Enterprise resource planning (ERP) systems implementation and internal audit function change

Hany Elbardan
Maged Ali

Follow this and additional works at: http://aisel.aisnet.org/ecis2011

Recommended Citation
http://aisel.aisnet.org/ecis2011/196

This material is brought to you by the European Conference on Information Systems (ECIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2011 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
Abstract

The economic crisis and the financial scandals highlight the significance of corporate governance. The internal audit function has gained great attention for assuring good corporate governance. ERP systems significantly change the information processing environment in organisations and act as a means of corporate governance change.

ERP systems have embedded structures and institutional logics which could conflict with the corporate governance institutional logics in use. The internal audit function should be changed in terms of practices and structure to maintain its legitimacy as a corporate governance tool that adds value.

In this paper, the authors articulate institutional theory to formulate a primary conceptual framework to explore how does the internal audit function respond to the misalignment between the ERP systems institutional logics and the corporate governance institutional logics. Internal auditors can respond to the misalignment with acquiescence, compromise, avoidance, defiance or manipulation strategies. This conceptual framework will be validated by conducting two case studies in Egypt and two in the UK in the banking sector.

Keywords: ERP, Internal Audit, Corporate Governance.
1 Introduction

Corporate governance creates heated debate since noticeable failures of accountability have been highlighted by the financial scandals and the economic crisis. Certainly, the internal audit function has attracted the attention of boards those face external pressure for assurance about corporate governance practices. Internal auditing is receiving attention unlike ever before (Carcello et al., 2005). The global emphasis on the need for sound corporate governance has caused an increasing interest in the internal audit function (Goodwin and Yeo, 2001).

One of the important innovations in the world of IT has been Enterprise Resource Planning (ERP) systems. The implementation of ERP systems requires organisational business process reengineering. This implies new ways for designing tasks, jobs, communications within the organisation and leads to new work structures and procedures (Kallinikos, 2004). ERP systems create new opportunities as well as new challenges to the overall focus of the internal audit function (Saharia et al., 2008). Therefore, the internal audit function must be adaptable and creative. According to institutional theory, failing to be equipped to respond to new challenges will lead to legitimacy problems (Power, 2003). Institutional theory (Powell and DiMaggio 1991; Oliver, 1991) offers a suitable base to analyse the misalignment among institutional logics and to analyse strategic responses to institutional pressures.

Because of ERP system’s sophistication and highly integrated nature, it has great potential to reshape the internal audit function structure and practices (Avgerou, 2001; Barrett et al., 2001). Internal auditors have a number of potential strategies in responding to the new institutional logics and pressures. Understanding potential conflicts is essential to analyse internal auditors’ responses to new ERP systems. This suggests that internal auditors’ response to an ERP implementation will be more pluralistic than a singular response that is often characterized in the literature (Madani, 2009; Saharia et al., 2008).

The internal audit function has significantly changed to cope with evolutions in corporate governance (Bailey et al., 2003) as well as IT evolution (Allegrini et al., 2006). However, it remains an ongoing challenge for the internal audit function to prove their added value to organisations through improving corporate governance in the extensive IT environment.

The paper is structured as follows: first, a discussion of the background literature is provided; then an overview of the conceptual framework is highlighted; last but not least, conclusions and future research are drawn.

2 Research Background

ERP systems pose new risks and challenges to internal control. ERP systems could change the internal audit function structure and practices. In the following four sections, the authors will explore how the ERP systems implementation acts as a catalyst for the internal audit function change, by affecting the internal control and risks within the organisation.

2.1 Internal audit change

The internal auditors execute governance related activities. These activities include: risk assessment, control assurance, compliance assessment and consulting services (Gramling, 2005). The internal audit structure and practices undergoing changes have been broadly acknowledged in the literature (e.g. Carcello et al., 2005; Nagy and Cenker, 2002; Robson et al., 2007).

Increasing public interest in corporate governance, particularly the changing concept of internal controls (IFAC, 2006), has driven organisations to review their expectations of the internal audit function. Moreover, with the development of risk management as an integral aspect of corporate governance,
changes have taken place in internal auditors’ roles. The wider approach of internal control offers the internal audit function the opportunity to claim expertise in the area of risk management. As a result, the importance of the internal audit function as a key component of good corporate governance has increased (Spira and Page, 2003).

