ERP Systems and Auditing: a Review

Alexandra Kanellou1 and Charalambos Spathis2

Division of Business Administration, Department of Economics, Aristotle University of Thessaloniki, Greece
1alexandrakanellou@hotmail.com, 2hspathis@econ.auth.gr; hspathis@gmail.com

Abstract

In order to further advance research within auditing and ERP systems, an understanding of what research has already been done and what research is needed is of particular importance. The purpose of this study is to uncover, classify and interpret current research within auditing and ERP systems. This is done partly to identify research gaps and propose directions for future research and partly to guide researchers and practitioners investigating and making decisions on how to better synthesize the two areas. This study also tries to examine how and to which extent the implementation of ERP systems in the organizations affect audit procedures and auditors’ roles. The outcome of the review is an identification of research gaps and a proposal of research opportunities within different research paradigms and with the use of different methods.

Key words: ERP systems, Auditing, IS Auditors-Financial Auditors, IS Audit, Internal-External Control.

1. Introduction

Of all the business changes that have occurred throughout the history, the most explosive has been related to information technology (IT). IT has become increasingly complex. The explosive growth in IT includes computer hardware, databases, networks, telecommunications, the Internet, extranets, e-commerce, client-server architecture, data warehouses, integrated accounting systems software such as ERP software, automated reasoning systems and neural networks software (Cerullo and Cerullo 2003). The implementation of information systems helps companies have more and better information available to them, delivered much faster than before and has a tremendous impact on information management and business process redesign (Davenport, 1998).

ERP systems are defined as “information systems packages that integrate information and information–based processes within and across functional areas in
an organization" (Kumar and Hillegersberg, 2000). An ERP system is an enterprisewide system implementation that affects many, if not all, departments of a company. Thus, understanding each department and its concerns is important (Gallegos, 2005). ERP systems appear to be the system used by the majority of large clients serviced by audit firms. Thus, ERP systems are the dominant system environment for auditors servicing public clients, although the clients of audit firms use a variety of systems to process accounting transactions (Brazel, 2005). Yen et al. (2006) and Coppers & Lybrand (2002) also mention that auditing personnel must properly deal with the change caused by the ERP system.

The traditional audit model has undergone significant change during the last decade. The change in the financial audit’s focus is attributed to market pressures, including saturation, competitive pricing and increased training and technology (Eilifsen et al.2001). The audit has taken on risk management focus, and audit engagement teams increasingly include information system specialists (Winograd et al. 2000). Concurrently, the profession has moved toward offering additional systems assurance services. For example there has been a paradigm shift in assurance services, which focuses on the internal control systems throughout an information system’s life cycle (Arnold et al. 2000; O’Donnell et al. 2000).

Auditing can be classified into two types: internal auditing and external auditing. Internal auditing can be described as a method independent and objective validation and consultation. Not only it increases the value and improves the operation of an organization, but also facilitates the effects of related processes to reach the objectives of the organization. Because of its highly in-house nature, internal auditing cannot be managed outside of the organization. Spathis and Constantinides (2004) also, found that the implementation of an ERP system is usually followed by an increase in internal audit procedures. As a result the enterprise can reach a higher level of integration in business processes and improved quality of reports.

On the other hand, external auditing is conducted outside the organization. The company hires the services of external auditors who are mainly accountants. When ERP system was introduced, firms developed high regard for computers because they can achieve rapid calculation, they provide high precision and accuracy of information and thus they increase the quality of accounting work.

Computer aided auditing is beneficial, but it also has some disadvantages. Besides changing the operation and process of auditing, computer aided auditing involves the distribution of various files in different locations, thus making auditing even more difficult and complicated especially for those who do not have sufficient knowledge of the technology. In addition, many ERP systems involve journal recording. This means that those not involved in the operation department may not be able to identify the personnel responsible for some data they may need. Another setback may be that personnel from IT department can also modify the figures since they have access to the database. This could cause a company economic losses, which may not be identified right away (Chang et al. 2008).
IT and its advances have changed the methods firms employ to gather and report information. Auditors must determine how the firm uses IT systems to initiate, record, process and report transactions or other financial data. This is necessary in order to plan the audit and to determine the nature, timing and extent of tests to be performed to gain a sufficient understanding of internal controls (Cerullo and Cerullo 2003).

