ERP and management accounting changes of industrial enterprises in Serbia*

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Summary: The application of ERP (Enterprise Resource Planning Systems) as the dominant global trend in the modern era of networked computing, in recent years makes its way to becoming more accepted in industrial enterprises in Serbia. Extremely powerful and radical shift in business from the implementation and application of ERP touches all aspects of business. However, the focus of this study is to assess the influence of SAP as ERP software in management accounting system of industrial enterprises. Hence, the objectives are the identification, evaluation and analysis of the impact of SAP on a management accounting system and management accountants of industrial enterprises in Serbia. In order to realize these goals in addition to considering the conceptual basis of ERP systems and review of previous research in this field, to identify and analyze the effect of SAP on the management accounting system and management accountants, ten enterprises of different industrial sectors of Serbia, that use SAP, a leading business ERP software, will be observed.

Key words: AIS, ERP, management accounting, management accountant.

Rezime: ERP sistemi kao dominantna svetska tendencija u modernoj eri umreženog računarstva, poslednjih godina pronalaze put i postaju sve prihvaćeniji i u industrijskim preduzećima Srbije. Izuzetno snažan i radikalan zaokret u poslovanju po osnovu implementacije i primene ERP-a, tangira sve aspekte poslovanja. Ipak, fokus ovog rada je sagledavanje uticaja SAP-a, kao ERP softvera, na upravljačko-računovodstveni sistem industrijskih preduzeća. Otuda, postavljeni ciljevi su identifikovanje, ocena i analiza uticaja SAP-a na upravljačko-računovodstveni sistem i upravljačke računovode industrijskih preduzeća Srbije. Kako bi se realizovali navedeni ciljevi pored razmatranja konceptualnih osnova ERP sistema i pregleda prethodnih istraživanja iz ove oblasti, za identifikovanje i analizu efekta SAP-a na upravljačko računovodstveni sistem i upravljačke računovode biće posmatrano deset preduzeća različitih industrijskih grana Srbije.

Ključne reči: RIS, ERP, upravljačko-računovodstveni sistem, upravljački računovoda.
1. INTRODUCTION

Management accounting of industrial enterprises should provide the answer to the challenges of constant changes and the answer to the requirements of enterprise management. This is possible only if management accounting undertakes continuous efforts to improve its information support to the enterprise management. Apart from general trends and approaches of improving management accounting system (divisional, strategic and competitive), the evolutionary path of management accounting was especially contributed by the development of information technologies, especially towards the ERP system. Due to the mentioned efforts, but also the external orientation, dynamic approach, team work and strategies coordination towards achieving the goals of enterprise, modern management accounting becomes able to create various information in order to meet various needs of numerous stakeholders. The focus of this research is the role of the ERP system in these processes. Having in mind the objectives set out by this paper, the attention will be focused to the essence and characteristics of this system and to the identification, assessment and analysis of its impacts on management accounting.

2. CONCEPTUAL BASIS OF ERP AS A CAUSE OF CHANGE

Information systems today should provide insight into the current status of all relevant parameters of the enterprise, contribute to defining the strategies in relation to the relevant network through which all the factors from the environment affect the enterprise (/12/). The client-server architecture is dominant form of information system, and its key software elements are network software and management database system. As service providers they provide, by their technical characteristics and performances, access and use of the data and information from network environment databases to the users (clients) (/7/). On the bases of client-software architecture, business information or integrated information system (ERP) was developed. However, the acronym ERP should not represent a dilemma in understanding the essence of integrated information systems, although it can point out to “planning” and “resources” and thus lead to wrong conclusions. The real focus and ambition of ERP is integration of all the departments and functions of enterprise into one information system, which can meet specific needs of various users.

ERP represents a highly integrated system based on the best business practice, which implies data archiving in a single base, by which the enterprise is provided with an efficient control of basic business functions, as well as the planning of strategic actions (/6/). As a result of extreme flexibility and adaptability, the rapid information flow, minimal response time to the requirements of buyers and
suppliers, better interactions with business partners, higher quality of provided services and increased satisfaction of clients are achieved. Decision-making at lower levels, as a result of reliable and timely informing and possibility of simulating the real business processes, leads to the reduction of costs and supplies, and flexibility in managing the transactions and shorter duration of production cycles provides higher efficiency and better performances of enterprise (/19/).

