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# Information technology governance: an evaluation of the theory-practice gap

Denise Ko and Dieter Fink

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## Abstract

**Purpose** – *The aim of this paper is to provide an understanding of information technology (IT) governance, from both a theory and practice perspective, and to identify current theory-practice gaps within the organisations studied.*

**Design/methodology/approach** – *This study developed a complementary and collaborative model of IT governance and used a multiple case approach in which IT governance is examined against the model in four major universities. Case study research is qualitative in nature enabling insights into the “how” and “why” of IT governance to be gained.*

**Findings** – *Based on underlying theory, the study was able to develop propositions regarding IT governance practices, observe current practices within the participating universities and establish gaps between theory and practice. The study identified theory-practice gaps in each of three IT governance dimensions: structure, process and people. Gaps ranged in significance from small to large. Two large gaps existed which require attention: they are in respect of integrating IT governance mechanisms and raising the awareness and understanding of the concept among senior management.*

**Research limitations/implications** – *The model of IT governance developed for the research can be further developed and refined. In addition, the university context may have imposed limitations as different findings could arise in different contexts. Furthermore, the participating CIOs and IT directors could have brought their own values and beliefs to the research when interpreting the IT governance objectives of their university.*

**Practical implications** – *The model of IT governance developed for the research enables organisations to assess and map their IT governance against theoretical dimensions. By mapping observed practice against theory, the study was able to provide a mechanism of identifying theory-practice gaps, where they existed.*

**Originality/value** – *IT is ubiquitous in nature because modern IT crosses organisational activities and has become strongly aligned with business activities. Thus IT governance can be viewed as an integral part of corporate governance and requires senior management’s attention. However, because of the specialised nature of IT, governance in this domain has unique characteristics. Yet, current literature reflects a lack of maturity and points to diverse and inconsistent concepts of IT governance as well as variations in how IT governance is implemented. The paper reduces uncertainty for corporate executives by systematically synthesising current literature, developing a theoretical model and testing it against current practice.*

**Keywords** *Communication technologies, Governance, Universities*

**Paper type** *Research paper*

## 1. Introduction

The increased attention given to corporate governance is largely a response to the collapse of Enron and WorldCom and the subsequent passing of governance legislation in the form of the Sarbanes-Oxley Act in the USA in 2002 (Brown and Grant, 2005). The reason for also focusing on information technology (IT) governance is due to IT becoming ubiquitous in nature, i.e. modern IT crosses organisational activities and has become strongly aligned with business activities. Thus IT governance can be viewed as an integral part of corporate

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governance and therefore requires senior management's attention. The integration of the two forms of governance is highly desirable as it has been shown that factors that significantly impact on corporate governance will cascade to IT governance (Korac-Kakabadse and Kakabadse, 2001).

However, because of the specialised nature of IT, governance in this domain has unique characteristics. This is largely due to the complex technological nature of IT. Yet, current literature reflects a lack of maturity and points to diverse and inconsistent concepts of IT governance (Webb, 2006). Furthermore, the implementation of IT governance in practice varies greatly. For example, *Computer Weekly* (2004) refers to the behaviour of organisations as jumping on board of the "IT governance bandwagon". The aim of this paper, therefore, is to provide a systematic approach to evaluating IT governance by first identifying the key dimensions of IT governance from existing literature, and second by observing how these are reflected in practice. In this way the study provides an understanding of both theory and practice and is able to offer insights into existing gaps with theory.

## 2. Overview of IT governance

IT governance can be viewed from diverse perspectives. For example, the architectural view (Peterson, 2004a) examines IT governance as organisational capacity exercised by the board, executive management and IT management. This requires leadership according to the IT Governance Institute (2003). Weill and Ross (2004a) go as far as requiring senior levels to specify decision rights and an accountability framework to encourage desirable behaviour in the use of IT. By this one would include the aim to maximise the value derived from IT, its security and so on. In combination with leadership, structures and processes should ensure that IT governance achieves the fusion of business and IT (van Grembergen, 2002). All are required to ensure that IT systems sustain and extend the organisation's strategies and objectives (IT Governance Institute, 2003). In this way, IT governance has become an important integral part of corporate governance.

