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IMPLEMENTATION OF AN ERP PACKAGE AND ITS EFFECT ON THE MANAGEMENT ACCOUNTING SYSTEM – AUTHOR’S OWN RESEARCH INTO ENTERPRISES IN POLAND

Ewelina Zarzycka¹

Abstract

The systems have revolutionized practically all aspects of business processes in enterprises. They improve the processes by ensuring their integration. Data are entered into an ERP system only once and immediately afterwards they can be accessed through any of its modules, which makes them a valuable source of information on the enterprise. Integrating the financial and non-financial data, an ERP package gives new quality to the management of enterprise value. These features make ERPs particularly useful for management accounting processes and for specialists providing management information.

This article seeks to answer whether following the implementation of an ERP package the enterprise’s management accounting system becomes more innovative and whether new, modern management accounting tools and methods are introduced. The ERP impacts on management accounting and its practices will be evaluated using six case studies involving enterprises owned by multinational corporations.

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Introduction

The characteristics of the new economic reality include accelerating dynamics of changes that shortens product life cycles and hypercompetition that makes enterprises adopt competitive strategies emphasising customers, quality, time and product prices (Szychta, 2007). As today’s priority is to ensure that customers’ orders are fulfilled quickly and on a timely basis, efficient, flawless and fast production processes are increasingly in demand. Managers struggling with fierce competition in the global markets have realised that they lack information systems capable of producing well-timed information, which they could use to plan, control, make decisions, and manage multinational corporations. A response to these needs is integrated information systems known as Enterprise Resource Planning (ERP) systems.

The systems have revolutionized practically all aspects of business processes in enterprises. They improve the processes by ensuring their integration. Data are entered into an ERP system only once and immediately afterwards they can be accessed through any of its modules, which makes them a valuable source of information on the enterprise. Integrating the financial and non-financial data, an ERP package gives new quality to the management of enterprise value.

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These features make ERPs particularly useful for management accounting processes and for specialists providing management information.

This article seeks to answer whether following the implementation of an ERP package the enterprise's management accounting system becomes more innovative and whether new, modern management accounting tools and methods are introduced. The ERP impacts on management accounting and its practices will be evaluated using six case studies involving enterprises owned by multinational corporations. The research being presented is consistent with other studies on ERP effects on management accounting and confirms the earlier findings.

The nature of ERP systems

The management accounting systems that enterprises use today will be greatly determined by the new possibilities offered by computer technology. The enormous progress in computer science that we have witnessed in recent years has provided financial controllers with a range of new tools that can improve their performance in various ways. Today's advanced computer technologies make available efficient hardware platforms, and new inventions bring hardware prices down, so even the small and medium-sized enterprises may afford high-tech computer systems.

Integrated information systems use the minimal set of data that is available to generate all pieces of information that may be needed for decision-making and reporting purposes. This feature of ERP packages allows an enterprise to shut down all independently running and overlapping systems for data collection and processing. The most effective among these solutions are the distributed open information technology systems using client/server topology, which give managers access to each unit's data as soon as they are entered, as well as enabling all enterprise personnel to exchange and distribute information – this feature has become characteristic of the turn-of-the-century information technologies (Granlund and Malmi, 2002).

In addition to being multi-modular structures, the integrated management systems are also special in that all data are entered only once and immediately afterwards they become accessible through all system modules. Their other features include functional comprehensiveness, the ability to integrate data and processes, customization, ease of configuration and compatibility, with local laws (Shang and Seddon, 2002).

The integrated management systems started to evolve in the 1960s, the process resulting in successive standards. The standard called Enterprise Resource Planning or MRP III (Money Resource Planning) was created in the 1990s. Its main purpose is to ensure a possibly high degree of integration between all levels of management. An ERP package covers all production and distribution processes in the enterprise, integrates various business areas, streamlines the flows of critical information and enables instant responses to changes in the market. The ERP data are updated on an on-going basis and can be accessed any time they are needed (Spathis and Constantinides, 2004, p. 235).