Having in mind that incentives for ERP implementation mostly come from the accounting (even more than 45%), and then from management (approximately 35%), the issue of its effects on organization and functioning of the overall AIS, and especially management accounting system, becomes logical (/21/). It is undeniable that this influence is multiple (/19/). For the purposes of identification and analysis of the ERP impact, particularly on cost accounting, management accounting and management accountants, conducted a number of empirical studies. The objectives, scopes and subject to the above studies were different, due to the presence of complexity and specificity of this relationship, which requires its summary.

3. BACKGROUND LITERATURE

All the studies, according to their character, can generally be classified into two groups, structural and procedural. Structural studies start from the basic assumption that the information systems (IS) are the cause of organizational changes in the enterprise. Concretization of that assumption in the domain of management accounting implies that ERP is based on modern information and communication technology, the factor of improving organizational performances (/2/, /22/, /10/). One of the studies tries to give the answer to the question if implementation of ERP has a positive or negative impact on the performances of enterprise (/15/). Study investigates 54 enterprises in a five-year period. It was concluded that there are no direct significant improvements of organizational performances immediately (three years) after ERP implementation. Also, there is no significant reduction in operating costs, except for the product cost in which case a decline was recorded. The existence of time gap between the moment of system implementation and achieving of the first positive effects was identified. Another study (/21/) examines 300 large industrial enterprises in Finland and effects of their transition from non-integrated software applications to ERP, as well as functioning and practice of management accounting in both system types. They concluded that there is no significant relation between ERP and the practice of management accounting, i.e. the ERP does not significantly encourage the implementation of innovative techniques in industrial enterprises.

Particularly interesting results were obtained by Hyvonen (Hivonen, 2003), whose research included precisely the large industrial enterprises in Finland, chosen in a controlled way from the list of 500 the largest, so that all the
industries are involved. Subject of analysis were the effects of transition from non-integrated software applications to ERP, as well as the consideration of functioning and practice of management accounting in both system types. Particular attention was dedicated to overall changes and problems in the domain of management accounting after ERP implementation. It was determined that out of the total number of respondents, 27% implemented the Activity Based Costing (ABC) as a modern system and technique of cost accounting and costs management. Out of that number, more than 65% has implemented ERP. Balanced Scorecard (BSC) was implemented by 24% of respondents (62% of them uses ERP). It is interesting that besides the modern ones, the traditional techniques and tools of management accounting are simultaneously being used. It is concluded that although it exists, there is no particularly significant impact of ERP on the practice of management accounting, i.e. ERP does not significantly encourage the implementation of innovative accounting techniques in industrial enterprises.

In the focus of studies based on the process approach, there are two key issues – acceptance and application of innovative accounting practice in organization and functioning of the accounting. The most important conclusions are that basic logic of accounting is not changing under the influence of ERP and that there are no dramatic changes in the accounting itself, but that, in most cases, there are changes in the work of accountants. Their job becomes more complex and role broader and more demanding, although some of the traditional accounting tasks are transferred to the other employees in the enterprise (/23/,/14/). One of the studies (/4/) evaluates impact of ERP on the management accounting performances to fulfill the management needs in the decision-making and control processes, as well as whether the new system influences the budgeting process and performances measurement. The sample consisted of the employees in the 10 large companies from Finland (users of SAP R/3). They concluded that ERP has a stabilizing effect on the management accounting, i.e. it does not lead to the adoption of new accounting techniques. Another study (/18/) was conducted on the example of Italian multinational company. The data were obtained by interviewing the accountants and other employees. Results indicate that ERP increases the level of routine tasks and thus there are more evolutionary than revolutionary changes in management accounting, so the changes are incremental. The case study (/3/) of one Italian company from Milan shows that accountants spend less time on reporting because these tasks are mostly automated after ERP implementation, which leaves more room form complex business analysis.

In the end, it can be concluded that the results of all these studies are not completely consistent. The way in which ERP will influence the management accounting system largely depends on how the system is defined and understood. Poor or inadequate understanding of ERP causes poor comprehension of its impact on accounting. There are also other reasons for fragmented results, for example high level of data aggregation, use of various research methods, research coverage, whether it is conducted on the level of divisions or enterprises etc. However, it needs to be pointed out once again that the characteristics of integrated applications, facilitate already initiated changes
in enterprises conditioned by their changes, but they also open new possibilities, especially in the domain of management accounting system. The observed changes are evolutionary, i.e. incremental, with minimal disruption of the existing policies and procedures, more focused on rebuilding, adaptation and modification of the existing system.