Despite their acclaimed advantages, ERP systems pose potentially heightened business, security and audit risks primarily due to automated interdependencies among business process and integrated relational databases (Hunton et al., 2004). Statement on Auditing Standards (SAS) No 94 (AICPA 2001) calls for auditors to understand the computerized procedures used to prepare an entity’s financial statements and related disclosures. More specifically, SAS No.94 requires auditors to consider how the client’s information technology (IT) infrastructure affects the audit strategy, to design audit tests to determine the extent to which computerized internal controls are operating effectively, and to possess requisite skills to evaluate and test IT systems or obtain help from specialists who have such skills. ERP systems are complex audit environments and therefore auditors need to expand their technological knowledge and skills in order to perform effective and efficient audits (POB, 2000).

The purpose of this study is to uncover, classify and interpret current research within auditing and ERP systems. This is done partly to identify research gaps and propose directions for future research and partly to guide researchers and practitioners investigating and making decisions on how to better synthesize the two areas. This study also tries to examine how and to which extent the implementation of ERP systems in the organizations affect audit procedures and auditors’ roles.

Our review is organized as follows: At first, we present the approach used for article identification and collection. Then, we analyze the bibliography and review. Finally, we draw some conclusions, we state some limitations and we propose directions for future research.

2. Survey search approach

We included academic studies from 2002 to 2008. This was because the last decade has seen a tremendous increase in the use of information technology (IT) and particularly the use of Enterprise resource planning systems. Our purpose concerning previous research was to summarize the effects that ERP systems have on the audit procedures and on the auditor’s (internal-external) role. That’s why we searched the literature by using these specific keywords: ERP, IT, (internal-external) auditing-audit, auditor and internal control.
3. Bibliography analysis

Below we present the Table 1 which contains the journals and the articles which were included in our review:

**Table 1. Journal titles, Authors and Year of Publication**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial Auditing Journal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contemporary Accounting Research</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Management and Computer Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Systems Control Journal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Systems Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Journal of Accounting Information Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Journal of Information Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Journal of Enterprise Information Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>International Journal of Auditing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advances in Accounting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authors and Year of Publication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazel, J. F.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown, W. and Nasuti, F.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cerullo, M. V. and Cerullo, M. J.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chang, S.- I. et al.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grabski, S. V. and Leech, S. A.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hunton, J. E. et al.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maurizio, A. et al.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Messier, W. F. et al.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vendrzyk, V. P. and Bagranoff, N. A.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.1 Audit experience

ERP systems are complex audit environments and therefore auditors need to expand their technological knowledge and skills in order to perform effective and efficient audits (POB, 2000). Specifically the POB states (p.171): “Increasingly, auditors will find it necessary to understand fully the risks associated with new and advanced business information systems, and the controls that are needed to respond to those risks. Auditors also will find that they must expand their technological knowledge and skills, devise more affective audit approaches by taking advantage of technology, and design different types of audit tests to respond to new business processes. Highly skilled technology specialists will become even more essential members of audit engagement teams”.

In this section we point out 3 studies concerning the skills and the experience that an auditor must have, to be able to conduct successful audits in an ERP environment.

Brazel (2005) conducted a study and his purpose was to develop, assess and provide uses for a measure of perceived ERP systems expertise. He was motivated from the “Theory of Planned Behavior” (Ajzen, 1991), which suggests that auditors who perceive that they have higher levels of ERP systems expertise should perceive that they have more behavioral control in ERP settings. Behavioral control refers to the perception of the ease or difficulty of performing the behavior of interest, for example auditing in an ERP environment. He supported that perceived auditor ERP systems expertise may be a significant determinant of auditor behavior and audit quality in ERP environments and is a trait associated with the individual auditor.

