

Perspectives and Challenges for IT Governance

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Abstract

Information technologies play a key role in modern organizational structures. For example, they enable organizations to restructure operations and company resources (by using enterprise resource planning systems) or to reshape corporate boundaries through participation in global digital marketplaces. As a result, companies face the pressure of continuously investing in IT systems of ever increasing complexity thus exposing these systems to internal and external threats. It therefore becomes imperative to have the right auditing processes in place in order to minimize exposure to these threats while safeguarding the managerial and accounting benefits of IT investments.

In this article, we describe this link between new forms of corporate structures and auditing. After explaining basic terms and definitions of Corporate and IT governance, we discuss the near-standard COBIT framework of IT Governance. We then focus on business webs (b-webs), a distributed corporate structure based on Internet technologies, and we present its details through our B-web Transformation Model. Finally, the effects on IT Governance by the adoption of b-webs by corporations are analyzed and discussed based on a new auditing framework. The latter aims to track changes to auditing parameters and requirements as an organization evolves within our B-web Transformation Model.

Keywords: auditing, IT governance, business webs, COBIT, financial statements

1. Introduction

Information technologies (IT) play a key role in modern organizations. According to (Ramos, 2001), the continuous evolution of IT leads to a multi-faceted transformation path for both corporate structures and operational infrastructures. For example, companies experience transformations from isolated, locally focused operations to global firms that transact through e-business; or from using simple internal controls to implementing and strategically exploiting enterprise resource planning platforms and outsourcing.

As a result, there is pressure for continuous investments in IT systems of ever increasing complexity, in order to explore new ways of competing. This link between IT and corporate strategies is a key concern across business executives, as it increases their dependency on a function that was often considered to play a support role. (Boritz, 2005) and (Sohal and Fitzpatrick, 2002) further investigate this link by considering the strategic and financial implications of

IT investments. From the corporate strategy point of view, IT investments may constitute a sizeable component of corporate budgets. From the IT point of view, system complexity leads to risk exposure that could result in financial or moral damage or even damage of a company's reputation and client base. Such risks can be internal or external threats, including unintentional mistakes, malicious attacks, malfunctions or other shortcomings.

It therefore becomes imperative to develop the right auditing framework in the context of corporate structures that are transformed by technological discontinuities (e.g. e-business). Such a framework should aim to minimize risk exposure while safeguarding the managerial and accounting benefits of IT investments.

In this article, we describe this link between new forms of corporate structures and auditing. After explaining basic terms and definitions of Corporate and IT governance, we discuss the near-standard COBIT framework of IT Governance. We then focus on business webs (b-webs), a distributed corporate structure based on Internet technologies, and we present its details through our B-web Transformation Model. Finally, the effects on IT Governance by the adoption of b-webs by corporations are analyzed and discussed based on a new auditing framework. The latter aims to track changes to auditing parameters and requirements as an organization evolves within our B-web Transformation Model.

2. Corporate and IT Governance

Corporate Governance is defined as the total of operations and controls of an organization (Fama and Jensen, 1983) or as an overall structured system of principles (Dey Committee, 1994) according to which an enterprise operates and is organised, managed and controlled. The purpose of this system is to ensure the promotion of an organisation's collective interest as well as the unimpeachable character of its procedures. The goal is to have accurate and timely information about the internal and external environment. This should help firms be stronger and more competitive. While many laws, codes, committees and discussion groups have been working on corporate governance since decades, the collapse of a great number of companies, such as Enron, Global Crossing, Polaroid, Parmalat and others, acted as the shaking news that turned the focus upon corporate governance. The Sarbanes-Oxley Act of 2002 constituted a reaction against those facts that aimed at preventing any repetition of similar phenomena and stressed out the significance of corporate controls and auditing. It was the legislative key movement that signalled the beginning of a new audit culture. The Act includes a wide variety of measures that lay the foundations for a legislative approach of effective Corporate Governance by stressing out those issues that deal with control of financial information.

Many things have been written about the significance of the Sarbanes - Oxley Act and about internal audit in general. However, there are not many references to the significance of IT, even though financial reports are produced by IT systems. Such systems usually cover the input, authorisation, recording, execution and reporting of financial transactions. As such, they are directly related to the overall process of creating financial reports and should be assessed with the same attention paid to all important projects, according to the Sarbanes Oxley Act (ITGI, 2006).

