THE IMPACT OF ENTERPRISE RESOURCE PLANNING SYSTEMS ON MANAGEMENT ACCOUNTING

Andreea Gabriela PONORÎCĂ[*]
Ahmed H. Juhi AL-SAEDI[**]
Hamza H. SADIK[***]

Abstract

The added value on the ongoing improvement process of forecasts for financial and non-financial information systems is the main object of this study during nowadays context. Our results reveal the findings of an empirical research on the communication with various software vendors, such as SAP or Oracle, confirming the hypothesis that enterprise resource planning systems are not so well connected with the field of financial reporting analysis, but strongly linked with the management accounting field. Our study is and will be further opened for future research, passing over the limits of resource planning.

Keywords: *management, budget, resource, information system, financial reporting.*

1. Introduction

1.1 Research background

Organizations have become more complex in terms of their corporate structure and geographical presence due to the globalization process, and they are facing an increasing amount of data to be handled in daily operations. The more and more changes of the business environment and the increased complexity of the companies' activities need to permanently adapt, in an alert rhythm, which sometimes exceeds the effort and analysis capacity of the human factor. In order to overcome the problems incurred by different information systems within the organization, companies have integrated all their operational systems into one single system (Shang and Seddon, 2002). This could refer to enterprise system software (ESS) which consists of, for example, enterprise resource planning (ERP), supply chain management (SCM) and customer relationship management (CRM). These systems are already considered 'classic' imperatives within the big companies, a very important condition for maintaining the competitive advantage. ERP systems enable organizations to integrate business processes and functions and they can supply managers with real time information. Consequently, ERP systems are considered to provide management means to respond more efficiently to changes in the business environment (Spathis and Constantinides, 2003).

While ERP originated from manufacturing and production planning systems used in the manufacturing industry, ERP expanded its scope in the 1990's to other 'back-office'

[*] Lecturer, PhD, Faculty of Accounting and Management Information Systems, The Bucharest University of Economic Studies (e-mail: andreea.ase@gmail.com).
[**] PhD Candidate, Faculty of Accounting and Management Information Systems, The Bucharest University of Economic Studies (e-mail: ahmed.alsaaida@yahoo.com).
[***] PhD Candidate, Faculty of Accounting and Management Information Systems, The Bucharest University of Economic Studies (e-mail: hamza970@yahoo.com).

functions such as human resources, finance and production planning (Nieuwenhuyse, Boeck, Lambrecht, & Vandaele, 2011).

An ERP system, by linking all systems through a data warehouse, allows a company to manage its operations holistically. A second impact of ERP systems has been a general shift to manage at the activity level rather than at the more abstract level of financial transactions.

This paper presents, based on the background of the studies conducted by various researchers and economists, the relation between management accounting and ERP systems, as well as the influence of a good ERP implementation on the management accounting and on the company, as a whole.

2. Literature Review

The interaction between the ERP systems and management accounting is quite a new research topic and is continually developing. The emergence of ERP systems has signified the beginning of a new era in the business environment, where companies can integrate business processes/applications and respond to real-time information (Stefanou, 2002; Nicolaou, 2003; Spathis, 2006).

Nevertheless, the focus of the relevant literature has been on ERP systems in general and there is limited published scientific evidence on the ERP implementation processes and their effects on accounting in particular (Granlund and Malmi, 2002; Sutton, 2006).

According to quite recent studies, the implementation of ERP systems affects the accounting processes and the accountants' role (Granlund and Malmi, 2002; Scapens and Jazayeri, 2003).

Spathis and Constantinides (2003) identified in their study the benefits of ERP systems which include: increased flexibility in information generation, as well as improved quality of reports and financial statements. Also, in 2004, they examined the impact and the changes occurred by replacing the traditional information systems with ERP systems, in terms of accounting application. One relevant finding of the study was the fact that ERP implementation produced important benefits for accounting.