He developed a multiple-item scale which included measures of auditors’ perceptions of their experience levels with auditing ERP systems, their time spent auditing ERP systems and how early in their careers they began auditing ERP systems. The multiple-item scale developed in this study was assessed for reliability and construct validity with 73 practicing audit seniors from 4 international and 2 national public accounting firms. Participants had an average of 3.68 years of audit experience (AUDEXP).

Brazel supports that the measure can be used to capture perceived auditor ERP systems expertise as part of an experimental study interested in determining its effects upon auditor performance, audit quality, audit perceptions etc. Furthermore, he mentions that it may be preferable to assign a less experienced auditor with ERP systems background to an ERP systems audit environment than a more experienced senior auditor who may lack this domain of expertise. The measure has the propensity to dichotomize auditors into distinct groups perceiving either low or high ERP systems expertise for experimental research and also to provide significant variation in participant responses for use in survey studies.

Interestingly, the results of Brazel’s study suggest that auditor perceptions of ERP systems expertise are not significantly related to general AUDEXP. Therefore, it
may not be prudent to assume that auditor perceptions of ERP systems expertise automatically increase in conjunction with the longevity of their audit careers.

Moreover, Brazel and Agoglia (2007) pointed out that in complex AIS environments, both auditors’ AIS expertise and their evaluations of CAS (computer-assistance specialist) evidence play a critical role in determining audit quality. They continued stating that although complex AIS (such as ERPs) and CAS have become common fixtures on audit engagements, little prior research has examined how they affect auditor judgments. Thus, in their study, they contributed to the literature by exploring the moderating effect of auditor AIS expertise on control risk assessment and the nature, staffing, timing, extent and effectiveness of planned substantive testing. In addition, they examined a mechanism behind this moderating effect. The findings of this study suggested that AIS expertise plays an important role in complex AIS environments and appears to be most critical when CAS competence deficiencies are present.

In a study concerning ERP and Sarbanes-Oxley Act, Chang et al. (2008) state that, for auditors in an ERP environment, it is more important to know how to use the information provided by the system than have increased audit experience.

At this point, we should mention that AIS expertise plays an important role in complex AIS environments, in order to have successful auditing. As Brazel (2005) states “it may be preferable to assign a less experienced auditor with an ERP systems background to an ERP systems audit environment than a more senior auditor who may lack this domain of experience”.

In conclusion, the information provided by the ERP system during auditing plays an important role. The latter role is more significant than the presence of an experienced auditor.

### 3.2 Financial auditors and IT auditors - differences in risk assessment, roles and perceptions

Vendryzk and Bagranoff (2003) described and contrasted IS and financial auditor’s perceptions of the current and future role of IS auditing within the five largest accounting/professional services organizations in the United States. The primary objective of this study was to examine whether there are differences between IS and financial auditors’ perceptions of the evolving role of IS auditing. They conducted a field study of 20 senior managers and partners among these five firms. Each participant was a financial auditor or a systems auditor. They gathered responses to both open-ended subjective questions and five objective questions. In other words they investigated the perceptions among auditors about the evolution of the IS audit function, by focusing on the two major roles of the IS audit practice: 1) its relationship to the financial audit and 2) the expected growth in the IS audit practice itself. They concentrated on the largest accounting/professional services firms to better examine state-of-the-art auditing/assurance practices.
In general they found that IS and financial auditors have different perceptions about the current and future relationship between IS and financial audit and differ in their opinions of clients’ expectations for future audit services. More specifically, the results showed that financial auditors are more likely to indicate that the financial audit will continue to dominate the IS audit. IS auditors see a growing IS dominance over the financial audit. Although financial auditors perceive the audit of general controls to be more important than IS auditors do, both groups believe that IS audit’s focus on control evaluation includes a mix of general and application controls with a growing focus on risk assessment. In evaluating the expected growth of the IS audit practice itself, financial auditors are more likely to interpret audit services and the need for services provided in terms of the financial audit, while IS auditors are more likely to take a broader view. Finally, the researchers state that as firms struggle with the significant changes occurring in their environment due to IS, understanding differences in the perspective of these two groups is critically important to accounting researchers, practitioners and educators. They supported that more research is needed to understand these differences and determine which is the best way to overcome them, so that financial and IS auditors work together in order to improve audit practice.