It cannot be ignored that the overall risk-control landscape affects the internal audit function. The risk-control landscape is affected by ERP systems implementation. Consequently, the internal audit function will need to be remodelled. Its relationship with all other parties will also be affected (Paape et al., 2003). Some studies find that internal auditors have lost control of their traditional role as evaluators because this role is now built in to IT and their auditing knowledge has become easily transferable to information systems staff (Spathis and Constantinides, 2004). Others suggest that internal auditors not only continue to do their traditional function but are also expanding their role into other functional areas (Bierstaker, 2001; Lightle and Vallario, 2003; Madani, 2009).

Prior studies tend to agree on the occurrence of change but not the nature of change (Bierstaker, 2001). No clear indication has been revealed of how ERP systems implementation changes the internal audit structure and practices in order to enhance its legitimacy. To investigate how ERP systems change the internal audit function, it is necessary to explore how these systems affect internal control and risks within organisations. This will be highlighted in the following sub-sections.

2.2 ERP systems change the internal control

ERP systems eliminate human interaction with data flows; thereby they enhance the security, accuracy and integrity within organisations. As a result, the transparency in business processes is increased. While the internal control objectives remain the same, the mechanisms of control are changed (Madani, 2009). ERP systems bring changes to internal control, business process and segregation of duties (Hunton et al., 2001; Wright and Wright, 2002). ERP systems affect many control issues such as control planning and monitoring, authorizations, user authentication, time restriction, integrity of data, reconciliations and segregation of duties (Sia et al., 2002).

It has been proposed that full automated ERP systems enhance control through more transparency across the whole business process. Therefore, they facilitate matching of documents and make individuals’ actions visible. As the system depends on one centrally controlled database, privacy violation can be controlled more easily (Orlikowski, 1991). However, ERP control has become a popular subject in the audit profession (Wright and Wright, 2002), which means that there are a lot of related problematic issues.

On the one hand, ERP systems tighten internal control. O’Leary (2000) asserts that ERP enhance control through standardized and accessible information that makes any deviation visible. On the other hand, the business practices which are embedded in the ERP and the resulted transparency simultaneously give more power to employees, greater control relaxation and more job discretion than their functional needs (Elmes et al., 2005). However, there is not much research on the needed changes in the internal audit function to assure internal control within ERP-based organisations in order to enhance its legitimacy.

2.3 ERP systems change the risk

The complexity of ERP integrated systems generates additional risks. An error introduced in one part of the system can disrupt the whole business operations (Saharia et al., 2008). Moreover, O’Leary (2000) argues that the interdependent nature of ERP system applications exposes organisations to significantly different risks. These unique ongoing risks include business interruption, process interdependency, privacy and confidentiality, data content quality and system security risks. There have been many studies that concerned with ERP system risks (e.g. Aloini et al., 2007; Scott and vessey, 2002), which agree that ERP systems are risky from different perspectives.
It is important for internal auditors to be aware of the unique risks associated with ERP systems in order to plan and execute an assurance function. However, the changes needed in the internal audit function to help in risk management have been overlooked in ERP systems environment. Therefore, it is important to investigate how the internal audit function should change to maintain its legitimacy.

### 2.4 ERP systems and internal audit function change

ERP systems present new challenges and opportunities to the internal audit function (Hunton et al., 2001; Wright and Wright, 2002). ERP systems are sophisticated and highly integrated. They have the potential to greatly influence the internal audit function structure and practices (Avgerou, 2001; Barrett et al., 2001). Chen (2009) suggests that ERP systems should be considered not only as an IS, but also as an important part of the corporate governance system.

The traditional internal audit function will not be sufficient after ERP systems implementation (Madani, 2009). The traditional boundaries of internal auditing are challenged. ERP systems complicate the internal audit function (Saharia et al., 2008). Due to the real-time nature of ERP systems many internal auditors may not be well prepared to accomplish their governance mission.

On the other hand, ERP systems have led to a significant shift in the overall focus of the internal audit function. Internal audit professionals are developing a broader role for themselves. They are being in charge of less data checking and more consultation work. Several assignments have been eliminated. At the same time internal auditors’ capabilities have been expanded (Saharia et al., 2008). That induces high costs and requires skills other than those needed for a standardized basic service (Paape et al., 2003). Internal auditing role is proactive and on-going.