Further, researchers have investigated the impact of ERP systems on management accounting. Both, Matolcsy and Wieder (2000) studied the effects of ERP systems on management accounting. Although they did not observe significant differences between ERP adopters and non-adopters regarding the use of advanced management accounting techniques, they concluded that ERP systems function as a driver behind the adoption of modern management accounting techniques. According to the researchers, implementation of the new ERP system did not change the management accounting practices. Nonetheless, the study provides evidence that ERP systems reduce the time needed for execution of routine tasks and, thus, leaves accountants additional time to conduct more useful information analysis.

Expectations for ERP systems to change management accounting were introduced by Kaplan and Cooper (1998), especially through the fourth of their four-stage model for cost and performance measurement systems. When speaking about first stage systems of a company, these systems are basically inadequate for all purposes, even for financial reporting. When improvements are made, the first stage companies tend to add financial systems to meet regulatory requirements. As a result, they evolve into second stage systems where financial reporting systems dominate; these companies being driven by financial reporting. The companies with third stage systems have customized, relevant cost management, financial reporting, and performance measurement systems; however, these systems are independent. ERP systems are only used with the fourth stage systems where ERP systems integrate cost management, financial reporting, and performance measurement (Kaplan and Cooper, 1998).

Kaplan and Cooper (1998) also state that the integration with ERP systems allow all managerial processes, including budgeting, what-if analysis, and transfer pricing to be also based on activities rather than only on dollars. Furthermore, the activity-level focus of budgeting leads to more accuracy in forecasting the demands for all direct and, especially indirect activities.

Cook et al.'s (2000) field study suggests that ERP systems can increase the effectiveness of capital budgeting by anchoring financial numbers to activities rather than stopping at monetary measures with pre-ERP practices. Their arguments were convincing, yet not able to be verified.

Scapens and Jazayeri (2003) reviewed the literature to find that 'ERP systems are having relatively limited impacts on management accounting and management accountants'. According to the literature, the purpose of Scapens and Jazayeri (2003) was 'to explore the processes of change and to examine in more depth the nature of the changes in management accounting which have accompanied the implementation of an ERP system … within a specific organization.' The latter lead to more information sharing and teamwork on one hand and greater centralization of information processing activities (pp. 216- 218) on the other. Although the authors considered three years to be long enough to study the change process, this would not appear long enough given the existence of institutional forces (Burns and Scapens, 2000).

Booth et al. (2000) analyzed the extent to which the application, by an enterprise, of an ERP system can result in the adoption of new accounting practices. It was concluded that ERP systems represent data sources for new accounting practices, being designed to support that practices. More exactly, Rom and Rohde (2006) found that ERP proved to be very useful in terms of data collection, as well as management accounting. This was further confirmed by Javernpaa (2007), who noted that such systems lead to more efficient development of the routine activities, adoption of new management accounting practices, use large databases more quickly and reporting in a more flexible and faster way.

According to Colmenares (2009), the implementation of the ERP systems generated benefits for the enterprise, consisting of the improvement of the decision-making processes, as well as enterprise integration.

On contrary, Kelton et al. (2010) noted that the effects of the information presentation, through ERP implementation are pervasive and affect the decision making processes in various contexts.

There are some reasons for which the days of the ERP systems are considered numbered, due to the shift regarding the way in which people consume products and services. It is considered that ERP systems were specifically designed for the 20thcentury manufacturing era rather than the 21st century services-based world, according to Tien Tzuo, the CEO of Zuora (2012).

In the literature there are also additional studies which indicate that ERP systems improve the decision making process within an organization (Spathis, 2006; Spathis and Kanellou, 2007), other benefits derived from ERP implementation being: more accurate reports - statements of accounts and improved service of accounts in accounting tasks (Velcu, 2007; Colmenares, 2009). Furthermore, Brazel and Dang (2008) pointed out that ERP implementation appears to reduce reporting lags.

To sum up, in the literature exists confusion regarding the potential for ERP systems to change management accounting, as well as confusion regarding the changes that have actually occurred. Perhaps management accounting will take longer to reflect changes because of the institutional forces (Burns and Scapens, 2000).

3. Management accounting and budgeting in organizations

In what concerns the accounting history, Gomes et al. (2011) encourage accounting historians to function as 'change agents' in shaping public opinion and public policy decisions, in order to enrich the new area of management accounting.