Furthermore, the purpose of another study (Hunton, et al. 2004) was to examine the extent to which financial auditors recognize differences in the nature and extent of unique business and audit risks associated with ERP systems, as compared to traditional computerized (non-ERP) systems. They also investigated financial auditors’ level of confidence in assessing such risks and their propensity to seek consultation with information systems (IS) audit specialists in their firm. A total of 83 financial auditors and 82 IS audit specialists participated in an experiment in which “system type” was manipulated as either ERP or non-ERP. All participants were CPAs.

The results showed that financial auditors were significantly less concerned than IS audit specialists with the following heightened risks of the ERP environment in the experimental case: business interruption, network security, database security, application security, process interdependency and overall control risk. Additionally, financial auditors did not recognize the heightened risks of a seeded control weakness. Financial auditors were also highly confident in their ability to assess risks in both ERP and non-ERP environment; however IS audit specialists were less confident in financial auditors’ abilities to recognize unique risks posed by ERP systems. Finally financial auditors were unlikely to engage the services of the IS risk management practice within their firm to assist in assessing computer system risks in an ERP system environment, suggesting that potential financial statement and audit risks may go unidentified.

Nevertheless, the results of Brazel and Agoglia’s study (2007) showed among others that auditors were sensitive to the competence of CAS and assessed control risk higher when provided with positive control testing from a CAS with low (versus high) competence. Another major finding was that in the AIS setting indicative of increased risk, auditors with higher AIS expertise assessed control risk as higher than those with lower expertise.
Expectations of both groups (IS auditors and financial auditors) concerning the impact of IS audit findings on the scope of financial audit are difficult to assess. Computer audit specialists can recognize and assess much better audit risks in an ERP environment than financial auditors. In addition, financial auditors are confident that they can assess risks in both ERP and non-ERP environment, however IS audit specialists are less confident in financial auditors’ abilities to recognize risks posed by ERP systems. Finally in the literature it is mentioned that auditors are not apt to recognize heightened inherent and control risks and that auditors with higher perceived ERP systems expertise are better able to use IT audit specialists and plan the scope of substantive procedures to mitigate ERP system related risks.

We conclude that auditors, who possess higher AIS expertise, tend to assess control risk higher, compared to auditors with less AIS experience. This shows that financial auditors lack in recognizing the control risk importance in complex AIS environments and that they may be overconfident about their assessment results or their capabilities.

3.3 Control-audit procedures and ERPs

Messier et al. (2004) conducted a survey in the six largest public accounting firms in Norway. The purpose of their survey was to examine if information technology (IT) affects the audit procedures used by auditors in detecting misstatements and if the causes of misstatements detected on audits are different for computerized or non-computerized business processes. In order to collect data, they used a detailed questionnaire concerning auditor detected misstatements and related circumstances.

The results showed that (considering the effect of IT), tests of detail and attention directing procedures were just as likely to identify the misstatements in both computerized and non-computerized business processes. The authors mention that the primary reason auditors did not rely on IT controls was their belief that substantive testing was more efficient or effective. They found that there is an increase in the cause of misstatements resulting from missing and poorly designed controls. They also found that appropriate controls were judged to be missing more often in computerized rather than non-computerized business processes. Comparing their results with previous research they conclude that control problems increased generally in the last decade, but these problems are more prevalent in computerized business processes. Summing up, they mention that due to an increase in IT, there has been some degradation in the control environment and increase in the workload of accounting personnel. One consequence appears to be a shift in the audit procedures to detect misstatements to the use of more tests of detail.