The auditors need to expand their skills to perform effectively and efficiently in the ERP environment. Otherwise, internal auditors may have to face the erosion of their preserve by other competing professional groups. Spathis and Constantinides (2004) examine the changes brought by implementing ERP systems in the accounting process. The results have revealed that the only notable change in accounting practices is related to the increased use of the internal audit function.

The insights gained to date have a number of limitations: Firstly, there have been no previous studies that address the internal audit function change as a response to ERP systems implementation.

Secondly, auditing research has stayed relatively away from trying to be understood in its social context, particularly in terms of theoretical and empirical analysis of contemporary internal audit practice (Robson et al., 2007). Auditing research has stayed away from addressing the internal audit strategic response to the misalignment between the ERP institutional logics and the corporate governance structure in use, especially using the institutional theory perspective.

Thirdly, previous studies ignore the fact that ERP built-in best practices are derived from companies working in developed countries. Hence, it is not necessarily the case that best practices from other contexts are appropriate for developing countries.

Fourthly, previous studies acknowledged the levels of analysis existing in institution theory: field, organization, sub-organization and individual. However, while studies at the organizational level of analysis form the majority studies, there is a room for IT contributions at organizational sub-systems levels of analysis such as groups, departments and processes (Mignerat and Rivard, 2005) as the internal audit function. Organizations that respond to the ERP system implementation are conceived as singular actors, where the institutional forces embodied by the system are not in alignment with all the functions within the organization (Soh and Sia 2004; Gosain 2004). Organizations encompass multiple and nested institutional logics, so there is a need to go profoundly beneath the view of an entire organization's adaptation and focus on specific responses associated with particular routines (Yoo et al., 2007) as the internal audit function.
Finally, none of the past studies has looked at the ERP impacts on auditing in commercial banks, which almost have mandatory governance rules and put great emphasis on internal auditing. Most of the previous research has focused on addressing the changes in external auditing, while very few are driven by internal auditing perspective.

3 Conceptual framework

Institutional theory (DiMaggio and Powell, 1983) suggests several routes by which institutional change leads to shifts in organisational structure. Once in place, the new institution, such as ERP systems, can change work roles and activities, which require substantial modifications of the function’s existing technological base (Barley, 1990). In addition, institutional theory offers theoretical perspectives to analyse goals, values and prescriptions that legitimate behaviours of groups (Powell and DiMaggio, 1991) such as internal auditors. New technologies first alter tasks and skills then these changes generate opportunities and pressures for changing organisational structure (Barley, 1990). The paper argues that ERP systems have embedded institutional logics which are significant catalysts for the evolution of the internal audit function.

Each institution can be characterized in terms of the ‘institutional logic’ of its structures (DiMaggio, 1997). DiMaggio (1997) views that logics conflict comes from applying inconsistent cognitive schemata simultaneously to the same situation. ERP systems embody specific institutional logics and corporate governance has institutional pressures both could misalign with the internal audit function. Therefore, it is important to investigate the internal audit function response. Figure 1 demonstrates the primary conceptual framework to the internal audit function change as a response to ERP systems implementation.

3.1 ERP as an institution and potential misalignment

IT has been characterized as a trigger for organisational structuring (Barley 1986), as a carrier of institutional logics (Scott 1995) and as a form of institution (structure) in itself (Orlikowski 1992). Institutional logics define the norms, values and beliefs that structure the cognition of actors in organizations (DiMaggio, 1997). ERP systems embody institutional logics which act as a template for the performing of the organisation’s activities. ERP systems are “important embodiment of institutional commitments and serve to preserve these rules by constraining the actions of human agents” (Gosain, 2004, p.151). ERP systems embody institutional logics of the organisation’s activities, which enable some activities while denying legitimacy to others (Gosain, 2004). Moreover, Avgerou (2000) considers ERP system as an institution that justifies and enacts organisational change. ERP systems imply several assumptions about how organisational processes should work, however the fit to organisational needs is often lacking.