IT Governance is a responsibility of both Board of Directors and Executive Management. IT Governance (ITG) consists of the leadership, organizational structures and processes for planning and organizing, acquiring and implementing, delivering and supporting, and monitoring IT performance (ITGI, 2003; Schwarz and Hirschheim, 2003). Its goal is to help business executives ensure that a company's IT infrastructure and information flows: a) are aligned with the company's corporate goals, strategies and profitability measures; b) can be assessed for incurring risks and mitigating actions.

In fact, the responsibilities of both Board Directors and Executive Management regarding IT have evolved and become even more complicated. This evolution of responsibilities took place from the level of estimating the impact of specific technology issues within an enterprise to the level of IT governance as the main source for achieving business objectives (Trites, 2004). Both Board Directors and Executive Management should become aware of their evolving role in terms of IT Governance, since their tasks depend on the information they receive (Hardy, 2006).

Hence, the need to strengthen IT Governance and closely relate it to Corporate Governance is assuming central role in today's business management. The Bank of International Settlements (BIS) recommends that company directors should address IT as an integrated item of their strategic agendas and not as a support function of business strategy. IT governance is critical and must be effective, transparent and accountable.

The bidirectional dependency link between Corporate Governance and IT Governance is explored by a number of researchers. (Shleifer, 1997; Van Grombergen, 2004) conclude that Corporate Governance issues cannot be settled without considering relevant IT Governance issues. For example, three of the main questions about IT Governance are the following:

- How do business managers get the CIO and IT organization to return business value to it?
- How do business managers make sure that the CIO and the IT organization do not mismanage their allocated budget or invest it in bad projects?
- In general, how do business managers control the CIO and the IT organization?

The above are actually sub-questions of three of the main questions regarding Corporate Governance:

- How do suppliers of finance get business managers to create value?
- How do suppliers of finance make sure that business managers do not mismanage the supplied capital or invest it in bad projects?
- In general, how do suppliers of finance control business managers?

3. The COBIT Framework

Putting IT Governance into action remains a challenging issue for business executives and IT experts alike. In a 2001 survey by (PriceWaterhouseCoopers, 2001), almost two thirds of the surveyed members of Boards of Directors do not feel comfortable answering questions concerning IT. They further consider that these questions should only be directed to their CIOs and/or their IT departments.

In a similar 2005 survey by (ITGI, 2006), almost three out of four companies do not examine IT-related risks on a regular basis. From the corporate managers' point of view, the reason for that should be sought in: a) difficult to comprehend technical descriptions of IT systems; b) mostly administrative/accounting approach to IT risks by business executives.

Beyond issues of understanding IT, organizational data moves between multiple business groups and IT systems on its way from initial transactions to the reports that senior executives must attest to. Attesting to the accuracy of the data requires confidence in accounting procedures and controls. These are addressed within corporate governance frameworks, such as COSO (Committee of Sponsoring Organizations of the Treadway Commission).

Attesting to the confidence in IT systems that house, move and transform data requires confidence in the processes and controls for those IT systems. To address the latter, a number of IT Governance frameworks have been proposed, with COBIT being the most widely accepted.

COBIT (Control OBJECTives for Information and related Technologies) is an open standard published by the IT Governance Institute (ITGI) and the Information Systems Audit and Control Association (ISACA). It is an IT Governance framework built in part upon the COSO framework.

COBIT helps business managers bridge the gap between control requirements, technical issues and business risks. A recent study by (ITG/PriceWaterhouseCoopers, 2006) showed that:

- The awareness and knowledge of COBIT has increased from 18% in 2003 to 27% in 2006. In addition, one out of seven executives surveyed said that they have a very good knowledge of that framework.
- The application of COBIT, according to those asked, is not an easy procedure and must be adapted to a company's particularities.
- One out of ten companies covered in the study use the COBIT framework. In addition, one out of three of the surveyed companies are "secret" users of COBIT - they either use parts of COBIT or use it as a foundation for their internally developed IT Governance framework.
- Almost half of COBIT users regard it as an important tool for IT Governance.

In terms of its capabilities, COBIT helps business managers have end-to-end control on IT through:

- Maturity models, for evaluating the current state of IT Governance in their organizations and benchmark it against best-practice principles and standards.
- Critical success factors, for determining key drivers of control on IT processes.
- Key goal/performance indicators, for assessing whether an IT process has accomplished relevant business demands.
- Activity domains, categorized as: a) plan and organize; b) acquire and implement; c) deliver and support; d) monitor and evaluate.