The integrated information systems known as ERPs have revolutionised the way enterprises do their business. They are readily implementable sets of integrated modules that can handle all business functions in the enterprise (Kavanagh, 2001). They are also dynamically customizable, which means that they can be adapted to address the needs of any industry. ERPs can build comprehensive models of business processes, which places the systems among all-embracing solutions containing large numbers of modules of different complexity (Scapens and Jazayer, 2003, p. 202).

ERP packages contain the elements of organizational integration because of their different approach to information as the organization's main resource. While other IT solutions, which are

still used, treat information only as a basis for preparing reports and statements, the ERPs assume that information is an inexhaustible resource that can fully meet enterprise's operational needs. Besides, the ERP-generated data can be used multiple times and can be shared among different modules, which saves additional, often superfluous data processing.

Enterprise mergers and acquisitions that are frequent these days make it necessary for managers to direct, plan and manage very dissimilar conglomerates in a clear and transparent manner. Unlike many earlier IT solutions that primarily ran on the mainframe computers, the ERP systems are useful also for multinationals operating in different industries and having branches in remote locations, because all multinationals, although structurally different, tend to standardise their operations. The comprehensive integration offered by ERP packages helps enterprises solve most problems with keeping data exchange standards and interfaces, with monitoring the management costs of IT projects and of personnel training, etc.

Notwithstanding all their advantages, ERP systems are increasingly criticised for being likely to deteriorate the quality of management and decision making in enterprises, because of the possibility of flaws in some of the real-time data (Cooper and Kaplan, 1998).

A review of the literature discussing ERP impacts on management accounting

ERP developers compete with one another in showing the benefits of their products. For instance, SAP AG assures that its package allows the buyer to realize financial profits soon after its implementation. Oracle advertises its products as providing the users with information that is both reliable and essential for making decisions and for operational improvements, thus capable of reducing their costs (Oracle, 2011; SAP AG, 2011). The websites of the leading ERP developers present a wealth of case studies on enterprises that have successfully implemented their packages. The reasons why enterprises choose to purchase ERP systems range from the need to have a single system for handling all business processes and the necessary support for a new business model, to a wish to solve some logistics or materials management problems, etc. (Granlund and Malmi, 2002).

However, the research dealing with ERP impacts on enterprise management and with the systems' financial benefits has a relatively short history, as the first studies from this field were published only in the early 21st century. Particularly interesting among them are those that attempted to find out whether ERPs really help improve enterprise' financial condition. The hypothesis that it is so is based on the assumption that because an ERP changes an organization its better performance can be expected.

R. Poston and S. Grabski (2001) studied 50 US enterprises for the behaviour of 4 financial variables before and after ERP systems were introduced. Their findings are not quite clear, because they found the number of employees to sales to decrease within the 3 years after the implementation and the cost of goods to sales ratio not to drop until the third year. The selling, administrative and general costs to sales ratio and residual income failed to show major changes following the implementation of the system.

J. E. Hunton (2003) et al. sought to determine how an ERP implementation influenced the general condition of an enterprise. They compared the rates of return from assets, the rates of return from investments and total asset turnover in ERP users and non-users. The first group was not found to be significantly better off. However, in the period in question the analysed ratios did not deteriorate in the first group, unlike those among ERP non-users.

A. I. Nicolaou et al. (2003) also compared financial data on ERP users and non-users. The authors showed that in the second year following ERP implementation the first group had much better financial results.

Z. P. Matolcsy et al. (2005) concentrated on ERP benefits in three business areas: internal logistics, operations and marketing/sales/distribution. Their study of 35 Australian enterprises demonstrated that ERP improved the inventory turnover ratio and the assets turnover ratio, as well as the management of liabilities.

Most available studies do not clearly indicate whether ERPs actually improve, or not, the financial condition of enterprises. This relationship is extremely difficult to capture and analyse. In many cases a detailed examination of the firm's situation and its surroundings is necessary, rather than a comparison of several ratios derived from its financial statements².

How ERP affects the accounting area in an enterprise, particularly its management accounting, has been studied relatively infrequently. The main advantage of an ERP system – the accessibility of a wide range of newly entered data from any place or geographical location – gives a new value to the work of a financial controller or a management accountant. This feature brings controllers closer to their area of responsibility. It is particularly important for multinational corporations, where the management accounting specialists are frequently required to service remote branches (Quattrone and Hopper, 2001).