ERP systems can be seen to represent a particular rationalized logic, structure or procedural focus. The principles associated with ERP systems are control and efficiency. These objectives are achieved through standardization, visibility, best practice and integration. ERP systems are provided with assumptions inherited from reference industries, countries and managerial interests, which reflect the identity of bureaucratic and hierarchical administrative practices (Yoo et al., 2007). The institutional logics associated with ERP can be summarized in table 1, as follows:
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Characterization of ERP’s logic</th>
<th>Selected sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles</td>
<td>Efficiency and control.</td>
<td>Ciborra, 2000; Hanseth et al., 2001; Davenport, 1998; Sia et al., 2002; Newell et al., 2003; Kallinikos, 2004; Boudreau and Robey, 2005; Allen, 2005</td>
</tr>
<tr>
<td>Assumptions</td>
<td>Efficiency through standardization and integration. Control through visibility.</td>
<td>Robey et al., 2002; Davenport, 1998; Markus et al., 2000; Markus and Tanis 2000; Soh et al., 2000; Boudreau and Robey, 2005; Wagner and Newell, 2004; Elmes et al., 2005; Sia et al., 2002; Allen, 2005</td>
</tr>
<tr>
<td>Identity</td>
<td>Top-down structure implies rationalized bureaucracy in line with functional managerial interests; user discipline.</td>
<td>Davenport, 1998; Soh et al., 2000; Pollock and Cornford, 2004; Boudreau and Robey, 2005; Soh and Sia, 2004; Gosain, 2004; Webster, 1991</td>
</tr>
<tr>
<td>Domain</td>
<td>Highly explicit and repetitive administrative routines.</td>
<td>Davenport, 1998; Soh et al., 2003; Kallinikos, 2004; Markus and Tanis, 2000; Wagner and Newell, 2004</td>
</tr>
</tbody>
</table>

Table1. Institutional logic commonly associated with ERP (Adapted from Yoo et al., 2007)

ERP systems vendors draw on their view of the world, which is influenced by the institutional properties of their knowledge, resources and norms. Consequently, this is reflected in the structural features of the technology. The designers’ context may differ from the context of many other potential implementers (Avgerou, 2001; Barrett et al., 2001). Therefore, it is important to investigate the sources of contextual differences in each function that contribute to misalignments between the package and the different functions within the organisation.

Studies have documented the potential misalignment between the incumbent institutional logics and those embedded into ERP systems. Sia et al. (2002) define misalignments as “differences between the structures embedded in the organisation and those embedded in the package” (P.376). Soh et al. (2003) explore the misalignments between the structures embedded in ERP systems and the existing organisational structures. It can be anticipated that the institutional logics of ERP systems can conflict with those incumbent in the internal audit practices, which may not align to standardization, integration, rationalization and routinization. A conceptual framework is formulated (As shown in Figure 1) to analyse varying levels of the internal audit function responses to ERP implementation by drawing upon the institutional theory of Oliver (1991).

### 3.2 Corporate governance institutional pressures

The corporate governance regulations on internal controls constitute a formal pressure that can influence the internal audit function. These pressures are control mechanisms exerted on organisations to constrain their behaviour (Haggerty and Golden, 2002). Corporate governance as an institution is a social structure which provides professional groups guidelines of orientations, while controlling and constraining them. The constraints which are represented with institutions are called institutional pressures, as follows (DiMaggio and Powell, 1983):

- **Coercive isomorphism**: Coercion occurs through mechanisms of corporate governance guidelines, rules, laws and legitimation to change internal audit functions not only to assure internal control system adequacy, but also to engage in a wider review of the efficiency and effectiveness of the organisation’s activities, risk management and the overall organisational performance.

- **Mimetic isomorphism**: occurs when organisations recognize that the internal audit function change will contribute to an improvement in control and operational performance.

- **Normative isomorphism**: arises from an increase in internal audit professionalization within organisations.
3.3 Internal audit change to maintain legitimacy

Internal auditors have a number of potential strategies in responding to new institutional logics. Organisations need to be very aware of the conflicts between alternative institutional logics (Gosain, 2004). This is essential to analyse a range of typified internal auditors’ responses. Oliver (1991) proposes a whole set of legitimating strategies and tactics associated with them:

Acquiescence strategy is a conscious intent to conform. It is expressed through the tactics of habit, imitation and compliance; Compromise strategy is used when own interests are promoted through tactics such as balancing, pacifying and bargaining; Avoidance strategy is an attempt to prevent the need to conform to an external pressure using avoidance tactics such as concealing, buffering and escaping; Defiance strategy is the rejection of institutional norms using defiance tactics, which include dismissing, challenging and attacking; Manipulation strategy is the purposeful and opportunistic application of the tactics of co-opting, influencing, or controlling an institutional pressure. These strategies help to understand how legitimacy will be managed under institutional pressures.