However, for a more detailed consideration of potentials and impacts of ERP on shaping the practice of cost accounting and management accounting, especially in the domain of changed tasks, application of new techniques and change of the operation manner of management accountants themselves, apart from the review of the results of empirical research, the peculiarities of ERP should firstly be pointed out and then it is necessary to attempt to develop a particular theoretical framework, which will serve for an additional, more comprehensive analysis.

4. THEORETICAL AND EMPIRICAL RESEARCH FRAMEWORK FOR SERBIAN INDUSTRIAL ENTERPRISES

Apart from already mentioned study (/21/) conducted on the example of industrial enterprises in Finland, there are not a large number of serious studies and analyses concerning this topic. Such a situation can be explained by a statement that the conclusions, made in relation to the impact of ERP to management accounting system, especially its tasks, techniques and organization, equally refer to all the enterprises, even industrial ones. However, having in mind that industrial enterprises today face the essential changes in their operating mode, then their specificities whose reflection is particularly obvious in the field of AIS and management accounting, as well as the requirements of industrial management, the attention should be focused on some specific aspects. Identification and analysis of ERP impact on management accounting of industrial enterprises are largely conditioned by organizational positioning and structuring of accounting function itself and its segments. The results of considering the relation between ERP and management accounting will largely depend on the organizational solutions, which should be conceived primarily in the interest of meeting information needs of numerous users, and especially industrial management. However, we should have in mind the broader dimension of ERP implementation and building of information platform for the level of enterprise, in which AIS module represents only one segment (/7/). The mentioned peculiarities of industrial enterprises additionally influence the construction of ERP platform as a whole, so it can be concluded that it is about a mutual, interactive relationship.
4.1 Research objectives and empirical method

Issues of the research are the changes that occur in management accounting under the influence of applying SAP as ERP software. The objective can be defined as the determination of the effect of SAP on management accounting system, i.e. the answer to the question whether there was an improvement of performances of the management accounting system after SAP implementation. The focus of research is the application of the new innovative accounting techniques, increasing the work efficiency and reduction of the time necessary for performing the tasks of management accountants, as well as the reconsideration of the possible revitalization of their role and significance. For this purpose will serve a model, i.e. theoretical framework developed by Rom and Rohde (/17/) and which is applied by Yu Ho Tin (/5/). With respecting the possibility of existance and different approach to observing the relation between SAP and management accounting system, and based on the research of the relevant literature, the Fig. 1 shows this framework for the analysis (framework suits not only the industrial, but the other types of enterprises as well).

Figure 1. Theoretical framework for investigating the relationship between SAP and management accounting (/17/, pp. 45)

This model will be partially modified in order to meet the specifics of the concrete research. Modification of the model includes the research only of the following relevant areas, namely: the relation between SAP and tasks and techniques of management accounting, changed roles of management accountants and the organization and functioning of AIS and management accounting system. Bearing in mind the abovementioned, three basic research hypotheses are identified.

Hypothesis 1: After the SAP implementation there are changes in the organization of management accounting and SAP contributes to the introduction of new advanced management accounting techniques.

The advanced techniques of management accounting or key variables include the ABC, BSC, Benchmarking, Customer Satisfaction Surveys, Financial Key Performance indicators, Non-financial key performance indicators, Target Costing (TC) and Lifecycle costing. Numerous researchers have identified only minimal effects of SAP on the practice of management accounting in terms of introducing new and innovative management accounting techniques (/1/, /4/, /18/).

Hypothesis 2: After the implementation of SAP there is the change in the role of management accountants and their tasks.

In the function of testing Hypothesis 2 the following skills for management accountants will be observed, including: reporting skills, knowledge of information systems, teamwork and possessing interfunctional knowledge. Through the estimation of the importance of these skills, before and after the implementation of SAP, it will be concluded whether the change in the role of management accountants occurred. In terms of the tasks budgeting, reporting, data analysis, cost accounting and performance measurement will be analyzed in a way to examine the time needed for these activities before and after the implementation of SAP. This will give assessment of the changes in the tasks of management accountants. In this regard, some authors (/4/, /18/) emphasise that SAP provides more time for sophisticated analyses and the changes in the processes of budgeting and planning after the implementation of SAP were identified as minimal, while other (/18/) suggest more expressed role of management accountants as analysts and the reduction of time necessary for routine accounting tasks.