In addition, Yang and Guan (2004) stated that the evolution of technology and the use of computers in business practice result in more information technology (IT) auditing and internal control standards and guidelines to assist auditors in their roles and responsibilities. Their paper focuses on the discussion of the IT audit
standards issued by the AICPA (American Institute of Certified Public Accountants) and ISACA (The International Federation of Accountants and the Information Systems Audit and Control Association) and their significance for the auditing profession. They mention that the auditors should understand very well these pronouncements, standards and guidelines when performing an IT audit and it is certain that in the future we will see more announcements in this area.

After discussing and describing these standards and guidelines they present their conclusions, stating that the introduction of data processing equipment has many impacts on the traditional manual accounting systems. They mention that IT systems require that the recording and processing functions be concentrated in departments that are separate from the origin of the data. They mention also that computerization has also reduced substantially the time available for the review of transactions before their entry into the accounting records. And as a result, in poorly controlled systems the opportunity for discovering errors before they have an impact on operation has been reduced, which leads to the increased importance of internal control procedures. Finally, they pointed out that computerization could potentially eliminate the audit trails by which individual records can be traced to final reports or to the original transaction.

Another important study concerning control procedures and the factors which affect them, was the one which was conducted by Grabski and Leech (2007). They pointed out that ERP implementation projects are but another example of an information system development project that needs to be controlled, and that the implementation of an ERP system is significantly different than a traditional system implementation. They focused on the fact that -as previous research showed- single modes of control are not sufficient, and that a portfolio of control modes should be utilized. This was explained through the theory of complementarity. Chief Information Officers (CIOs) and Internal Auditors were selected to be the participants in this study. A questionnaire was created and distributed to them. The questionnaire was specifically expanded and significantly modified to include the controls identified as important in the literature and it also included questions specific to internal audit activities during the implementation phase. One of the main findings of this study was that groups of complementary controls need to be employed in the implementation of ERP systems to achieve successful implementation.

In conclusion, control procedures are very important in order for data distribution and process to be reliable and for audit procedures to be successful. The latter is due to the fact that in computerized environments, many errors may become unidentified, unless efficient internal controls are present.

3.4 ERP and compliance with regulations

In this section we refer to three studies that have to do with ERPs and their compliance with the Sarbaney-Oxley Act. In a study concerning the impact of
SAS No. 94 on computer audit techniques, Cerullo and Cerullo (2003) classified computer-assisted audit techniques in three broad categories: 1) auditing around the computer, 2) auditing with the computer and 3) auditing through the computer. They examined the way auditing was processed in a firm which used an integrated Business Works ERP accounting software package to automate a variety of accounting applications. The audit manager of the firm, considering SAS No. 94 requirements, decided that it was critical to determine if significant internal controls—edit routines and programmed checks—had been incorporated into the Business Works software package sufficiently to address the relevant risks associated with initiating, recording and processing journal entries. The authors in their conclusions mention that SAS No. 94 provides specific guidance when a significant amount of financial information supporting one or more financial statement assertions is automated by complex electronic IT. Under these circumstances, the auditor must assess control risk by performing tests of controls, regardless of firm size. They also state that auditing through the computer techniques, such as data, parallel simulation or embedded audit module, should be used to test controls when a firm has sophisticated IT systems. The test data technique is recommended for auditors with little IT experience.

Additionally, Brown and Nasuti (2005) conducted a study-report and their purpose was to provide background for senior and middle management in IT organizations who may be in the implementation phase of compliance for Sarbanes-Oxley (SOX), and moreover to accountants, internal auditors and academics who wish to evaluate the impact of SOX on the IT organization. The sections of their report were: SOX and IT governance, ERP systems: recurring themes, after the initial implementation of SOX, frameworks to support SOX compliance, IT governance and SOX: where we go from here, to best practice and competitive advantage and conclusion. They concluded that competencies in several related core disciplines including project management, change management and software integration should be the top priority for SOX implementation. Moreover, they supported that enterprise architecting and related areas such as security and outsourcing can be managed more effectively with the appropriate competencies.