In essence, IT governance focuses on organisational alignment, integration and relationships. This theme will be taken up again later in the paper when the research model of IT governance is presented. Suffice to indicate here that benefits arise when IT and business activities are aligned so that they both have the objective of achieving organisational goals. IT provides the means to integrate organisational activities by eliminating duplication, bottlenecks, etc., referred to in the IT discipline as business process improvements. Furthermore, the activity of governance itself improves the understanding, and hence the working relationship, between IT and the rest of the business. As a result, benefits can be readily identified, such as returns in the form of increased sales, profits, etc. and balance struck between value creation (risk taking) and security (risk managing).

The above perceptions give broad insights into the scope of IT governance but, as Peterson (2004b, p. 41) suggested, the various detailed concepts of IT governance are still evolving, mainly because of "the specialisation and disconnectedness between globally-dispersed IT governance interest communities". This refers to the various bodies that have developed IT governance best practice frameworks. Best practice, as defined by the IT Service Management Forum (n.d.), is "an industry accepted way of doing something that works". They are standards-based frameworks that were developed and sponsored by highly regarded organisations, like the Information Systems Audit and Control Association (ISACA) and Information Technology Governance Institute (ITGI). Amongst the best practice frameworks, three most widely adopted ones according to Stafford (2003) are COBIT (Control Objectives for Information and Related Technology), ITIL<sup>®</sup> (Information Technology Infrastructure Library), and ISO17799: 2000 (International Standards Organisation).

COBIT was originally developed by ISACA in 1996. It is a high-level governance and control framework and views IT from a control and process perspective. In doing so, COBIT aims to ensure that IT is aligned with the business, to maximise benefits from the use of IT, to use IT

resources responsibly and to ensure IT risks are managed and mitigated. ITIL<sup>®</sup> is a service management framework developed by the UK's Office of Government Commerce in the 1980s to better use IT resources and services (ITIL, n.d.). It was originally very much a process-oriented framework but has evolved into a more lifecycle-centric approach in its recent release (Version 3). Whilst COBIT articulates "what" needs to be done, ITIL<sup>®</sup> focuses on "how" to do it and "who" should perform each task.

ISO17799:2000 is a security management framework published by the International Organisation for Standardisation (or ISO) and was derived from the UK government's BS17799. It supports IT governance from a risk management perspective, emphasising the reduction and mitigation of IT risks to which organisations are exposed. By contrast, VallT, first developed by ITGI in 2006, is a framework to assist organisations to look at IT from a business and financial strategic point-of-view. According to the Information Technology Governance Institute (2006), IT should be a means to an end with VallT seeking to ensure that values are realised from IT investments.

### 3. IT governance dimensions

An understanding of the IT governance concept is essential as it establishes the boundary and the scope within which IT governance functions. This allows an organisation to gain a better perspective on the governance activity and provides focus for management attention. The approach used to defining the governance concept in this paper was to review the existing literature in order to identify practices that had been studied by previous researchers or were identified in professional publications. In this way it was possible to construct a theoretical IT governance model as outlined in a later section.

According to Keynes-Pearce (2002), views on IT governance can be grouped on a spectrum ranging from structure-oriented, with the emphasis on control and coordination, to process-oriented with emphasis on sustainable capability and continuity. In between is the people-orientation to encapsulate the human element, such as leadership, as indicated earlier.

#### 3.1 Structure

Structure can be viewed as how the IT function is carried out; for example through designating responsibility to an IT executive and relevant IT committees (van Grembergen and de Haes, 2005). In addition, the IT function itself requires structure as well as deciding where the IT decision-making authority is located within the organisation (de Haes and van Grembergen, 2004). According to Weill and Ross (2004a), the IT governance structure is the single most important predictor of whether an organisation will derive value from IT. As such, organisational structure reflects the power structure and delineates important relationships within the organisation (Johnson and Scholes, 2002). There are three basic forms of IT organisational structure:

1. centralised;
2. decentralised; and
3. federal (Brown and Magill, 1994; Schwarz and Hirschheim, 2003).

