

Enterprise systems and the re-shaping of accounting systems: A call for research

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Abstract

Enterprise systems (and their primary form, enterprise resource planning systems (ERPS)) have fundamentally re-shaped the way business event data is collected, stored, disseminated and used. This change in information processing orientation fundamentally affects every area of accounting and should drive radical changes in audit processes. Yet, the extant research in accounting has largely ignored this phenomenon and researchers have provided little of value in offering guidance to the respective practice communities through empirical findings. It is the editorial team at IJAIS's desire to promote the extension and growth of the enterprise systems research in accounting and the impact it has had and will have across the various disciplines of accounting. This issue of the journal is the first in a planned series of annual special issues on the role of enterprise systems in accounting.

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1. Introduction

While enterprise systems (also commonly known as enterprise resource planning systems (ERPS)) have become the norm in the business environment and vendors have experience maturity in sales of such systems, the accounting research community has largely ignored the impact such systems have on all facets of business organizations. To a large degree, the power of enterprise systems and the embedded tools and structures have allowed organizations to focus on increased globalization, outsourcing of core functions, and restructuring of business processes and trading

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partner relationships. Yet, these phenomena have been largely ignored by the accounting research community and the vast majority of the on-going research ignores the fact that enterprise systems have changed the environments in which we focus our research.

There is a slowly evolving and growing literature on enterprise systems and accounting that has largely been driven by European and Australian researchers applying research methods that are scantily used by North American and Asian researchers. This broader view of research methods has facilitated exploration of the basic phenomena that arise in enterprise system-driven environments. However, the application of these research methods have generally failed to meet the standards expected by journals aligned more with traditional North American accounting research methods. A middle ground is needed where the traditional North American researchers recognize the need to bring their own research skill sets and adapt them to the discovery level research that is needed in enterprise systems, while field researchers (and particularly case researchers) need to recognize the need for more externally valid research strategies. While discovery of how given individuals in a selected organization have been impacted by and have adapted to enterprise systems is of value, the major contributions to the enterprise systems in accounting research will come from research that presents findings that are applicable to a broad range of organizations and these are the findings that will be of interest to the readers of a journal such as the *International Journal of Accounting Information Systems* (IJ AIS).

Evolution of the discipline mandates the acceptance and use of a wide range of research methods in a rigorous (but not to the degree of rigor mortis) fashion in order to get a broad range of views and understanding as to the impact of enterprise systems. While the extant research lacks depth, one encouraging sign to date is the broad diversity of the set of studies that have been published in *IJAIS*. Dillard et al. (2005) provide a critical theory view of enterprise systems and the role in controlling individuals and the organizational structures within which they operate. Poston and Grabski (2001) and Nicolaou and Bhattacharya (2006-this issue) provide an empirical archival view on the impact of enterprise systems on organizational effectiveness, while Rikhardsson and Kræmmergaard (2006-this issue) provide an alternative view on performance and effectiveness via the use of multiple case studies. Nicolaou (2004) similarly uses a multiple case methodology, but the end result of this study is the development of a construct for measuring post-implementation review that can be applied in other future studies. Bradford and Florin (2003) use a questionnaire-based methodology to enhance the understanding regarding the diffusion of enterprise systems technology and user perceptions on the success of implementation. Other research related to design science and modeling of enterprises (e.g. McCarthy and Geerts, 2002) along with behavioral research investigating users aptitude to such models (e.g. Dunn and Gerard, 2001; Dunn and Grabski, 2000; Dunn et al., 2005) can also be perceived as adding to the overall body of research on enterprise systems in accounting. Thus, in a short time the research domain has benefited from the diversity that has sprouted at its basic foundation.

From a methods standpoint, the future looks bright if the momentum can build in regards to the evolution, growth and expansion of enterprise systems research. Yet, very little of this research has explored the behavioral aspects of enterprise systems (with notable exceptions aforementioned) and this is an area that many AIS researchers are well-prepared to tackle. Arnold's (2006-this issue) paper on opportunities for behavioral accounting research in enterprise systems should be particularly enlightening in this regard. Equally important, Arnold specifies desirable approaches in field research related to enterprise systems and it is intended from this point forth that her prescriptions will be relied on heavily by authors and reviewers for *IJAIS*.

From a discipline oriented perspective, the future also looks bright. There are many opportunities across the multiple sub-disciplines of enterprise systems in accounting from which researchers can

contribute to the overall understanding of the enterprise systems environment. In the following sections, these are briefly touched upon not as a comprehensive list but as examples of how the various aspects of enterprise systems and accounting might be explored.

2. Financial accounting

Enterprise systems change the financial accounting environment substantially as the processes used to record, assimilate and distribute such information all radically change. The recording process for transactions can generally be traced back to such individuals as a production worker on an assembly line, a warehouse worker at a receiving dock, or a cashier each scanning a bar code that captures the data and triggers the update processes that form the basic financial accounting records. Similarly, financial reports no longer need to be constructed by a set of accountants, but rather the procedures are encoded into the enterprise system to automatically generate the financial reports and make them available to decision makers. Even the process for making closing entries and closing out the books at the end of the period is becoming ever more automated with companies such as Cisco Systems reporting closing processes that take hours rather than days (Sutton, 2000).