In addition, Maurizio et al. (2007) published a study which reviewed factors and methods used to integrate multiple ERP systems to comply with the Sarbanes-Oxley Act in an Enterprise Application Integration Environment (EAI) focusing on the SAP business warehouse application. They examined earlier research, surveys, actual processes and documentation defined in the SAP system as well as information gathered developers, auditors and compliance experts. They started mentioning that today, with the introduction and implementation of the Sarbanes-Oxley Act (SOA), enterprise systems are seen as essential for corporations to be able to achieve SOA compliance.

Based on their research, they found that to comply with the SOA it is advisable to look at the area of EAI for assistance. Compliance with SOA is a demanding task which needs the use of some portions of an EAI concept to become possible. The challenge of configuring a landscape to comply with the SOA without EAI means that the most of the links would be interfaces versus integration. The Business Warehouse systems (BW) have been available for over five years and the
progress to offer additional functionality to address SOA requirements is an ongoing activity. Landscapes need to be simplified from multiple systems environments to as few servers as possible. They also found that the authorization functionality in the Online Application Process (OLAP) Environment is not as enhanced as it is in an Online Transactional Processor (OLTP) system, and this is due to the differences in the two systems approaches to data. Data in an OLTP system is used for daily postings and processing, while data in an OLAP system is used primarily for reporting and viewing. The introduction of SOA changed that area and additional authorization processes need to be applied to reflect that change. The ability to post from BW to R/3 has made the use of authorizations in BW a must. They mention that there are many applications based items that have been affected by SOA, for example risk management, balanced scorecard, business planning, management of internal controls, BW based consolidations, core SAP, etc. These applications are much more mature and consistent with the needs of the corporations and auditing requirements. They continue mentioning that as companies realize that an EAI system is necessary to comply with SOA, more information and requests are voiced to help with enhancing the systems and business portion for the auditor of a data warehouse system.

Furthermore, Chang et al. (2008) published a study which aimed to achieve 3 purposes: The first was to explore the crucial control items of the purchasing and expenditure cycle in meeting the conditions of SOA 404. The second was to develop a computer auditing system based on the recognized control items and requirements of SOA 404 and the third was to validate the applicability of the system using an ISO/IEC 9126 model in meeting organizational needs. The development of the computer auditing system in this study showed eight proposed activity constructs and 34 control items in the purchasing and expenditure cycle, which are necessary for system development. The researchers established then this system on two chosen public firms to validate the applicability of the system. The interview results agreed on the usefulness of the system to facilitate their company internal control. It was found that the system can provide management and external auditors with the ability to identify incorrect financial statements and fraudulent activities. The computer auditing system complied with SOA 404. Furthermore it improves the correctness of the auditing activities, thereby increasing the reliability of the company’s investment and management environment.

4. Discussion and conclusions

Since the use of computers in data processing has become so widespread, auditors have had to conduct audits in IT environments. It is well known that information systems have a great impact on information management and business process redesign (BPR). When implementing information systems, enterprises re-engineer both their business processes and their employees, in order to have a competitive advantage. And as long as ERP systems have impact in almost all business processes, they have impact on the auditing process as well.
From our literature review it is obvious that ERP systems significantly change the auditing procedure of an organization.

Due to the fact that corporations tend to increase the number of their enterprise systems, the auditing process is being transformed. The role of auditors changes along with the audit process, as they are asked to broaden their knowledge as far as the information systems are concerned, in order for them to be able to complete successful IS environment controls.

Recent accounting research has shown that, in ERP system settings auditors are not apt to recognize heightened inherent and control risks, and that auditors with higher perceived ERP systems expertise are better able to use IT audit specialists and plan the scope of substantive procedures to mitigate ERP system related risks (Hunton et al., 2004, Brazel and Agoglia, 2007).