Structure can also be viewed as "a rational set of arrangements and mechanisms" (Weill and Ross, 2004a, p. 183). Most commonly, committees provide a formal and effective mechanism for organisations to manage its IT. As an example, the IT strategy committee reviews and approves IT strategy which provides high-level direction and control over IT to deliver value and manage risks whilst the IT council committee considers different levels of policies and investments (van Grembergen *et al.*, 2004). In practice, different committees encompass different memberships and authority and are subject to organisational culture. However, Weill and Ross (2004b) suggest that the number of governance mechanisms be limited.

### 3.2 Process

An older viewpoint of IT processes is that of Henderson *et al.* (1996) who define process in terms of the IT infrastructure, i.e. along the lines of traditional IT activities such as systems development and operations. These processes are technical in nature and are considered in frameworks such as COBIT and ITIL<sup>®</sup>. More recently, the emphasis of IT governance is to implement processes that ensure strategic alignment between IT and business. Strategic alignment ensures that IT projects are aligned with strategic business objectives, and consequently are funded and prioritised. The ValIT best practice framework, outlined earlier, reflects this viewpoint.

Notwithstanding the interpretation given to the nature of processes, appropriate performance measures are required to achieve improvements and sustain positive outcomes. As van Grembergen and de Haes (2005) suggest, organisations need to find a good balance of measures between output and performance, comprising technical measures and business measures. Technical measures evaluate technical-related issues such as IT downtime and access failure (an internal perspective) while business measures evaluate business-related issues such as customer satisfaction (an external perspective). According to PricewaterhouseCoopers (2007), IT governance is generally not being measured properly in this respect.

### 3.3 People

Structure and process appear to be the most common IT governance dimensions found in the literature (see Keynes-Pearce, 2002), while the people dimension seems to have attracted less attention (Capozzi and Singleton, 2002; IT Governance Institute, 2003; van Grembergen and de Haes, 2005). In this study, the people dimension was intentionally made explicit. As stated by the IT Governance Institute (2003), IT governance requires leadership to ensure that IT activity is sustained and extended to achieve the organisation's goals. van Grembergen (2000) concurred but added refinement in that one of the key success factors for IT governance is organisational capacity exercised by the board, executive management and IT management. As defined by Henderson *et al.* (1996), organisational capacity refers to the human skills and capabilities required to support and shape the business.

The emphasis on leadership is confirmed by Weill (2004) who found that the factor that most separates top-performing organisations from substandard-performing organisations is the quality of senior leadership in making IT decisions. Leadership should be proactive and strategic (Broadbent, 2003), which requires commitment from the top and supportive behaviour that leads to effective resource allocation to IT (Weill and Ross, 2004b). Emphasis should be on transparency and the need to educate the organisation on how governance decisions are made in order to reduce the mystery of IT and encourage lower level managers to accept responsibility for effective IT use (Weill and Ross, 2004b).

An important emphasis in IT governance is the clear and unambiguous roles and responsibilities for the board of directors and the well-defined identification of all involved parties (de Haes and van Grembergen, 2004). The implementation of IT governance may require organisations to rethink their governance structure and individuals to re-learn their roles and relationships (Weill and Ross, 2004b). When senior management involves itself in IT decision-making, the organisational culture also changes; they will have to "buy into" the concept of, and commit to, IT governance. As a prerequisite, an understanding of IT governance is required. As Weill and Woodham (2002) found, the ability of senior management to accurately describe their IT governance approach is an important predictor of governance performance. However, studies have found that a proper understanding of IT governance often is still lacking (Brown and Grant, 2005; Robinson, 2005).

## 4. IT governance model

IT governance is a relatively new research domain and hence IT governance models take on many forms. Brown and Grant (2005) reviewed and classified existing literature into

two streams. They termed stream 1 “IT Governance Forms” because it dealt mostly with decision-making structures adopted within IT organisations and gaining a better understanding of them. The baseline for this model is the “bi-polar notion of centralized and decentralized loci of IT decision making” (p. 699). Stream 2 is termed “IT Governance Contingency Analysis”, in which “research focuses on the ‘why and how’ of IT governance fit” (p. 703). This is a more insightful approach as it looks at IT governance in a holistic manner. However, the authors admit that research into IT governance is incomplete and encourage “academics and practitioners alike [to] continue to explore the concept of IT governance in an attempt to find appropriate mechanisms to govern corporate IT decisions” (p. 696). Among those is the development of underlying models.