A very interesting study was undertaken by P. Quattrone and T. Hopper (2005), who thoroughly analysed and compared SAP R/3 systems in two multinational corporations. The authors' main goal was to establish how the systems affected the exchange of information between the branches and the headquarters, as well as the management accounting and internal control solutions. In the first corporation the ERP system consolidated the existing internal control methods – the relations between the functional, operational and hierarchical areas remained intact. The implementation was planned to reflect the organizational, geographical and functional structures without making modifications to the control methods and tools. The system did not improve management control in the corporation. The other organization was a multinational US-based corporation that implemented SAP R/3 while carrying out a major reorganization of the existing processes and structures. The changes failed to bring the expected benefits and the managers pointed to much lower quality of the management control system. In their opinion, the system was not complete and worked effectively only at some points of time.

Booth et al. (2000) reviewed the experiences of Australian enterprises implementing ERPs to determine the systems' benefits to broadly understood accounting. According to the enterprises, the ERP systems proved useful in processing transactional data and as a source of information necessary to make the short-term decisions. At the same time, though, their capability of supporting more advanced strategic decisions was very limited. Besides, they did not induce changes in accounting practices.

C. Spathis and S. Constantinides (2004) surveyed Greek enterprises to find out why they chose to implement ERP systems and what accounting practices were used in the new environment. The findings showed that more than half of the enterprises used ERPs to calculate the financial and non-financial indicators of performance, to carry out multidimensional analyses of profitability, to plan and control their budgets, and to manage cash. Only few added operational management, activity-based costing, target costing or marginal costing to this list.

One of the most interesting studies dealing with ERPs impacts on management accounting and management accounting specialists was conducted by M. Granlund and T. Malmi (2002). It showed that ERPs only moderately affected control and management accounting systems. The sampled enterprises did not implement new management accounting solutions, preferring to

² For other studies on ERP effects see, for instance, B. Wieder et al. (2006), S. Beretta (2002).

improve the methods and tools they already used. Moreover, their more advanced management accounting tools functioned outside the ERPs.

Analysing the SAP implementation in BM (Europe), a branch of the global BM corporation, R. W. Scapens and M. Jazayer (2003) also found that although SAP did not induce the changes taking place in the corporate management accounting system, it made their introduction much easier. As reported by the authors, the changes were made because of corporate management being refocused to stress business processes and the measurement of performance.

Case study

This study concentrates on determining how an ERP implementation affects the management accounting area in an enterprise. Another objective is to find out whether the implementation entails innovative management accounting techniques and methods. ERP characteristics and functions encourage the conclusion that it is so. The integration of business data, the online availability of their most recent versions and practically unlimited possibilities of processing them remove some obstacles impeding the implementation of new management accounting techniques (e.g. activity-based costing or more advanced budgeting processes). An ERP implementation frequently involves the reorganization of business processes or structures, or induces other major changes in enterprise management that must be reflected in the accounting system. An ERP project is a good opportunity for reviewing the management accounting solutions, particularly those concerning cost accounting, budgeting or the evaluation of performance. An ERP system allows automating some cumbersome analyses and procedures, giving the controllers more time to implement new management accounting practices and techniques. The available studies show, however, that ERPs only moderately affect the shape of management accounting. The following research hypothesis is formulated:

HYPOTHESIS: The implementation of an ERP system entails the introduction of new, innovative solutions concerning management accounting.

In order to determine ERPs' effects on enterprises' management accounting systems the case study approach was adopted. R. K. Yin (1994) defines this approach as an empirical investigation that allows examining a transient phenomenon in its real environment. It is particularly useful when the relationships between a phenomenon and its circumstances are not clear. Although the approach does not justify deriving generalizations from the findings, it seems to be the most suitable tool for explaining the questions raised in this study. A questionnaire survey of financial controllers and financial directors from enterprises that have implemented their ERPs over the last two years was initially considered, but this technique was abandoned for being unable to clarify all issues and for being likely to result in the misrepresentation or omission of ERP-induced changes in management accounting because of the relative simplicity of the questionnaires.