In methodological sense, the interviewing includes large industrial enterprises in Serbia which use SAP. SAP is certainly a significant innovation because it could strengthen the competitiveness of Serbian industry by defining new industrial policy and new objectives in terms of EU accession (/11/). It is about leading business software, which is used by more than 105.000 different economic entities in 120 countries of the world. Additionally, it needs to be pointed out that the users of SAP in Serbia contribute with more than 1/3 to the gross domestic product of the country (/24/). Since the most common software in Serbian market is SAP only those industrial enterprises that are the SAP users were interviewed, as in the case of (/21/). In addition, the enterprises in various industries were considered due to the equal presence of all industries, precisely, those were the enterprises of pharmaceutical industry, oil industry, industry of beer, food, metal, chemical and light manufacturing industry. During the formation of the sample, the attention was paid on the length of period of SAP use. The sample included the enterprises that have used SAP for 5 months only, but also the enterprises that have used SAP for two, three, four, five and six years. In above-mentioned enterprises, the accounting, finance, plan and analysis, i.e. controlling managers were involved. The survey was conducted by direct surveys, e-mail or telephone.

In the realization of the research there was a lot of difficulty, since there were no similar studies in our country. The authors are aware of all possible limiting factors. Disputing may be small sample size, which consists of 10 large
industrial companies, users of SAP. However, according to SAP's size criteria only four Serbian companies would meet the criteria of a large company. Hence, for the sake of greater reliability of results, we used firm size criteria defined by the applicable regulations of Serbia. Small and medium enterprises were not taken into consideration, which is compatible with similar research studies in the world. Specifically, the assumption is that in the case of small and medium enterprises, the very size of the enterprise may be a limiting factor in implementing SAP. Additionally, in striving to increase the reliability of the results, enterprises of different industry and with different length of using SAP are selected. Also, the survey included only companies of Serbia, which can also be noted as a potential limitation. However, during the entire work and in presenting the conclusions, we were guided by a similar research in the world and accordingly we did some comparisons. Despite all this, the authors are confident in the reliability of the results obtained, particularly because the obtained conclusions largely coincide with the findings of similar surveys carried out in the world.

4.2 Empirical Results

For the purposes of describing the sample basic descriptive statistical measures are used. Analysis shows that, based on the sample of 10 enterprises, range of time of using SAP in months is 72 months, the minimum score is 21 months and maximum is 93 months. The mean is 52.40 months. Standard deviation as the most precise measure of the variability of occurrence is 22.65 while the most frequent time of use is 57.50 months. Fig. 2 shows the surveyed companies according to the length of using SAP.

![Figure 2. Surveyed companies according to the length of using SAP](source: result of own analysis)
Bearing in mind the presented theoretical model, established goals and hypotheses, the following relevant issues should be considered: the relationship between SAP and the tasks and techniques of management accounting, changed role of management accountants and in general the organization and functioning of AIS and management accounting system.

4.2.1 The relation between SAP and management accounting techniques

In this section will be analyzed two management accounting techniques ABC and BSC. Although available and useful, they are not widespread due to the numerous barriers (/17/). With the emergence of the advanced IS, especially ABC and BSC softwares, it is expected that their application will be increased.

Although the ABC is not unknown to the enterprises, the survey shows that before the implementation of SAP in four companies in Serbia ABC was implemented. Results obtained for the period after SAP implementation, shows that 6 of 10 respondents use some form of ABC (Fig. 3). The usage of ABC was identified only in two companies after the implementation of SAP. Specificity reflects in that the ABC is not entirely implemented and that it is used almost in all cases as an additional system of cost accounting and cost management, i.e as a system complementary to the existing one. The application of TC is recorded in 40% of industrial enterprises included in the survey, and BSC in 20% of cases. It is significant the use of financial key performance indicators in about 30% of the surveyed companies after the implementation of SAP. In more than 20% of cases, there was no implementation of new innovative techniques and tools of management accounting.

(source:result of own analysis)

Figure 3. The application of management accounting techniques before and after SAP
Can be concluded that principles and techniques of management accounting system have not been drastically changed under the influence of SAP. However, having in mind the survey data, SAP represents an important source of support to the new accounting practice, i.e. it provides the initiative to the implementation of some new accounting techniques, primarily ABC, TC and BSC, which were not so widespread before the SAP. It is realistic to expect that in the future the SAP will influence the advent of the new ones and support the changes in the existing techniques of management accounting system.