The need for developing underlying models was taken up by Peterson (2004a) but in a proactive manner. The author suggested that today’s organisations need a flexible, complementary and collaborative IT governance arrangement to prosper in a turbulent environment. Such an arrangement would enable organisations to sustain realising value from IT instead of restraining its contribution by emphasising control. He, therefore, perceived IT governance as a collaborative network structure. For this research the previously discussed dimensions and their sub-dimensions are perceived similarly as shown in Figure 1.

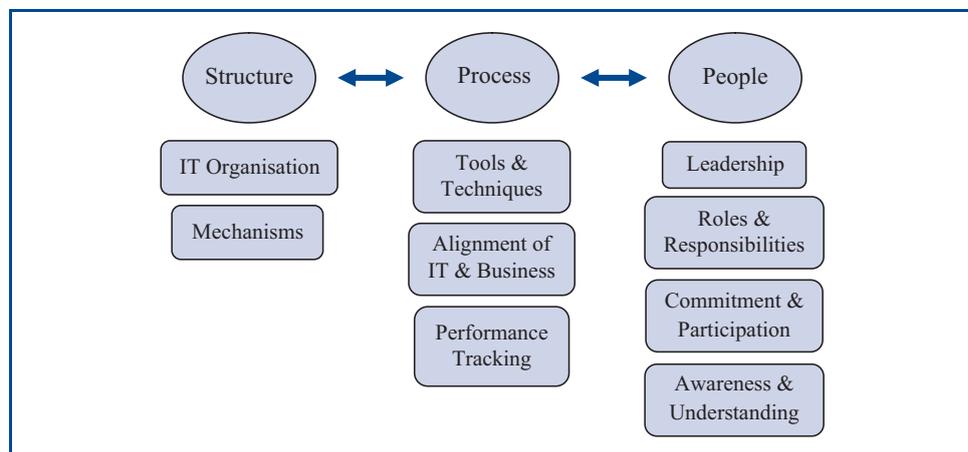
Figure 1 re-enforces the IT governance characteristics of alignment, integration and relationship earlier mentioned. It indicates a broad and holistic view of IT governance where multiple IT governance dimensions and sub-dimensions work with each other. A narrow perspective, such as the “IT Governance Forms” approach, which focuses primarily on decision-making structures (Brown and Grant, 2005), will not achieve this. A further advantage is that, by taking into account multiple dimensions, a better understanding of the scope of IT governance, an important objective of governance research can be gained.

## 5. Research methodology

### 5.1 Research design

This study used a multiple case design in which the research phenomenon (IT governance) is examined in real life situations. Under the approach, the real-life context (in this study, the university sector as explained below) is the backdrop and specific instances (one or a few cases) are chosen to illustrate how IT governance is practised. Case study research uses qualitative methods to provide the ability to ask insightful questions on “how” and “why” rather than addressing the frequency of the incidences,

**Figure 1** Complimentary and collaborative model of IT governance



as in quantitative research. This was important for this study because of the emerging and contemporary nature of IT governance, where the boundaries between phenomenon and context are still not clear.

Some researchers, such as Yin (1994) and Stake (1995), refute that case study research is sampling research; hence a representative sample is not required in this methodology. Merriam (1998) argues that probability sampling is not necessary nor justifiable in qualitative research; thus the selection of qualitative research samples is often non-random, purposeful and small. In this study, the non-probabilistic and purposeful sampling method was used to choose the target organisations, the four major universities located in Perth, Western Australia. The cases were chosen because of their relative large size and because IT governance is recognised as important in the sector.

## 5.2 Research process

The semi-structured interview method was adopted for this study since it provides structure (to reflect the theoretical research model) as well as the opportunity to ask participants in-depth questions about their IT governance practices. Flexibility is allowed through additional probing questions designed to encourage participants to clarify their responses, an outcome that would not have been available in a purely structured interview. Participants were encouraged to freely share their relevant experiences or ideas if these were not covered in the structured questions. Questions were developed during the literature review as outlined in a previous section.