The internal audit function discretion in the form of strategic responses is bounded by the institutions that gave rise to it. Therefore, responses to institutional pressures should be consistent with the existing institutions (Goodrick and Salancik, 1996). In order to determine the strategic response of the internal audit function to ERP systems implementation and the potential misalignment, the internal audit function structure and practices will be investigated in the future research.

The internal audit function structure characteristics include the internal audit function sourcing, budget, size and skills. Depending upon priorities and availability of resources some audits may need to be outsourced (Burnaby and Hass, 2009). The internal audit cost has become unavoidable in most organisations as a result of the complexity of recent IT and the increasingly important of the internal audit function as an effective corporate governance mechanism (Abdolmohammadi and Boss, 2010; Petter et al., 2008). To engage in more IT audits in the ERP system working environment the internal audit department size must increase (Abdolmohammadi and Boss, 2010). Consistently with the evolution in the role of the internal audit function within organisations internal audit professional bodies should re-design the skills those are needed for their profession (Arena and Azzone, 2009).

Figure 1. The primary conceptual framework for the internal audit change as a response to the ERP system implementation

The internal audit function practices include internal audit function scope of services, tools, position and relationship with the external auditors. The internal audit function scope of services has been expanded to
involves more activities. It no longer has a narrow focus based on evaluating internal controls (Cohen et al., 2004). The ability to perform more highly effective work using fewer resources is dependent on having the right tools and using them effectively. Attention should be paid to determine the internal audit position within the organisation since this can influence its effectiveness (Arena and Azzone, 2009). Process change represents an opportunity for groups to extend their knowledge basis to reinforce their professional legitimacy (Caglio, 2003). Changes in the internal audit function are likely to impact external auditors’ reliance decisions (Munro and Stewart, 2010).

Internal auditors have extreme aspirations and efforts aiming at revamping their legitimacy in consistent with corporate governance initiatives (Power, 2003) as well as with the new IT prevailed usage. Based on the institutional theory and the literature review the research question can be formulated as follows: How does the IAF change as a response to the corporate governance institutional pressures, the ERP systems institutional logics and the occurred misalignment in order to secure its legitimacy?

4 Conclusion and future research

The paper has proposed a primarily conceptual framework, which will be validated through in-depth case studies, to explore and interpret the ambiguous internal audit function change deriving from the implementation of ERP systems. By the aim of gaining full understanding, from an institutional perspective, of the internal audit ability to preserve its status as a value added function which improves the effectiveness of governance process.

Orlikowski and Barley (2001) suggest that “the transformations currently occurring in the nature of work and organizing cannot be understood without considering both the technological changes and the institutional contexts that are reshaping economic and organisational activity” (p.145). In order to investigate the transformation currently occurring in the internal audit function this paper considers both ERP systems implementation and the new technological tools used by the internal auditors as the technological changes, while using the corporate governance as the institutional contexts that are reshaping economic and organisational activity.

Emphasis here is to contribute to an understanding of the internal audit function change by highlighting the processes through which how developments within the internal audit function enhanced its legitimacy as effective corporate governance actor. Internal auditing activity is the outcome of complex conjunction of external and internal associated constituents. It is this constellation of connected elements that justifies a function level approach to the analysis of the internal audit function change.

The internal audit function change process can be viewed as a response to the new ERP systems. ERP systems constrain the activities of the organisation and shape the cognitive processes of internal auditors. It constrains corporate governance’s institutional forces that influence specific trajectories of the configuration of the internal audit function. Between these two main aspects is the resolution process of institutional misalignments through the strategic response to the institutional pressures.

The question is: How ERP systems implementation changes the internal audit function structure and practices in order to add value to the effectiveness of governance process? This will be explored in future multiple-case interpretive research.

References