### 4.2.2 The relation between SAP and the task of management accounting system

Analysis in this section requires the decomposition of management accounting system into segments of transaction processing, reporting and support to decision-making. In relevant literature, it is claimed that SAP performs the tasks more successfully in the domain of transaction processing and producing operational information. In contrast, it is pointed out that there is much lower level of SAP efficiency in the support to reporting and decision-making, i.e. that its information support for the needs of decision-making is limited. Without any doubt in the high level of operational efficiency of SAP, in order to make sure that the attitudes in the domain of informing do not create a confusion, since the first association to the SAP is „more and better information“, its reporting ranges need further analysis (/1/). The potential dilemma can only be resolved by the analysis of details and aggregation of information, determination of the management levels towards which they are directed, as well as which is their purpose. Exceptional orientation on operational activities and operational management, as well as the high level of details of numerous information, indeed make the SAP information support inadequate for the needs of strategic business decision-making (the survey results). This is evidenced by the example of production module, i.e. cost accounting, which confirms the statement on the high efficiency of SAP in the domain of processing and reporting for operational purposes (/20/). Operational activities of this module are very efficiently implemented by SAP, providing the high quality of processing, much better and flexible information, as well as more accurate and coherent financial flows. The reports produced from such a system, with a large scope of extremely detailed information, are the most useful for operational management. The information produced in this way are generally similar to the information produced by previous systems, but in SAP environment, they are more available, with the possibility of the management to access them directly, without waiting for their shaping into various reports. SAP is highly effective in the field of processing and reporting for operational purposes. The question of informational support for the needs of middle and top management remains open.

The fact is that SAP improves and standardizes information flows, but at the same time it centralizes them. Although it is very successful in the domain of transaction processing and efficient in the creation of numerous financial, manufacturing, statistical and management information, it does not provide all the necessary information for a long-term and strategic decision-making. Hence,
can the SAP really meet these needs in an adequate way? The answer is affirmative, but conditional as well. Yes, only with the support of management accountants, who remain irreplaceable for the needs of support to this decision-making. Management accountants prepare the necessary information and reports by their extraction from the system and analysis, since the quality of the report of SAP in the real time is not sufficient for the needs of middle and top management.

The proof is an example of the budgeting process, as one of the tasks of management accounting. Instead of being statistical or fixed plan for the entire enterprise for the whole year, the budget becomes dynamic and flexible, i.e. it can easily be revised, modified or changed during the time. In addition, it is possible to make good predictions on a monthly basis, so that the comparison with the achievements can be made on monthly basis. Hence, the reports of management accountants for the needs of management are less focused on comparison with the budget and more on the comparison with predictions. Although it is more extensive, this task of management accountants requires less time after SAP implementation, as evidenced by the Fig. 4.

![Figure 4. Time required for the tasks of management accounting before and after the implementation of SAP](source: result of own analysis)

**TABLE 1** presents descriptive statistics for the variables types of tasks for management accountants, and the time required for the realization of these tasks before and after the implementation of SAP.
Table 1. Descriptive statistics for the variables types of tasks for management accountants

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>σ</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time for budgeting before SAP</td>
<td>10</td>
<td>13.60</td>
<td>9.901</td>
<td>0</td>
<td>30</td>
<td>12.50</td>
</tr>
<tr>
<td>Time for reporting before SAP</td>
<td>10</td>
<td>28.50</td>
<td>11.316</td>
<td>10</td>
<td>40</td>
<td>32.50</td>
</tr>
<tr>
<td>Time for analysis before SAP</td>
<td>10</td>
<td>14.40</td>
<td>5.100</td>
<td>4</td>
<td>20</td>
<td>15.00</td>
</tr>
<tr>
<td>Time for cost accounting before SAP</td>
<td>10</td>
<td>23.00</td>
<td>9.775</td>
<td>10</td>
<td>40</td>
<td>22.50</td>
</tr>
<tr>
<td>Time for performance measurement before SAP</td>
<td>10</td>
<td>16.00</td>
<td>8.756</td>
<td>5</td>
<td>30</td>
<td>15.00</td>
</tr>
<tr>
<td>Time for budgeting after SAP</td>
<td>10</td>
<td>8.80</td>
<td>6.321</td>
<td>0</td>
<td>20</td>
<td>7.50</td>
</tr>
<tr>
<td>Time for reporting after SAP</td>
<td>10</td>
<td>21.40</td>
<td>13.525</td>
<td>5</td>
<td>49</td>
<td>22.50</td>
</tr>
<tr>
<td>Time for analysis after SAP</td>
<td>10</td>
<td>30.00</td>
<td>8.185</td>
<td>20</td>
<td>50</td>
<td>30.00</td>
</tr>
<tr>
<td>Time for cost accounting after SAP</td>
<td>10</td>
<td>15.20</td>
<td>6.443</td>
<td>10</td>
<td>30</td>
<td>15.00</td>
</tr>
<tr>
<td>Time for performance measurement after SAP</td>
<td>10</td>
<td>21.50</td>
<td>8.835</td>
<td>5</td>
<td>35</td>
<td>22.50</td>
</tr>
</tbody>
</table>