4. Implementation Challenges

Despite the development of frameworks and control models that help IT Governance happen, and beyond the encouraging survey results described above, there are still several implementation challenges to address.

First of all, current IT Governance frameworks, like COBIT, aim to define rigorous ways of control through heavyweight methodologies, resulting in implementations that may take a lot of time, effort and money before companies realize their investment payback.

In addition, such frameworks focus primarily on IT's internal processes. This is indeed necessary, in order to ensure that the IT function works effectively. However, there are certain drawbacks that may jeopardize successful implementation of an IT Governance model:

- The approach is too inward looking. It over-emphasises IT functional activities (such as ensuring IT staff are properly trained, or how well IT suppliers are monitored) at the expense of the IT deliverable - viable, working systems that deliver valuable business benefit
- It requires a reasonably high degree of process maturity. Without this, most organizations find it hard to understand and adopt a governance approach structured around processes
- It does not suggest where to direct action. It may identify, for example, that disaster recovery is generally weak and that testing is generally strong. But it does not highlight which systems actually need better disaster recovery, or which systems have weak testing. As a result, it tends to suggest broad "IT initiatives" rather than focussed individual improvements
- It makes little sense outside IT. In fairness to frameworks like COBIT, most of their measures are externally relevant system qualities or relate to the broader business. However, they present these measures structured around internal IT processes, and not around parameters the rest of organization understands.

We further believe there is an implementation parameter for IT Governance whose role is not fully understood: corporate structures and their continuous transformation.

Our research is focusing on understanding how changes in corporate structures may affect IT Governance and, in turn, auditing (see Figure 1). It is interesting to note that such changes are actually driven by technological discontinuities (e.g. internet-related technologies)

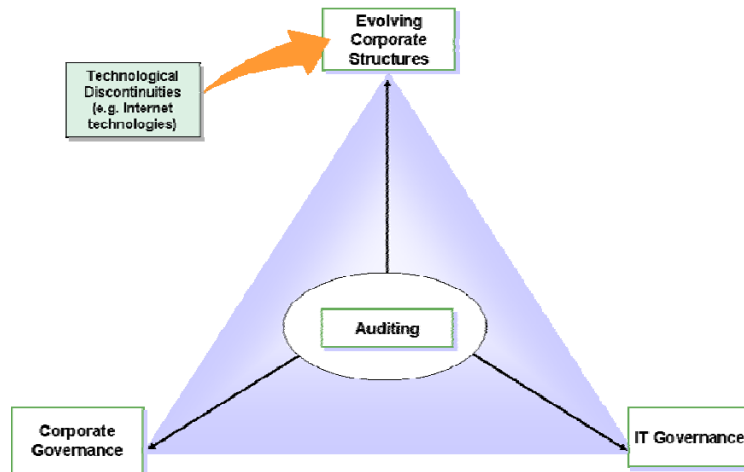


Figure 1: Key implementation dependencies for IT Governance

4.1 Evolving corporate structures - Business webs

For decades, the starting point for strategic, governance and auditing thinking has been the stand-alone, vertically integrated corporation. Companies prospered with this model of production because it was cheaper and simpler for them to perform the maximum number of functions in-house, rather than incurring the high cost, hassle, and risk of partnering with outsiders to execute vital business activities.

This is no longer true. Boeing Company is no longer an aircraft manufacturer; it has become a systems integrator. Mercedes-Benz does not build its own E-Class cars; Magna Corporation does the work, including final assembly. IBM has become a computer company that does not really make its computers; its partner network does.

Such changes in corporate structures have been made possible because of data networks and internet technologies. A new business architecture, termed business web or b-web by (Tapscott, 2004), is enabled by the Internet discontinuity. Its key characteristic is its nature of interconnected and distributed business entities that collaborate for value creation. A business web can be defined as a system composed of suppliers, distributors, service providers, infrastructure providers, and customers that use the Internet for business communications and transactions. The main benefit, and thus the attractiveness of business webs, is their potential for reducing search, coordination, contracting, and other transaction costs between firms.

A much quoted example is Siebel Systems Inc., one of the fastest growing software companies in America. It has established a vast and unique business web of customer, supplier, and employee relationships to deliver its products and services. Tom Siebel claims his company's b-web is the most important element in its success: the company has 8,000 people on payroll, but more than 30,000 people work for Siebel. The relatively small core company creates software products and orchestrates an extensive b-web composed of consultants, technology providers, system implementers, suppliers, and vendors that take its products to the global marketplace.