Also, it is more important for auditing in an ERP environment, that the auditors know how to use the information provided by the system, and less important the audit experience that they have (POB, 2000; Brazel, 2005; Chang et al. 2008). In detail, the POB states (p.171): “Auditors also will find that they must expand their technological knowledge and skills, devise more affective audit approaches by taking advantage of technology, and design different types of audit tests to respond to new business processes. Highly skilled technology specialists will become even more essential members of audit engagement teams”.

Expectations of both groups (IS auditors and financial auditors) concerning the impact of IS audit findings on the scope of financial audit are difficult to assess. Computer audit specialists can recognize and assess much better audit risks in an ERP environment than financial auditors. In addition, financial auditors are confident that they can assess risks in both ERP and non-ERP environment however IS audit specialists are less confident in financial auditors’ abilities to recognize risks posed by ERP systems. Finally in the literature it is mentioned that auditors are not apt to recognize heightened inherent and control risks and that auditors with higher perceived ERP systems expertise are better able to use IT audit specialists and plan the scope of substantive procedures to mitigate ERP system related risks (Bagranoff and Vendrzyk, 2003 Hunton et al., 2004; Brazel, 2005; Brazel and Agoglia, 2007).

We also point out that IS auditors and financial auditors should cooperate and work together as one team. Further research is needed to examine the differences in perceptions and the conflicts between financial auditors and IS auditors. (Vendrzyk and Bagranoff, 2003; Hunton, 2004).

Furthermore, control procedures are very important in order for data distribution and process to be reliable and for audit procedures to be successful. The latter is due to the fact that in computerized environments, many errors may become unidentified, unless efficient internal controls are present.

We also conclude that auditors, who possess higher AIS expertise, tend to assess control risk higher, compared to auditors with less AIS experience. This shows that
financial auditors lack in recognizing the control risk importance in complex AIS environments and that they may be overconfident about their assessment results or their capabilities (Hunton 2004; Brazel and Agoglia 2007).

We should mention at this point that AIS expertise plays an important role in complex AIS environments, in order to have successful auditing. As Brazel (2005) states “it may be preferable to assign a less experienced auditor with an ERP systems background to an ERP systems audit environment than a more senior auditor who may lack this domain of experience”. In conclusion, the information provided by the ERP system during auditing plays an important role. The latter role is more significant than the presence of an experienced auditor.

5. Limitations

Although considerable attention was given to the method and design of the literature review some limitations exist. First, some relevant publications might have been overlooked. Much literature has been scanned by reading the title only. Although the title in most cases describes the content quite well this is not always so. In order to be able to conduct a comprehensive literature review the topical focus was kept relatively narrow on auditing and ERP systems. This might be a regarded limitation since this literature review will not satisfy the need of readers looking for a review on accounting in general and Integrated Information Systems (IIS) as a whole- not only ERPs.

6. Directions for future research

In the previous section research on ERP and auditing has been reviewed. Many suggestions for future research can be identified on the basis of the literature review. This section will draw attention to a limited number of research opportunities that seem to be the most promising areas of future research. Further research is needed concerning the relation and interaction between auditing and ERP systems and the impact of ERPs on the auditing procedures and on the auditors’ role.

From the literature review it is obvious that IS auditors and financial auditors differ in perspectives and this leads to potential organizational conflicts. More research is needed in order to understand these differences and determine how best to resolve them so that financial and IS auditors work together to improve audit practice.

Moreover, Future research could examine the relationship between the complexity level of corporations’ AIS and measures of audit quality. Researchers should also examine the implications for audit efficiency and effectiveness of either allocating
additional internal control testing to CAS or providing auditors with greater training in evaluating IT risks. Studies could also suggest ways in which to improve the CAS/auditor relationship.

Nevertheless, the audit expertise literature has shown that experience and training combine to create expertise in auditors. Still, more dimensions of ERP expertise, such as ERP implementation knowledge, may be relevant to determining perceived auditor ERP systems expertise. Future research investigating auditor interactions with ERP systems may uncover such additional sources of expertise.

References