(source: own calculation)

The average time for budgeting expressed in percent before the implementation is 13.60% and after the implementation of SAP is 8.80%. In 7 cases time for budgeting after the implementation of SAP is less than the required time before implementation (Negative Differences), in only one case, the time required for budgeting is greater after the implementation (Positive Differences) and in 2 cases there was no change in the time required for budgeting (Ties). Since the $p = 0.070$ we can conclude that the time needed for budgeting is significantly shorter after the implementation of SAP (Nonparametric Test/2 Related Samples). Similarly, given that $p = 0.109$ for reporting, it is concluded that the time required for the activities of reporting is significantly reduced after the implementation of SAP. However, we must not neglect the fact that the respondents made a significant difference between the operational and strategic reporting. In this sense, time required for operational reporting is shorter, and for the needs of strategic reporting is longer, which is consistent with the specifics of SAP. Furthermore, $p = 0.002$ for the task of data analysis indicates a significant increase in time required for these jobs after the implementation of SAP, as well as with the performance measurement ($p = 0.070$). In terms of activities of cost accounting, there was recorded a significant reduction of required time after the implementation ($p = 0.039$).

As an answer to the second hypothesis, it can be concluded that it is obvious that after the implementation of SAP, the time necessary for budgeting and cost accounting is reduced, but simultaneously the requirements in the domain of analysis, additional more subtle informing of middle and top management and performance measurement are increased. SAP directly provides a lot of
information for the needs of operational decision-making, but for the needs of medium-term and long-term decision-making, it is necessary to use additional tools for the creation of information (the survey results are largely consistent with the results obtained by Yu Ho Tin 2006. ([5]). The role of Excel is enormous, as well as the role of tools for business intelligence (BI). Strengthening the information sources is contributed by the applications for connecting the companies with strategic partners, known as the applications for partner relationship management (PRM), by which better communication with business partners is provided, especially in the creation of information in the real time.

### 4.2.3 Changing the role and satisfaction level of management accountants under the influence of SAP

Today, having in mind the decentralization of accounting knowledge, and primarily due to the SAP, the tasks of management accounting are mostly done by the managers at all levels. Traditionally, management accountants are the carriers of all the tasks from the domain of management accounting system. Management accountants, apart from the traditional, also perform the tasks from the domain of general management and tasks of the maintenance of IS. Conducted research was focused on four basic types of knowledge (abilities, skills) of management accountants, and those are the following: understanding the financial and management accounting, possessing the knowledge from other functional fields (manufacturing, sale and marketing), knowing and using information systems and the necessity of team work. The survey found that the implementation of SAP sets higher requirements for each type of knowledge, i.e. skills (abilities) mentioned, which shows TABLE 2.

<table>
<thead>
<tr>
<th></th>
<th>Mean Before SAP</th>
<th>Mean After SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>The importance of knowing IS</td>
<td>2.40</td>
<td>2.20</td>
</tr>
<tr>
<td>The importance of having functional knowledge</td>
<td>2.40</td>
<td>2.80</td>
</tr>
<tr>
<td>The importance of team work</td>
<td>3.30</td>
<td>3.60</td>
</tr>
<tr>
<td>The importance of reporting skill</td>
<td>3.80</td>
<td>3.90</td>
</tr>
</tbody>
</table>

(source: own calculation)

It is not surprising that possessing basic knowledge from the domain of management and financial accounting still occupies the leading position. The knowledge from various functional fields becomes more significant, in accordance with the mentioned requirements for possessing interfunctional and multidisciplinary knowledge. The results on the necessary decentralization of accounting knowledge towards operational managers, primarily the managers of production functional area, are particularly interesting. Namely, the specificity of
SAP as an ERP software is entering the data only once, which makes the entry itself more demanding, complex and responsible. In that sense, the role of the manager of production functional area is particularly increasing, having in mind the scope and significance of entered information for which they are directly responsible. The increasing of significance and necessity of teamwork is logical with the previous. Although increased, the requirements for the possession of IT knowledge of management accountants are at the lowest level. Namely, in more than 60% of the interviewed enterprises, it was pointed out that the employed already possessed the sufficient level of IT knowledge, so the transition to SAP did not require any additional training of this type. Learning about strictly defined authorizations, which prevents the conflicts in the aspect of authorizations and responsibilities, represented a necessary and indispensable part of the training. Of course, it was necessary to get to know the peculiarities of this software package and its procedures. Basic IT skills are not a problem.