The transformative effect of business webs is based on the rationale that most of what companies do is not based on their core competencies. Instead, firms attempt to make do with some combination of in-house design, manufacturing, marketing, and other capabilities that are often not best-of-breed. With b-webs, business functions and large projects can be reduced to smaller components and farmed out (often simultaneously) to more specialized companies around the world with lower transaction costs. This further captures the benefits brought on by the competitive environment: suppliers strive to reduce costs and increase quality and innovation. They know there are other specialized workers and companies around the world keen to replace them.

In this environment, the management of partnering, corporate boundaries, distribution channels, industry restructuring and strategic repositioning is suddenly much more complex.

The complexity of corporate structure evolution is multiplied by new trends in strategic thinking. Business managers will no longer look at the integrated corporation as the starting point for creating value, assigning functions, and deciding what to manage inside or outside a firm's boundaries. Rather, they will start with a customer value proposition and a blank slate for the production and delivery system. There will be nothing to "outsource" because, from the point of view of strategy, there will be nothing "inside" to begin with. Business managers, using new tools of strategic analysis, will identify discrete activities that create value and parcel them out to the appropriate b-web partners. Hence, a lead firm in a b-web will choreograph the process, acting as a "context provider" for its b-web partners.

As a first step towards understanding how such changes in corporate structures may affect IT Governance (and, in turn, auditing), we have investigated a number of existing b-webs. By analyzing their key success factors and limitations, we have developed our B-web Transformation Model (depicted in Figure 2). In this model, corporate structures differentiate along two dimensions, corresponding to the b-web concept: B-web Partners' Distribution, and Partner Collaboration.

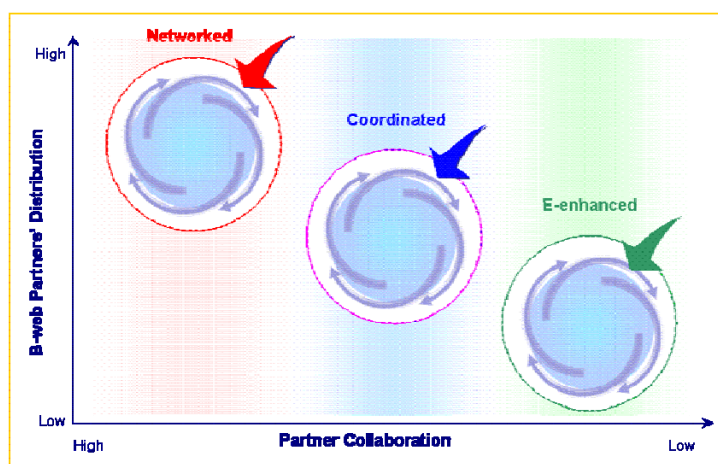


Figure 2. The B-web Transformation Model

In terms of B-web Partners' Distribution, a Low value indicates that a small number (one or two) of statically contracted entities are involved in the business web. A High value indicates that the b-web is comprised of a dynamically changing large group of organizations.

In terms of Partner Collaboration, a Low value indicates that collaboration among involved entities is limited to mostly communication tasks within the business web. In contrast, a High value points to the direction of market-like interactions among partners.

These two parameters combined define the fundamental characteristics of our model, and the corresponding impact on an organization's corporate structure. Based on that, we can group b-web-driven corporate structure evolution that corresponds to our model in three major levels: *E-enhanced* b-webs, *Coordinated* b-webs, and *Networked* b-webs.

E-enhanced b-webs are led by a single organization. Usually, a small number of technology firms are contracted for a support role and for infrastructure development. The main focus is on mapping existing processes and organizational structures on the digital realm.

In Coordinated b-webs, a lead entity coordinates a larger but controlled group of partners in order to offer a single point of service. Collaboration among the participating entities is guided and prescribed, and may involve limited cross-entity process reengineering.

In Networked b-webs, a large group of organizations is participating in the b-web and such participation can be dynamic and market-like. Cross-entity collaborative processes are in place, data standards have been adopted and there is ubiquitous application-level integration among all involved entities. B-webs of this type are most effectively developed when there is a sense of community among the partners and a culture of knowledge sharing and consensus can be established.

5. Challenges for Auditing

New corporate structures (like b-webs) will fundamentally change the way organizations are managed and operated. This is because such structures are based on dynamic configuration of business resources and distribution of operations among multiple, independent business entities.