Additionally, Jacobs (2012) finds a need for exploring new areas of accounting due to social change in which accounting plays an increasing role. This requires new types of accounting theory and research in order to understand the social context in which accounting operates.

Gomes et al. (2011) emphasize the importance of accounting history studies since they often reveal how accounting emerges, its impacts on society and its social setting. These are important elements in the further development of management accounting techniques and especially the nuances of accounting techniques which need further attention.

Management accounting is often defined as a system that provides useful information for managers in terms of decision making, planning, control and performance evaluation (Drury, 2004). A definition by Atkinson et al. (2001) describes management accounting as:

'A value adding continuous improvement process of planning, designing, measuring and operating nonfinancial and financial information systems that guides management action, motivates behavior, and supports and creates the cultural values necessary to achieve an organization's strategic, tactical and operating objectives' (Atkinson et al., 2001).

As pointed out by Atkinson et al. (2001), the functions of management accounting include operational control, product and customer costing, management control as well as strategic control.

Likewise, the role of management accounting is increasingly expanded and diversified (Baldvinsdottir et al. 2010).

Management accounting information refers to the accounting information used inside the organization. By tradition, accounting information has been considered financial in its nature.

However, management accounting information has begun to encompass also non-financial information such as quality, as well as subjective measurements for example, customer satisfaction (Atkinson et al., 2001).

The role of management accountants have changed significantly in the past 15 years. The paper by M. Newman, C. Smart and I. Vertinsky (1989) suggest that major tasks of management accountants are score-keeping and maintenance of financial records for internal and external users. However, in 1995 R. Kaplan identified new tasks and roles for management accountants. He proposed for the future management accountants to be involved in formulating and implementing corporate strategy and designing organization's management information systems. Similarly, Cooper (1996a, 1996b) argues that management accountants need to develop skills in system design and implementation, change and strategy management as well as in cost management.

Relatively recent research in the area also suggests that the role of management accountants is changing. Pierce and O'Dea (2003) have questioned managers' opinion concerning the future role of management accountants and found that the major elements include: partnership, physical location, teamwork and understanding of the business. Pierce and O'Dea (2003) suggest that future management accountants need not only knowledge of accounting and finance but also knowledge of the company's business, especially understanding of production and sales activities.

So, management accounting is about providing users in organizations with useful information to make decisions. Unlike financial accounting whose objective is to provide information to external parties, management accounting information is meant for internal use.

Budgeting is a widely known management accounting tool, as well as the most commonly used one. It approaches a company's financial situation in an operational way, giving information in a manner that supports managers in planning and control procedures. Budgeting, which is considered the cornerstone of management accounting, still plays an important role in organizations despite the criticism directed towards budgets. Organizations prepare budgets for different reasons; the four most important reasons identified by Hansen and Van der Stede (2004) include: operational planning, performance planning, communication of goals and strategy formation.

Budget planning is the process of preparing the budgets that are implemented by an organization. Private and public organizations can prepare the budget planning, and then set up actual budget planning processes to meet their organization's policies, procedures, and requirements for budget preparation.

Budget planning is integrated with other modules, so that you can bring in information from previous budgets, actual expenditures, fixed assets, and human resources (Microsoft, 2014).

4. ERP systems in organizations

Enterprise resource planning (ERP) systems have enabled organizations to exploit better their business information. Since introduction in the mid-1990s, adopters of ERP systems have increased rapidly (Drury, 2004). The most significant factor that distinguishes ERP systems from previous generations of information systems is that ERP permits organizations to integrate business processes and optimize the available resources. According to Zeng et al. (2003), an EPR system should be: flexible, modular and open, comprehensive and beyond the company.

ERP vendors market their ERP products by promising advantages such as: 'Gain new market insights and adapt quickly to market changes. Sense and respond to customer requirements in real time. Extend processes beyond the organization to include customers, suppliers, and partners' (SAP, 2005). However, implementation of ERP does not automatically provide any benefits for the organization. Poston and Grabski (2001) have listed benefits that companies expect ERP to entail – these include for example, reduced administration costs, improved decision making, more accurate and timely information, increased customer satisfaction and flexibility to react to changes in the environment.

