necessary start and in the same time an original construction, considering the diversity of variables and explanatory phenomenon or the typology of exogenous factors.

One of the limits of our research is represented by the small number of answers received. Yet, the number is representative for our country, where the respondents are cautious before participating in a research.

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