In connection with the examination of changes in the importance of the aforementioned skills, the following probabilities are identified: \( p_1=0.72 \), \( p_2=0.68 \), \( p_3=0.45 \) and \( p_4=0.72 \) (based on Nonparametric Test/2 Related Samples), and for all the four cases there can not be identified statistical significant changes after the implementation of SAP. It is obvious that on average the greatest importance after the implementation of SAP has the skills of reporting, also on average the importance of all these skills is increasing but the skill of knowing and using IS. But all these are not statistical significant.

The trend of increasing the responsibility of management for financial aspects of activity influences a partial reduction of the responsibilities of management accountants. Owing to the computer technology, which integrates managing systems with the systems of operational control, management has on line access to all the information, especially those necessary for controlling the costs. That is, the jobs that were previously done by, for e.g., accountants, they are now done by the system (Cooper and Kaplan 1998.). It is about a positive change in business, but from the standpoint of management accountant, the loss of simple and basic skill is possible, i.e. their transformation into mere analysts of the system. This is evidenced by the answers of the respondents as well. Namely, more than 50% of the respondents pointed out: „the accountants turn into operators and supervisors“.

We should not draw a wrong conclusion that the role and significance of management accountants is reduced, although they are not engaged in simple measuring and reporting on performances anymore. Management accountant still remains irreplaceable in the jobs of interpreting various indicators of performances and analysing their mutual relations. In addition, it is expected from them to be internal consultants, who will not only assist the managers in the creation of strategies and decision-making, but also actively participate in those processes through integral approach to the analysis and understanding operational performances and financial indicators. Providing such a support is possible only on the basis of possession of the new skills and knowledge, more precisely, the consulting, communication and interpersonal skills, broader knowing of the entire business, adopting new way of thinking and behaving and
development of new business culture in accordance with the requirements of changes (/16/). Retaining the role of the creator, consultant, supervisor and analyst of the cost accounting and management accounting, AIS and IS of enterprises, management accountants become irreplaceable managers at all levels of management, with the actual ability to support the management of a modern enterprise and to actively participate in corporative management.

4.2.4 Changes in organization and functioning of AIS and management accounting system

Development of AIS has going upwards in the direction of a continuous improvement of the quality of their information content, in the field of financial, as well as in the domain of management accounting, as its basic segments. It appears that in the field of financial accounting, the issue of reaching and maintaining the necessary level of financial reporting is in the first place, and then the control of reporting quality. In the domain of management accounting, as traditionally the most reliable information support of the management and cost accounting as its essential part (/20/), the issue of adequate, high-quality information support to the management in effective management of the mission, objectives, strategies and performances, and especially overall competitiveness of the enterprise, is of crucial importance. Both segments of AIS are significantly influenced by IS and IT (/6/).

Owing to the IS, a large part of routine accounting tasks is done centrally and automatically, while the coordination and preparation of various operational reports is trusted to the ERP. In addition, on the basis of advanced technology, the so-called centers of excellence arise, i.e. the teams of specialists who perform more demanding tasks, such as statutory (financial) and tax reporting, but also the internal audit (/15/). The information generated by the specialists and computer system become easily accessible and they are rapidly shared at all the levels of organizational hierarchy of the enterprise. The availability of accounting information has lead to another systemic change in accounting, i.e. to the already mentioned decentralization of accounting knowledge towards management structures. The progress, due to the sharing of knowledge and information, as the only resource which is increased by dividing, has been made only in the direction of more efficient and better decision-making of the management.

The application of IS, especially those based on client-server architecture, in modern era of networked computing has contributed to numerous changes in accounting information and management accounting system. The most significant are:

• Elimination of routine tasks of the accountants, since the tasks that were once performed by officer for costs and other accountants are now performed by the computers. Although it can imply the loss of some basic, traditional accounting skills, the requirements that are set before the accountatnts are not of the reduced scope and
complexity. On the contrary, they are aimed at much serious tasks of analyzing and reporting.

- Operational management possesses a lot more accounting knowledge, which confirms the necessary decentralization of that knowledge. Additionally, the management is responsible for the financial aspects of its own activities, especially the development and control of the budget, prediction and analysis of deviations. The responsibility of the manager of production functional area becomes particularly important.

- Necessary information is much more oriented towards the future, which determines the focus of accounting. Another example is the budget. Namely, instead of representing static and fixed plans for the entire next year, the budgets become more dynamic and flexible, because they can be corrected, modified and changed over the year, through the processes of the current prediction.