In exploring the management accounting area a case study-based research method is frequently employed. The list of authors who have used it to analyse ERPs and the relationships between them and management accounting, financial accounting and internal control systems includes, *inter alia*, M. Granlund and T. Malmi (2002), S. C. Lodh and M. Gaffikin (2003), R. W. Scapens and M. Jazayeri (2003), A. Caglio (2003), as well as P. Quattrone and T. Hopper (2005). According to M. Granlund and T. Malmi (2002), the method offers more possibilities of explaining the occurring phenomena than a questionnaire survey, and does not suggest any answers to the respondents. R. W. Scapens and M. Jazayer (2003) also recommend a case-study analysis as a tool providing a better insight into management accounting changes following from the implementation of ERP systems.

Between 2010 and 2011 a total of nine interviews were conducted with the representatives of six Poland-based manufacturers owned by multinational corporations. The interviews involved 2 financial directors, 3 financial controllers, 2 heads of controlling departments, and 2 representatives of IT departments. The interviews were scheduled for around 2 hours and were conducted based on a questionnaire outlining the points for discussion. The same questionnaire form was used to take down respondents' answers. In addition to giving interviews, two manufacturers made available their working documentation that they used to parameterize and implement their ERP systems and user instructions.

Enterprise 1

The first enterprise was a consumer goods manufacturer owned by a multinational corporation running 4 factories in Poland. Its ERP system (SAP R/3; modules FI, CO, MM, PP, and SD) was implemented between 2005 and 2007. According to the enterprise managers, the main purpose of the software was to integrate all corporate data generated by branches operating in different parts of the world and to ensure the standardisation of reports and procedures (month-end closing, budgeting, variance analysis, etc.). Before the ERP system was implemented, the enterprise had used a few IT solutions running in isolation. They had been developed by the IBM programmers to support the HR, accounting and financial departments, the management of production processes and inventories, and sales. After the implementation the SAP R/3 package was the only management accounting software, although spreadsheets remained as one of the major tools used by the controllers.

The enterprise used its ERP to calculate the cost of one unit of a product, with the indirect costs being allocated to finished products by means of absorption standard cost accounting and traditional cost drivers. The system additionally handled operational and investment budget planning and variance analysis. The interviewed managers stressed that the system also supported multidimensional analysis of profitability (by customer, product, or business segment, etc.). Most financial and non-financial indicators (e.g. product quality, numbers of repairs) were calculated with the system, although a Balanced Scorecard was not used in the enterprise.

A notable fact is that none of these management accounting tools was introduced when the ERP system was being implemented or configured, because they had already been used in the enterprise for a time. The proven and familiar management accounting tools and techniques were transferred to SAP R/3 and automated; before that, all analyses had been performed in the management accounting department manually, with Microsoft Excel spreadsheets.

The enterprise was at a stage of replacing its management philosophy oriented to mass production with one focused on customers, and the top management decided that Lean Manufacturing Principles should be implemented. The decision gave rise to discussions about the required adjustments in management accounting (e.g. in the concept underlying performance measurement and cost accounting), but no actions were taken at that time yet.

Enterprise 2

The second enterprise in the survey, the manufacturer of parts for heavy machines owned by a multinational corporation, implemented its SAP R/3 system (modules FI, CO, MM, PP, and SD) in 2008; before the system was introduced the enterprise had used several applications running in isolation. The implementation process was very fast, because all modules were functional within six months from making the decision to purchase the system. According to the head of the controlling department, the package was installed in the first place to integrate management accounting across the corporation and to improve the quality of management reporting.

The head of the management accounting department underlined that their SAP R/3 was important for calculating product cost per order. The standard marginal cost obtained from the system was used to make short-term decisions and the absorption standard product cost served the purpose of stock costing. The system supported operational budgeting and variance analysis, but more detailed analyses were performed with spreadsheets. Additionally, the system enhanced and expanded various aspects of profitability analysis.

The ERP was not used to plan and control investment budgets, or to manage net working capital. Besides, the controlling department or the financial department used spreadsheets to calculate key financial and non-financial indicators.