As a result, new forms of business and IT risks appear that will require proper checks and controls for their containment. For example, the need for IT systems interconnection and integration in a b-web may by itself be a very complex and continuous activity. Both the implementation and operation of such an activity will need to be monitored, tested and acted upon discrepancies in order to ensure that information flows (especially financial) satisfy typical control objectives (accuracy, validity, compliance).

The effect on IT Governance can, therefore, be significant:

- on the financial side, the nature of evidence and the way it is accumulated in such a distributed environment of business entities may need to be altered. In addition, timing of accumulation may need to become continuous, thus adding a grounded need to the arguments

of (Percy, 1997). These may, in turn, lead to another cycle of changes in the IT infrastructure of an organization, with potential changes in the flow of financial information

- on the operational side, a number of IT and business processes will need to be reengineered to account for cross-entity involvement in their execution. Developing and monitoring control objectives for such processes may not be under the sole control of an organization any more. This, in turn, necessitates new auditing approaches in process testing and correction of control problems.

The above analysis leads inevitably to the executive management/Board directors and the resulting pressure on them for risk control and reporting processes:

- Will directors need to adopt a new strategic planning process?
- Will there be new principal risks for the company's business? How can they be identified?
- How do directors ensure the implementation of appropriate systems to manage these new risks?
- Do new disclosure controls and internal controls over financial reporting need to be designed?
- How can directors manage responsibility for the integrity of a company's internal control and management information systems, when these systems may heavily depend on a partner network?

In order to address these challenges for IT Governance and auditing within a distributed corporate structure like a b-web, our research aims: a) to analyze how IT Governance auditing parameters and requirements change as an organization evolves within our B-web Transformation Model: from a more monolithic, 'E-enhanced', corporate structure to a more distributed, 'Networked', corporate structure; b) to provide relevant recommendations and solutions.

The first phase of our research is focused on identifying the auditing parameters whose changes we will follow in the aforementioned evolution path. In order to ensure a methodological approach, these parameters are investigated through three layers of our B-Web Auditing Framework: *Corporate Strategy*, *Processes*, and *Technology* (see figure 3).

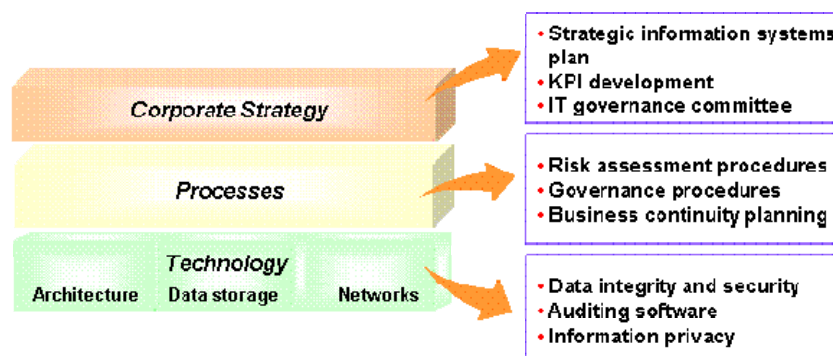


Figure 3. The B-web Auditing Framework

The common thread across these layers is the intrinsic delegation of partial or full control of certain operations/processes to b-web partners. Hence, the common research question we face in each layer is how a specific auditing parameter can be controlled, given that its operation may depend on a number of external, independent entities (the b-web partners).

In the Corporate Strategy layer, the IT Governance committee may need to become a cross-entity team for best controlling b-web to b-web partner relationships. In the same manner, key performance/goal indicators and drivers for the IT department may need to account for cross-entity, distributed systems that need to collaborate for service delivery or reporting. The overall strategic information systems plan will need to consider the above - directors and auditors will need to ensure the efficiency and cost effectiveness of controls assessment and testing efforts in such cross-entity operations.

In the Process layer, the cross-entity process execution may create new requirements for nearly real-time, continuous risk assessment processes. This will help directors and auditors gain trust over ongoing effectiveness of controls and have early warnings for control deficiencies. At the same time, testing procedures for control objectives may need to be revamped and become themselves distributed among the b-web partners. This may further affect an organization's business continuity plans as IT systems availability will partially depend on its b-web partner's systems.

In the Technology layer, information flows (financial or otherwise) through multiple entities create severe risks with regards to data integrity and security. New policies and procedures may need to be defined, enforced and monitored across a b-web. Beyond data integrity, information privacy may be jeopardized in such a distributed business environment. Policies may need to be agreed between b-web partners but enforcement may further necessitate cooperation among auditors (internal or external).