The challenges in financial accounting are now more issues surrounding the timely delivery of information as opposed to the processes for assimilating and refining reports. As enterprise systems evolve, the reality of continuous reporting becomes more likely. If we move to a continuous reporting environment, what information should be reported? Surely not mundane items like depreciation. How should it be reported? Certainly XBRL seems to hold promise as an enabling technology and enterprise systems are increasingly being designed to support automatic conversion of reports to XBRL. Should the database of the enterprise system be opened up to allow users access to disaggregated information? If so, are users left on their own to figure out how to re-aggregate the information? Should there be a set of pre-defined filters for extracting the data and if so, what should these look like? Should we consider how digital dashboard technologies often provided within enterprise systems software could be used to develop useable and useful digital dashboards for assessing and monitoring financial accounting information? There are lots of questions with very few answers.

3. Managerial accounting

Managerial accounting is the area that has been receiving the greatest attention in the evolving research literature particularly within the European research communities. A number of case studies have been completed that examine how enterprise systems impact managerial control environments and how management is able to retrieve and aggregate the information they need in this new environment. But, we really need to move to the next stage with the development of more generalized theories that help us to understand the phenomena in a more generalized fashion. Again, I point you towards Arnold's (2006-this issue) article that discusses increasing the depth of such research in a fairly detailed fashion.

Similar to the area of financial accounting, one phenomenon that is becoming quite clear is that the role of managerial accountants as the generators of cost reports is diminishing in value rapidly. Report generation is automatable and there is little value in humans doing such work. Rather, the role of the management accountant adds value in being able to sift through the vast data warehouses of information in order to understand patterns and changes that effect the organization's efficiency, effectiveness, and achievement of operational and strategic goals. Research tells us little, however, of

how prepared managerial accountants are for this new environment. The aforementioned studies on the behavioral effects of enterprise systems models along with studies that have examined users' proficiency at data querying (i.e., [Bowen and Rohde, 2002](#); [Bowen et al., 2003](#)) could greatly inform such research during design and execution. How effective are users at using online analytical processing (OLAP) tools? How effective are users at data mining within data warehouse contexts? How affected are managerial accountants using these new tools by the various heuristic biases that have been well-reported in the audit and psychology literature? Are new types of heuristic biases introduced by these technologies? Currently, we know very little about this decision environment.

4. Auditing and assurance

Perhaps what is best known about the audit and assurance environment is that auditors are generally adapting very poorly to the changes that have been brought on by enterprise systems. As noted previously, financial accounting transactions are largely captured through a non-accounting employee scanning a bar code and the remainder of the process is executed and completed by the rules embedded in the enterprise system. If the rules are wrong, the information generated will be wrong. However, there is little evidence that auditors provide any type of review of the manner in which these rules have been programmed and business events are actually being recorded. Systems reliability assessments must become a part of the audit, but how can auditors effectively execute such audits? What techniques and methodologies can and should be used?

Coupled with the earlier discussion on continuous financial reporting must be the associated existence of continuous auditing. It seems unrealistic and highly risky to move to a model of continuous financial reporting where assurance over that information is not provided. But how can continuous auditing be delivered in an enterprise systems environment? Early research has provided design science instantiations that demonstrate the capability to both monitor business process controls ([Alles et al., in press](#)) and to implement continuous monitoring over potential sources of financial transaction fraud ([Kuhn and Sutton, 2005](#)) in SAP R/3 environments. These instantiations demonstrate the capability, but they do not attempt to tackle the bigger conceptual issues of how such monitoring should optimally be completed, how completeness of the monitoring metrics can or should be determined, or even what are the core objectives of such systems. This is another area in great need of research.

Finally, it is difficult to consider audit and assurance issues in today's world without considering the impact of the U.S. Sarbanes–Oxley Act (SOX). While SOX is intended to help assure the reliability of systems of internal controls, it likely also has unintended consequences related to enterprise systems. Are more organizations being forced to convert legacy systems to enterprise systems in order to meet internal control requirements? Are less organizations willing to convert from one enterprise system to another due to the requirements to fully document both systems? Little is yet known about the impact SOX will have on enterprise systems selection, implementation and use.

5. Accounting systems

While to most readers, the previously noted areas are likely to all be considered accounting systems issues, there are certain issues that are more systems specific and should be considered. Namely, the research in intelligent systems to date has focused almost exclusively on stand alone decision aiding systems. Yet, in today's world, and in particular in enterprise systems environments, intelligent systems are increasingly being delivered as components of much larger systems. This has

significant ramifications for how such intelligent systems are adopted by users, relied upon by users, simply used, and the level of knowledge transfer to the user that is likely to take place. Similarly, how is knowledge transfer to the user affected when the knowledge is embedded in an underlying knowledge management system as opposed to being within an embedded intelligent decision aid? Or, versus being embedded in a decision analysis tool such as those used to mine data warehouses? Our research community needs to collectively step back and think about how the contemporary enterprise systems environment has changed the environment in which our research is conducted.

6. Concluding comments

Enterprise systems have radically changed the business environment as well as other organizational environments that are of great interest to the broader accounting research community. Researchers have been slow to evolve our research programs to tackle this new environment. There is a great need for more enterprise systems research and it is the intent of the editorial team at *IJAIS* to foster research in this area.

The opportunities are abundant and the need is great. We hope that the research community will embrace this changing environment and add to the relevance of our research as we pursue an agenda of understanding the impact of enterprise systems, the desirable methods for addressing enterprise systems integration, and primarily enhance our understanding to the point that we can provide leadership to organizations in the ethical and value enhancing application of enterprise systems technologies.

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