The management accounting tools and practices did not significantly change after the system was introduced. The cost accounting method, profitability analysis and the budgeting process that the enterprise used at the time of the survey had already been functioning for a time. The only major change that came with the system was that budget planning started to use a new structure of cost and profit centres, previously undistinguished, which was proposed by the consultants and the controlling department. This solution made the cost responsibility system much more effective. Moreover, SAP R-3 enabled a broader use of multiblock contribution margin costing, thus facilitating analyses in the short term.

A very interesting finding is that the enterprise virtually did not use its ERP to calculate indicators, to plan investment budgets, and to manage net working capital, although the system had the module and transactions that made the operations technically possible. They were carried out with spreadsheets.

Enterprise 3

The third enterprise was owned by a multinational producer of rubber and textile cleaning products. Its Microsoft Dynamics Nav system was introduced in 2011 to replace SAP Business One. The operation aimed to standardize the corporate software.

The enterprise presents a case that is both interesting and different from the other investigated enterprises, because its key management accounting tools, e.g. cost accounting and budgeting, practically always functioned outside the ERP system. The absorption standard cost of product and order was calculated with a spreadsheet and then the numbers were transferred to the ERP. The planning of the operational, investment and long-term budgets (5 years) and variance analyses also made a broad use of spreadsheets.

The financial director of the enterprise stated that the system replacement did not have any effect on their management accounting tools and methods. In fact, the enterprise's management accounting treated the system as a database allowing quick access to analytical and reporting data. Consequently, its contribution to improved quality and innovativeness of the accounting tools was very limited.

Enterprise 4

The next enterprise, a global leader in the package industry, implemented its SAP ECC (the FI, CO, MM, PP, SD, and QA modules) in 2002. The method used for calculating the unit cost of a product changed two years later – the traditional additional calculation method was replaced by activity-based costing (ABC). The indirect unit cost of each finished product was calculated by dedicated software, which was developed specifically to meet the enterprise's needs. The obtained numbers were entered into the SAP ECC system to compute a standard absorption cost of a product.

As an operational budgeting and variance analysis tool the system was used more broadly, although budget planning was additionally supported by the Oracle Hyperion Planning system.

The head of the controlling department stated that their ERP made it possible for them to extend the analysis of profitability. However, investment budgeting and the management of net working capital used the readily available analysers, with the necessary data being derived from the ERP. The Balanced Scorecard which was introduced in 2009 also functioned outside the integrated system. It was prepared using a spreadsheet in the form of a table into which indicators precalculated by the controller were manually entered.

In the fourth enterprise the implemented ERP did not induce major changes in management accounting, improving only the process for obtaining analytical and reporting data. Not only were new management accounting tools, e.g. ABC and Balanced Scorecard, implemented relatively long after the ERP had been introduced, but they were also used outside the integrated system. The manager of the controlling department remarked that the ERP was a management accounting database rather than an analytical tool.

Enterprise 5

The fifth enterprise was an FMCG manufacturer laying emphasis on lean management. The enterprise started to practice lean management in 2007, after it was acquired by a Japanese corporation that successfully applied Lean Thinking to three areas: management, production and accounting. As soon as the acquisition was complete, a decision was made that SAP R/3 would be installed. The system became fully operational on 1 January 2010. The enterprise already ran an ERP system (Microsoft Dynamics Navision), but the new system was to ensure integration between the enterprise and its new owner. The following SAP R/3 modules were implemented: FI, CO, MM, PP, and SD. Other applications, such as spreadsheets, Microstrategy and other Business Intelligence solutions were run in the enterprise in parallel with SAP R/3.

Although the primary costing method used in the enterprise was standard absorption costing, *kaizen* costing and target costing were also applied. *Kaizen* and target costing were introduced by the new Japanese owner, but standard absorption costing had been used before and continued in an almost unchanged form. While a unit cost of a product was calculated within standard absorption costing by the ERP, both *kaizen* and target costing were performed outside the system and were only used for management reporting purposes.