While primary data were gathered during the interviews, secondary data were collected from the universities' websites. To assist in organising, storing and coding data, it was decided to make use of the software package NVivo. With this package, data are methodically coded and stored in a repository which can be accessed readily and analysed efficiently during subsequent research stages (Walsh, 2003). Yin (1994) refers to this type of repository as a case study database which maintains a chain of evidence to allow cases be examined progressively and in-depth. Data coding followed a parent-child approach; nodes were created and interrelated to other nodes in a hierarchy of nodes ("tree nodes"). For this study, "tree nodes" mirrored the three research dimensions – namely structure, process and people – with sub-dimensions being organised under the parents as child-nodes. Data were coded by word, sentence (or partial sentence) and paragraph (or partial paragraph).

Findings were mapped against the theoretical dimensions (see Figure 1) to identify any existing gaps between theory and practice.

## 6. Findings and discussion

To recap, the purpose of this study was two-fold:

1. to identify theoretical dimensions of IT governance; and
2. to use them to examine IT governance practices.

To answer the first question, a detailed literature review was undertaken, drawing on the work of leading researchers. To answer the second question, the case study research methodology was adopted including the use of semi-structured interviews. Below are the findings of the study; a summary is provided in the Appendix, Table A1.

### 6.1 Background information

Research participants were IT Directors/Chief Information Officers (CIOs) representing senior IT management. They worked in four major universities, as shown in Table I.

Case A had a long history as an educator dating back to the early 1900s. A strategic plan "Towards 2020" existed, following a review in the late 1990s that included the IT organisation, which was found to be "disconnected" and lacking in governance. Case B is a traditional university with a strong research focus. IT governance was initiated by the IT Director around 2006. Case C is a large tertiary institution established in the 1960s with the

**Table 1** Background data

Organisation	Size	Interviewee
A	1,800 academic and administrative staff and over 21,000 students	IT director
B	3,500 academic and administrative staff and around 20,000 students	IT director
C	6,000 academic and administrative staff and over 40,000 students	CIO
D	1,500 academic and administrative staff and around 15,000 students	CIO

vision of becoming a leader in teaching and research within Australasia. IT governance was first introduced to the organisation following an external review in the late 1990s with some perceived success. Case D has a strong focus on value delivery, with a strategy that emphasises quality, people, engagement and commercial and financial rigour. IT governance was initiated by the CIO following a review conducted around 2005.

### 6.2 Structure

The study showed that IT organisational structures varied from a centralised, through federal to the decentralised mode (see the Appendix, Table A1). However, discussions with IT Directors/CIOs indicated a general preference for the centralised mode even though many existing IT resources were situated in faculties and business units. They felt that IT services required to be centralised. From a management point-of-view, having a decentralised IT organisational structure was seen as high risk because it weakened control over IT. Efforts were continuously expended on moving the IT structure towards a more centralised mode.

However contingency factors were found which also determine the choice of IT structure. An organisation was not necessarily driven by the benefits gained through centralisation or decentralisation; instead the existing organisational structure overshadowed and determined the form of IT organisational structure. For instance, Case B remained in a decentralised IT mode because of the resistance to centralisation by faculties and/or business units. Their reluctance to change appeared to have weakened the overall effectiveness of IT governance. As a result, Case B was still at an early stage of IT governance even though it had been in place for more than two years.

The impact of existing organisational culture on structure was apparent for Case C. Its CIO expressed the view that to make IT governance successful, it was important to “measure the temperature” of the organisation, which was clearly a reference to organisational culture. He repeatedly used the terms “shared meaning”, “interaction” and “common understanding”, suggesting that these elements were needed to make effective IT governance possible. Case C structured its IT in a federal mode, aiming to get the benefits of both centralisation and decentralisation.

A limited number of committees were present in each of the case organisations when it came to IT decision-making. This reflected good practice as did well-defined terms of reference for various types of IT decisions. On the other hand, the cases had different levels of sophistication and mixes of stakeholders. For instance, while all case organisations focused on the present timeframe, Case D, in addition, had a future focus by setting up a committee to explore future IT use. Moreover, this committee included experts (both IT and non-IT) from both inside and outside the organisation.