6. Future Research

The above research findings are the results of the first phase of our ongoing research initiative on corporate governance and organizational transformations. There are several directions we aim to follow in order to fully develop our aforementioned frameworks.

We are currently focusing on expanding the quantitative side of our research by developing relevant corporate/IT governance indices and measures. To that extent, a survey is under way, targeting the collection of data for a number of variables per organization that are significant to our frameworks:

- Corporate structure
- Corporate strategy
- Current corporate/IT governance infrastructure
- Current auditing infrastructure.

We expect that a thorough analysis of the survey findings will help us further clarify the role of the parameters that control our B-web Auditing Framework.

7. Conclusions

The Sarbanes-Oxley Act of 2002 constituted a turning point for Corporate Governance. It was the legislative key movement that signalled the beginning of a new audit culture. The Act includes a wide variety of measures that lay the foundations for a legislative approach of effective Corporate Governance by stressing out those issues that deal with control of financial information.

In a similar manner, IT Governance experienced a turning point with the advent of COBIT and related frameworks that helped make IT operations more understandable and manageable by business executives.

We believe that corporations and auditors are now facing an equally significant turning point: the evolution of corporate structures from monolithic into distributed partnerships (like b-webs) comprised of entities that collaborate to create value. In such structures, strategies, operations and risks will need to be shared among partner companies.

In order to address these new realities, auditors may have to overcome a number of challenges. Obtaining appropriate data access will not be a straightforward task. Defining appropriate measurement metrics may need to account for a multiplicity of factors whose control may span a number of administratively independent entities (the b-web partners). Setting appropriate thresholds for exceptions reporting will be an exercise of negotiating consensus. Minimizing impact on systems' operational performance will necessitate continuous risk assessment processes.

Such challenges will need to be addressed alongside changes in corporate structures. In fact, our research findings point towards a bi-directional relationship between corporate structures and IT Governance and auditing:

- Corporate structures can drive IT Governance and auditing parameters, as depicted by and described through our B-web Auditing Framework
- An auditing framework, like our B-web Auditing Framework, may eventually affect a corporation's strategic decisions about its corporate structure: if, for example, a firm needs to decide about joining a b-web, it will first have to assess the rationale and the impact of investment (human resources, financial) that will be necessary for the alignment of its governance and auditing activities to the b-web partnership.

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References

- Boritz, J.E., 2005, "IS practitioners' views on core concepts of information integrity", *International Journal of Accounting Information Systems*, (6), 260-279.

- Dey Report, 1994, "Where were the Directors?" Dey Committee, Toronto Stock Exchange.
- ITGI and PriceWaterhouseCoopers, 2006, "IT Governance Global Status Report", Information Technology Governance Institute and Price Waterhouse Coopers.
- ITGI, 2006, "Serving IT Governance Professionals, Survey Results 2005, Information Technology Governance Institute.
- Fama E. and M. Jensen, 1983, "Separation of Ownership and Control", *Journal of Law & Economics*, (26) 301-325.
- Hardy, G., 2006, "Using IT governance and COBIT to deliver value with IT and respond to legal, regulatory and compliance challenges", *Information Security Technical Report (II)* pp.55-61.
- Percy, J.P., 1997, "Auditing and Corporate Governance—a Look Forward into the 21st Century", *International Journal of Auditing* 1(1), 3-12
- PricewaterhouseCoopers, 2001, "Global Data Management Survey".
- Ramos, D., 2001, "The auditor's role in IT Governance", IT Governance Institute.
- Schwarz, A. and R. Hirschheim, 2003, "An extended platform logic perspective of IT governance: managing perceptions and activities of IT" *Journal of Strategic Information Systems* 12 pp.129-166.
- Shleifer, A. and R.W. Vishny, 1997, "A survey of Corporate Governance", *The Journal of Finance*, vol. 52 (2) 737-783.
- Sohal, A.S. and P. Fitzpatrick, 2002, "IT governance and management in large Australian organizations", *Int. J. Production Economics*, 75 97-112.
- Tapscott, D., 2004, "E-government in the 21st Century", Executive Series Report, New Paradigm Learning Corporation, Ontario, Canada.
- Trites, G., 2004, "Director responsible for IT governance", *International Journal of Accounting Information Systems*, 5 pp.89-99.
- Van Grembergen W. and, S. De Haes, 2004, "IT Governance and its mechanisms", IT Governance Institute.

CVs

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