The budgeting process in the enterprise consisted of traditional annual operational budgeting, three-year forecasts and rolling budgeting where the budget is updated on a monthly basis according to new forecasts. However, the ERP system only handled the annual budget, which was also the only one that the system analysed for variances. Traditional budgeting and variance analysis had been performed in the enterprise before SAP R/3 was introduced, but rolling budgeting was introduced by the new owner. A particularly interesting finding is that the rolling forecasts and the analyses of their variances were obtained from Microstrategy or from other available software, but not from SAP R/3.

The ERP was also used to supervise the investment budget and to prepare variance analyses, although investment projects were forecast and evaluated using spreadsheets. The enterprise's SAP R/3 did not affect the investment budgeting tools, the only change being that some operations were transferred from this area to the ERP. The methods for managing net working capital and for performing profitability analyses did not change either. It is noteworthy, though, that the preparation of variants of profitability analysis became much easier with the introduction of profit centres. The information needs of the new owner caused that new financial and non-financial indicators were implemented, or those used were modified. The representative of the accounting department commented, though, that the indicators they were calculating changed relatively little and that SAP R/3 increased the speed of calculation and improved the accuracy of measurements.

The enterprise's management accounting system changed mainly because of the Japanese owner's demand for information. The innovative management accounting tools, such as *kaizen* costing, target costing and rolling budgeting, whose introduction coincided with the implementation of the ERP system were necessitated by the corporation managers, who wanted to ensure that management accounting was consistent across the global corporate structure. An important fact is that none of the tools was incorporated into the ERP system, but they were used within other analytical software that obtained the necessary data from the ERP. The management accounting tools that SAP R/3 supported had been introduced to the enterprise before.

Enterprise 6

In the sixth enterprise the implemented ERP system had a significant impact on its costing and budgeting methods. The enterprise was one of several tens of factories owned by a multinational corporation. In 2010 it was acquired by another multinational, which resulted in a major restructuring of its organization and business processes. The new owner decided that the enterprise should have the same SAP R/3 system that was already used across the corporation, greatly facilitating the operation of the corporate business model. Before the new system was installed, the enterprise had used many isolated applications to handle various aspects of its business, such as payroll, production, warehouse, etc. As indicated by the representative of the management accounting department, the multitude of applications made the delivery of management information a very burdensome task.

The five SAP R/3 modules that the enterprise implemented were FI, CO, MM, PP, and SD. Standard absorption costing was introduced together with the ERP system. Earlier on the product costs had not been calculated. The management accounting department had concentrated its efforts on controlling enterprise's operating expenses, particularly its indirect costs and labour costs. The new owner decided that it was necessary for the corporation to know the enterprise's costs of a product. Standard absorption costing that the corporation used was proposed as the method for their calculation.

Budget planning also changed significantly in the enterprise, because the budget was transferred to SAP R/3. Although the system allows generating budget variance reports, more detailed analyses were prepared with a spreadsheet. The enterprise's controller stated, however, that with SAP R/3 providing better access to the budget variance data, variances could be calculated on a monthly basis, while in the pre-implementation period only limited quarterly information had been compiled.

Additionally, the introduction of the ERP system enabled the presentation of more precise analyses of product and order profitability, the cost control system became more efficient and the managers assumed greater responsibility for their costs (because of the new system of cost and profit centres). The immediate reason for the enterprise to implement new cost accounting and budgeting solutions was organizational changes made during the previous twelve months. The new owner proposed introducing the same management accounting tools as those used in its other facilities to ensure that standard and consistent management accounting information was produced. In this process the ERP system was only a tool improving the availability of information.