### 6.3 Process

This dimension received much attention as a result of the long-established process perspective of IT governance. The study showed that participating organisations used some or most of externally developed best practice frameworks for IT governance (Case A, ITIL<sup>®</sup> and COBIT; Case B, ITIL<sup>®</sup>, Case C, COBIT; ITIL<sup>®</sup>, ISO17799; Case D, ITIL<sup>®</sup>). Generally their use of IT governance frameworks was needs-driven rather than methodology-driven. For example, for Case A the current ITIL<sup>®</sup> focus is on change management and configuration management while for Case B ITIL<sup>®</sup> was introduced to improve IT service quality.

Cases C and D refuted that current IT best practice frameworks qualified adequately as governance frameworks. Case C overcame their concern by adopting an overarching IT governance framework, namely Australian Standards AS8015 (Corporate Governance of Information, Communication and Technology) as the basis for integrating the other frameworks it used (COBIT, ITIL<sup>®</sup>, ISO17799). A different approach was that of Case A which stressed the importance of having a project management methodology in place to supplement IT governance frameworks. They explained that a project management approach is required to ensure timely project delivery and being able to demonstrate the smooth delivery of benefits and values flowing from IT to the organisation.

All organisations understood that IT governance did not work independently and needed to be linked back to corporate governance and overall organisational strategy. This is in line with the existing literature, which places a strong emphasis on the relationship and alignment between IT governance and the wider context of corporate governance. However, by viewing IT as a cost and supporting service, Cases A and B could compromise the effectiveness of IT due to a lack of consideration for the broader strategic benefits that IT brings to the organisations. IT projects could be determined by business cycles (such as emphasising cost management during a recession) rather than being determined by long-term strategic considerations.

It is important for organisations to track their performance particularly if they want to justify the use of IT. However, the findings showed that this sub-dimension received less-than-adequate attention by all case organisations. One reason is that there is a lack of consensus within organisations about what to measure given performance was viewed from different perspectives. For example, the conundrum existed of should IT performance be measured in a technical or non-technical manner. Furthermore, external measurement frameworks, such as the Balance Scorecard approach, were perceived as not particularly suitable to their organisational context and thus the organisation attempted to develop internal measures to gauge performance. In Case D, the CIO further argued that performance measurement only documented past results rather than providing insights for future planning.

### *6.3 People*

IT governance was significantly influenced by senior management's view of the purpose of IT. Case A and Case B treated IT as cost reducing, and improving operational efficiency and effectiveness. IT was seldom addressed during board meetings. As a result, IT governance remained at an operational and internal level; there was not much IT strategic dialogue within top management. In contrast, Case C and Case D treated IT as an enabling technology. These organisations invested time to explore how IT could be fully utilised and made to drive the organisations forward. IT was treated in a strategic, external and future manner. There was a clear indication of strategic dialogue between top management and CIOs.

The study showed that organisations were very aware of the need to have well-defined and unambiguous roles and responsibilities in regard to IT governance. These were well documented and carried out in a formal manner. In addition, the IT Directors/CIOs reported to other, more senior executives who, in turn, reported to the Chief Executive Officers (Vice-Chancellors). Overall, this study confirmed that accountability for IT governance should fall on IT Directors/CIOs and the senior executives to whom they directly reported. Additional positive feedback was that interviewees were able to describe their roles and responsibilities clearly and treated IT governance as part of their core responsibilities rather than as additional work.

However, variations were found in levels of commitment and participation from senior management in respect of IT governance. Most noticeable were Case B and Case C. Senior management from Case B showed a much lower level of commitment than senior management from Case C. For example, in Case B there was no involvement of the audit function with IT even though audit was located high in the organisation. In Case C, by contrast, IT was seen as a major contributor to customer service, a goal recognised by senior

management as being important to the entire university. Without significant executive “buy-in”, IT governance will not be sustained; their endorsement of IT governance strengthens corporate governance.