Shang and Seddon (2002) have created a framework to summarize the benefits from enterprise systems (including ERP systems). According to the researchers, the benefits of an ERP system can be classified into five different dimensions: operational, managerial, strategic, IT infrastructure and organizational benefits.

There have also been several studies investigating the economic benefits of the ERP systems. Researchers from all over the world examined weather the implementation of the ERP systems have a positive impact on the performance of a company. Consequently, the study concluded with mixed results. However, the researchers found significant differences when adopters and non-adopters were compared – while the financial ratios of adopters remained somewhat unchanged, the financial performance of non-adopters weakened during the same time period.

5. ERP systems and management accounting

According to Atkinson et al. (1997), management accounting should help organizations to adapt to changes in the business environment. Management accounting should facilitate organizations to identify the need to undertake change by suggesting appropriate measures. Equally important, management accounting should not hinder change by emphasizing performance measures that maintain the status quo.

On the other hand, ERP is serving as a means to facilitate organizations to change. Based on the relevant literature, this paper tries to analyze whether the implementation of the ERP systems provide better ways to conduct management accounting or is only maintaining the status quo.

At the micro level, management accounting techniques have traditionally concentrated on supporting middle-level managers to supervise shop floor workers. At the macro level, management accounting is used to coordinate the centralized decision-making as well as to provide information for decision-making in the decentralized organization (Atkinson et al, 1997).

Atkinson et al. (1997) also suggest that management accounting can lead to development of routines based on past experience. Although these routines will help organizations to respond to similar type of circumstances as encountered in the past, they reduce organizations' ability to respond to new events.

5.1. The influence of ERP implementation on management accounting

The influence of ERP systems on management accounting was studied by Booth et al. (2000). Later cited by Granlund and Malmi (2002), Scapens and Jazayeri (2003), Spathis and Constantinides (2003) and Spathis and Ananiadis (2005), the study of Booth et al. (2000) is one of the first papers analyzing the relationship between ERP and management accounting. The survey found that ERP systems are best at transaction processing, whereas they have only limited effects in reporting and decision support. In addition, Booth et al. (2002, like Granlund and Malmi, 2002; and Hyvönen, 2003) did not find evidence that implementing an ERP system would lead to adoption of advanced accounting practices.

The study of Maccarrone (2000) investigated the benefits of ERP implementation towards accounting information and management processes. The researcher identified two categories of benefits related to ERP systems: time related benefits, like reduced need of time to perform some activities, which lead to other benefits and quality-related benefits.

Further, Granlund and Malmi (2002) investigated the effects of ERP systems on adoption of modern management accounting principles in ten companies. The results indicated that half of the companies have integrated their cost accounting practices into ERP environment while the other half exploited stand-alone software (e.g., spreadsheets). Although the respondents did not consider that the ERP implementation has changed the logic of management accounting, ERP was considered to have improved management accounting process through better access to data.

Scapens and Jazayeri (2003) wanted to investigate in more detail the changes in management accounting by studying an SAP implementation in a European company. SAP was seen to have facilitated the work of middle-level and lower-level managers by providing them real-time information. On the other hand, senior managers still need to devote significant time to prepare complex reports. The implementation of SAP program did change some of the management accounting principles in the analyzed company. However, one cannot be sure whether these changes have emerged as a result from the implementation.

The benefits of ERP systems on accounting information and management process have also been researched by Spathis and Constantinides (2003), who identified increased flexibility in information generation, improved quality of reports and financial statements and increased integration of applications as the highest perceived benefits. Another study by Spathis and Ananiadis (2005) recognized three dimensions of benefits: managerial, operational and IT infrastructure.

The paper by Hyvönen (2003) studied whether there exist differences between ERP and BoB adopters regarding current management accounting practices and adoption of more advanced management accounting techniques. Thus, Hyvönen (2003) noticed that ERP adopters had more problems in budgeting process compared to BoB adopters. Furthermore, ERP adopters derived fewer benefits from the new system.