Conclusions

The above analysis of six enterprises shows that the introduction of ERPs did not induce major changes in their management accounting systems. Thus, the hypothesis that the implementation of an ERP system entails the introduction of new, innovative solutions concerning management accounting cannot be accepted. In two enterprises modifications (a new cost accounting

system or a different concept of budgeting) were made to address the information needs of the new corporate owners and to ensure that consistent management accounting tools and methods were used across their global structures. The implemented ERPs did not encourage the use of modern and innovative solutions supporting cost accounting, budgeting or measurement of performance either. Moreover, two enterprises ran their more advanced cost accounting systems, i.e. target costing and ABC, outside the ERP packages. Nevertheless, all respondents stated that the quality of information and of the reports they delivered greatly improved after the packages were installed. The time needed to generate data and perform analyses also shortened significantly. The ERPs unquestionably streamlined processes in the management accounting departments, for instance by automating many functions and procedures, thus allowing their staff to concentrate on the value-adding processes. As in the case of the Granlund and Malmi findings (2002), it can be concluded that ERPs consolidated the organizations' management accounting methods and tools rather than making them innovative. On the other hand, though, it is difficult to determine beyond any doubt whether the enterprises would have decided to implement any changes and new controlling solutions without the systems.

Because the sample contains only 6 enterprises, the results of this survey cannot be treated as representative of all ERP implementations. But even contradicting the original research hypothesis, they are highly consistent with the findings of other authors (mainly Scapens and Jazayer, 2003; Granlund and Malmi, 2002), thus confirming that ERP systems have some limited effect on the shape of management accounting in an enterprise.

Except for the consistency, the presented results are surprising. Three of the sampled enterprises used traditional cost accounting systems and budgeting methods that they had introduced many years before. The sixth enterprise also chose to implement traditional standard absorption costing. While all the respondents were aware that the solutions they used were imperfect and stressed that their management accounting systems needed improvement, they agreed that the introduction of an ERP was inopportune for making changes in this area. The controlling departments were actively involved in parameterizing and implementing their ERPs during each implementation, which placed a substantial burden on their time and human resources. One of the interviewed controllers stated that the process was so complicated and difficult that having to implement correctly their present solutions and to customize the system to their needs they lacked the time to come up with new solutions. This makes it worthwhile to consider whether the implementation workload resting on the controlling departments should not be eased to allow them more time for developing new concepts. The complexity and high costs of the ERP systems also make managers considering the implementation of new management accounting tools (e.g. ABC) opt for new dedicated software or readily available analyzers, rather than trying to adjust their ERPs. The choices that managers make are determined by the time consuming and costly adjustments of the solutions available within the ERP systems.

It is also a fact that the very introduction of an ERP system may make the implementation of further changes much more difficult, because once the system is installed and all the related problems are sorted out (which may go on for as many as several years) all projects that make it necessary to rethink and redesign its elements, as well as actions that could disturb the status quo, are not welcome. However, the only way to confirm whether this conclusion is true is to survey the same enterprises again in several years' time, after the learning curve mechanism starts to operate (see Matolcsy et al., 2000).

ERP impacts are also interesting in the context of the discussion about factors determining changes in management accounting. Because the changes may be evolutionary rather than rev-

olutionary (see Burns and Scapens, 2000), further research is needed to determine whether or not the introduction of an ERP system makes a management accounting system change.

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Appendix

The interview guidelines:

1. Basic information about the company (size, branch, number of employees, revenues)?
2. Owner of the company (private, governmental)?
3. When ERP system was introduced?
4. What was the length of the introductory period?
5. What were the reasons of the implementation?
6. What is the name of the ERP system introduced in the company?
7. What modules were introduced and when?
8. What was the role of management accounting department in the introduction?
9. For what purposes is the system actually used in management accounting (cost allocation and product cost calculation, budgeting, variance analysis, investment appraisal, working capital management, profitability analysis, Balanced Scorecard, calculation of financial and non-financial indicators, others)?
10. What are new tools and methods introduced with the new ERP system (new costing techniques, new budgeting method, introduction of Balanced Scorecard, new financial and non-financial indicators, other methods of performance measurement, new cost/revenue centres, new methods of profitability measurement, new methods of cash management and working capital management, new methods of investment appraisal, other tools for strategic management, others)?
11. What are other analytical tools/programs (except for ERP system) used by management accounting department?
12. What are changes in the management system of the company that coincided with ERP implementation (new business model, organisational changes, change in autonomy, others)?
13. Has ERP introduction influenced controller's role, functions, responsibilities?
14. What are in Your opinion, benefits for the company of ERP introduction?
15. What are in Your opinion, the disadvantages of ERP system introduced in you company?