Additionally, the contemporary aspect of AIS, as it is observed, implies the changes of a few relevant moments, especially strategic approaches and concepts of management by objectives. Significant presence of IT, then new altered roles of accounting and managerial profession with new specific, increased respect for the international professional regulations, code of professional ethics are the fields of big changes with a direct impact on the accounting, AIS and accounting profession (/9/). Strongly expressed dynamics of these changes sets the requirements for a more uniform and quality accounting report, especially having in mind the unbreakable connection between such a reporting and efficient management.

5. CONCLUSIONS

The conducted theoretical analysis, supported by the results of empirical research, indicates that there is the impact of SAP on the management accounting system. The reason for this should be looked for in the peculiarities of SAP itself, as integrated software.

1. The process of the implementation of SAP is very complex, which can threaten and slow advanced development of accounting. The reason for this is that in its initial phases, more attention is devoted to configuring the basic modules. Effects of SAP implementation delayed due to the long-term implementation. This is corroborated by the fact that there is a time gap identified between the moment of the implementation of the system and the first positive effects. In one of the enterprises included in the survey, the implementation process itself has lasted for more than 18 months, it is still not ended and both SAP and the old software solution are simultaneously used. Enterprises that are in the early
stages of use have more objections to the operation of the software (the attitude of one of the interviewed managers is that abbreviation SAP means „Slowly And Painfully“). Having in mind all the above-mentioned, it is logically to expect that the enormous potential of SAP will be more completely used in the later phases of functioning, with the maturing of the idea of its significance and effects.

2. In addition to the long life of the project, extremely high financial requirements and system’s complexity, the reason for the limited impact of ERP should also be looked for in the area of failures and errors in its implementation. Most frequently, it is the wrong choice of implementation strategy, choosing the wrong ERP, selection of bad consultants, delays in business operations and decrease in business performances, in the period immediately after the implementation, due to the reengineering of business processes etc. in one of the respondent enterprises, the comment of the finance manager was “good consultants can save you, but they can destroy you, as well”.

3. The replacement of the existing system by the new one causes a larger number of problems, such as: information transfer from a several different existing applications to the new system for the purpose of integration, complex technical and operational, but also the social questions, especially the organizational resistance to the changes and specificities of corporative culture. Orientation of the system towards the whole of the business, and not the individual functions, can cause rigidity as well. This is supported by the attitude of one of the interviewed managers “too much specialization and the lack of flexibility”.

It is observed that specific age and qualification structure of the employees also determine the level of satisfaction and attitude on the usefulness of SAP. Dominant presence of the older workers of the lower educational level complicates the implementation of SAP, but also the implementation of the advanced accounting techniques. In overcoming that resistance, the role of the accounting manager should be essential, and for that, his level of education sufficiently high and broad and constant learning included. In order for SAP to come to life and acquire all its positive sides, some kind of constant agitation and promotion in the enterprise is necessary, i.e. the spreading of the idea and positive attitude towards the novelty. The survey has shown that the enterprises with foreign capital, managers and consultants are leading in this.

Finally, it can be concluded that there is no strong causal relationship between the implementation of SAP and changes in practice of management accounting, i.e. the stabilizing effect on management accounting is more widespread. However, the most significant changes need to be emphasized. Firstly, the change in the structure of time required for the realization of various tasks of management accounting, in the direction of reducing the time required for the traditional tasks and increase of the time required for the needs of analysis, performance measurement and reporting. The time necessary for a more subtle managerial reporting is particularly extended. Numerous information cannot be
obtained directly from SAP, so it is necessary to use Excel, BI or other tools, which additionally increases the significance of management accountants. Secondly, after the implementation of SAP, in majority of the respondent enterprises, the application of various advanced techniques and tools becomes possible, especially ABC in the form of integrated module. Thirdly, the changes in the domain of the operating mode of management accountants themselves are certainly the most extensive, particularly due to the possibility of building the integrated cost system. The surveys have shown that the role of accountants in the domain of controlling the performed operations becomes stronger, while the time required for routine tasks is reduced. And fourthly, all the above-mentioned specificities have also conditioned the change in the method of organizing and functioning of the entire AIS, including the management accounting, pointing out the significance of teamwork and necessary decentralization of accounting knowledge. The future of management accounting cannot be predicted with certainty, but it is certain that the future will be characterized by the change in reporting system, conditioned by the emergence and implementation of ERP.

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