Awareness and understanding of IT governance varied across the cases. In Case A, the IT Director held a technical and control perspective of IT governance; he defined IT governance in terms of “managing the service outcomes and business outcomes of the information in the organisation [ . . . ] and managing the technical things to make it work”. The IT Director in Case B projected a technical, control and authority perspectives of IT and viewed IT governance as “the mandate that comes from what you are trying to do [ . . . ] it is a clear cut mandate for who does what and coordinate them in getting agreement toward it”. Case C, by contrast, defined IT governance from a holistic point of view; IT governance was viewed as “an overarching set of principles, policies and procedures. It is to provide reassurance to the senior executive that risk is being effectively managed with regard to IT, IT is delivering value to the organisation, and IT is closely aligned with the business needs”. The CIO in Case D defined IT governance as “essentially a decision and communication process” reflecting a strong communication and decision-making perspective.

## 7. Theory-practice gaps

This research identified theoretical IT governance dimensions and underlying practices. They provided the opportunity to develop more formal propositions against which current practice could be compared. Below are propositions developed from the IT governance literature accompanied by the observed variations of practice from theory.

### 7.1 Structure

1. *IT organisation.* Adopt a centralised mode to reflect organisational preference. For the participating universities, centralised IT governance was preferable since this enabled them to maintain control over the decentralised IT functions in faculties and business units. However, there was a small gap in that not all participants had moved (Case D) or were in the process of moving (Cases B and C) to this mode of IT governance.
2. *Mechanism:*
  - Limit the number of committees and ensure clear committee responsibilities to maintain IT decision-making effectiveness. This was so for all cases. No gap is apparent.
  - Ensure that stakeholders are adequately represented and have input to reflect organisational culture. In universities, a collegial organisational culture exists which was largely in evidence within the universities studied. Stakeholder input was encouraged. No gap is apparent.
  - Clarify committee responsibilities especially in regards to final IT decision-making. Findings indicate that the latter is usually undertaken by the IT Director/CIO except for Case B where the IT Director sees himself as a participant. Thus, there is a small gap which is due to the omission of clear procedure for final decision-making.

### 7.2 Process

1. *Tools and techniques:*
  - Adopt an externally developed best practice IT governance framework to get most benefits from IT governance mechanisms. Usage varied from extensive (Case A) to limited (Case B). Therefore, a moderate gap exists requiring more intensive use of existing frameworks.
  - Use an overarching framework to integrate various best practices in use. Only Case C used such an approach. Therefore, a large gap exists which requires the integration of the divers IT governance approaches in use.

2. *Alignment of IT and business.* Ensure the linkage between IT governance and corporate governance to achieve strategic business outcomes. Evidence existed of deliberate alignment between IT and business. Except for Case B, participating universities were responding to this proposition. A small gap is present which requires that alignment is made as tight as possible.
3. *Performance tracking.* Introduce IT performance tracking and measurement and/or improve tracking by balancing business and technical outcomes. Findings ranged from no tracking (Case B) to using a mix of technical and non-technical measures (Cases A and C). As a result, there is a moderate gap; effective performance tracking should always be present.

### 7.3 People

1. *Leadership:*
  - Move from reactive, cost leadership of IT to pro-active, strategic leadership. The cases studied provided indication of both the former (Cases A and B) and the latter (Cases C and D). Thus there is a moderate gap which will be closed with the move to strategic IT leadership.
  - Implement a dialogue between CIO/IT Director and senior management on the strategic value of IT. This was both present (Cases A and B) and absent (Cases C and D). Thus a moderate gap exists which will be closed with increasing dialogue.
2. *Roles and responsibilities.* Define roles and responsibilities clearly to ensure effective execution of IT governance responsibilities. This was much in evidence in the cases studied and therefore no gap was apparent.
3. *Commitment and participation.* Expect strong commitment to IT governance from executive staff. The findings indicated mostly strong levels of active involvement in IT governance with the exception of Case B. A small gap exists which can be closed by greater “buy-in” by executives.
4. *Awareness and understanding.* Ensure full understanding of IT governance, for example along the dimensions covered in this paper. The study showed various perspectives of IT governance, ranging from holistic (overarching framework – Case C) to narrow (technical control – Case A). Therefore there is a large gap that can be narrowed by increasing awareness and understanding of the concept.