New research on the impact of ERP implementations reveals mixed results. Although respondents proved to be satisfied with their software choice and ERP implementation, the survey showed that most of the ERP projects run over budget and the users do not exactly receive expected benefits (Krigsman, 2013).

In another recent study (2012), conducted by the Manufacturing Performance Institute, on behalf of Plex Systems Inc., the participants affirmed that, most likely, the accounting management has been improved through the implementation of the ERP systems.

The results of all these studies are quite contrasting, depending on the different perceptions and understandings of ERP. The common feature of these studies is that all of them concluded that there exists only weak or moderate impact of ERP on management accounting.

5.2. Changing role of management accountants

Besides the effects of ERP systems on management accounting, several studies have examined the implications of ERPs implementation and discussed the changing role of management accountants. Lodh and Gaffikin (2003) reached the conclusion that accountants are becoming business process analysts, work at all levels in the improvement process and also that accountants have to change their attitude in order to be able to manage real-time cost management systems.

According to Granlund and Malmi (2002), ERP systems have given management accountants new work tasks. On the other hand, ERP systems have eliminated routine works previously done by management accountants (Scapens and Jazayeri, 2003). In addition, Granlund and Malmi (2002), Scapens and Jazayeri (2003), as well as Spathis and Constantinides (2003) suggest that ERP systems pose new requirements for management accountants - to have a good understanding of organization and its different activities and processes.

Spathis and Constantinides (2003) also suggest that management accountants need to have good IT skills to keep up with the constantly changing IT environment. Furthermore, Caglio (2003) agrees that the role of accountants is changing. She uses the term 'hybridization' of accountants meaning that accounting knowledge get dispersed in organizations when IT and line people start using accounting information due to the new ERP system.

Doran and Walsh (2004), in their research of analyzing the effects of ERP implementation on accounting techniques and practices have reached the conclusion that the implementation of the ERP systems had an effect on the role of management accountants, consisting of new tasks and responsibilities, the accountants becoming agents of change within the organization.

As the specific literature presents, there are conflicting views related to the adoption of an ERP system, which can bring a redefinition of the management accountants' tasks and responsibilities (Brazil and Li, 2005; Carruth, 2004; Gabriels, 2002). It is clear that ERP is influencing the management accountant and is a valuable tool which assists the management accountants in fulfilling their core activities. However the core responsibilities remain the same, providing the financials on a monthly basis still remaining a high priority in any company.

6. Conclusions

Based on the literature review, there could be clearly stated that ERP systems have only a limited impact on management accounting. Booth et al. (2000) find that ERP systems are powerful tools with regard to transaction processing, whereas reporting and decision-making are not well supported by the systems.

The findings of their study confirmed the previous researches, as they demonstrate the fact that ERP systems have no significant relationship with reporting and analysis, budgeting, non-financial, external and ad hoc management accounting, as well as allocation of costs. However, a significant and positive relationship is found between ERP systems and data collection and organizational breadth of management accounting. It is confirmed that ERP systems are powerful tools with regard to transaction processing and integration of the organization, as data collection can be considered a proxy for transaction processing, and organizational breadth of management accounting a proxy for integration.

ERP systems also have the capability to help in the current management accounting activities. This conclusion supports the claim that having an ERP system is still better than having no ERP system with regard to the existing management accounting tasks.

Also, ERP systems are changing the practices of capital budgeting and management accounting. ERP systems lead to highly standardized and highly computerized information. Without significant changes, ERP systems are allowing capital budgeting, budgeting, operating statements, forecasting, performance measurement, and costing to be more detailed, more accurate, and reported more quickly.

It is proved, through the conducted studies over the past decades that there has been a shift in the role of the management accountant and accounting, as a whole. ERP implementation is one of the major contributors to this change. Accountants consider that ERP allows them to expand their roles and instead of producing figures, they dispose of more time for further analysis and value adding activities in areas such as cost control.

Although there are negative aspects of the ERP implementation in management accounting, the truth is that, overall, there also exist positive aspects, which certainly outweigh the negative ones.

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