## 8. Conclusions, limitations and further research

IT governance should be highly practical and relevant to contemporary organisations. Knowledge about IT governance should not be only created inside the research community but disseminated through dialogue and collaboration between the academic community and industry. The study was able to provide a theoretical framework of IT governance and apply this to provide insights into gaps between theory and practice that were observed within the four universities studied. While the study showed instances of no gaps, it also revealed gaps ranging in significance from small, moderate to large. Two large gaps existed which require attention; they are in respect of integrating various IT governance mechanisms that may exist within the organisation and raising the awareness and understanding of the concept among executives.

There are a number of research limitations that should be acknowledged. First, the research model is theoretical and as such could be further developed. It should be noted that list of practices outlined in the paper cannot be claimed to be all-inclusive or held to be totally comprehensive. Different reviewers of the literature may have identified similar or different practices. Second, the research could be replicated with a wider sample of organisations to provide more refined results and potential for generalisation within the university sector. The research participants of this study were the CIOs/IT Directors of the organisations who are the key personnel involved in IT governance. However, their conceptual awareness of the questions asked and interpretations of the IT governance practices of their university could

have influenced their answers. This subjectivity could have decreased the reliability of data. In addition, the case study approach itself has limitations. It relies on the analytical ability of the researcher to reduce data contamination, code and interpret the data collected. To minimise these subjectivities, secondary data from websites were consulted to strengthen and confirm the study's findings. However, as this verification process is not made explicit for reasons of maintaining the confidentiality of the participants' websites, a replication of the study could produce different outcomes.

Moderating factors from outside and inside the organisations could be considered in future research. These include organisational culture, and leadership and communication styles. For example, it would be worthwhile to assess fully the role of organisation culture in facilitating the implementation of IT governance and its impact on effectiveness. Further studies could also focus on CIOs/IT Directors – their characteristics, what they do, how they do it and especially how they influence IT governance performance. The study provided a snapshot of how organisations perform their IT governance at a particular point of time. Therefore, the results did not provide detailed insight into how the case organisations had evolved and responded to the changing environment. But, by using this study as a reference point, future study incorporating a longitudinal research design could indicate how organisations change their IT governance approaches over time.

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### Further reading

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## Appendix

**Table A1** Summary of findings

<i>Dimension</i>	<i>Case A</i>	<i>Case B</i>	<i>Case C</i>	<i>Case D</i>
<i>Structure</i>				
IT organisation	Centralised organisation with few exceptions where units have their own IT	Decentralised organisation. Attempts to bring it to a more centralised mode	Federal organisation. Attempts to bring the organisation to a more centralised mode	Federal organisation
Mechanisms	Various committees are used with clear committee responsibilities. Stakeholders have inputs. IT Director as decision maker	Various committee are used but with unclear committee responsibilities. Stakeholders have inputs. Unclear who makes decision. IT Director perceives himself as "participant"	Various committees are used with clear committee responsibilities. Stakeholders have inputs. CIO as decision maker	Various committees are used with clear committee responsibilities. Stakeholders have inputs. CIO as decision maker
<i>Process</i>				
Tools and techniques	Good best practice frameworks usage (ITIL <sup>®</sup> , COBIT) together with project management	Limited frameworks usage (ITIL <sup>®</sup> )	Range of best practice frameworks used (COBIT, ITIL <sup>®</sup> , ISO17799)	Aspects of practice framework used (ITIL <sup>®</sup> )
Alignment	Aligned with organisational goals	Limited alignment with organisational goals	Aligned tightly with organisational goals	Aligned tightly with organisational goals
Performance tracking	Measurement of the technical and non-technical aspects of IT governance	No formal performance tracking	Measurement of the technical and non-technical aspects of IT governance	Measurement such as in terms of cost, time and benefits
<i>People</i>				
Capacity and leadership	Cost leadership. Reactive. Little strategic dialogue on the value of IT	Cost leadership. <i>Ad hoc</i> and reactive. Little strategic dialogue on the value of IT	Strategic leadership. Proactive. Strategic dialogue between CIO and senior management	Strategic leadership. Proactive. Strategic dialogue between CIO and senior management
Roles and responsibilities	Clear and explicit definition of roles and responsibilities	Clear definition of roles and responsibilities	Clear and explicit definition of roles and responsibilities	Clear and explicit definition of roles and responsibilities
Commitment and participation	Active involvement from senior management	Lack of commitment and participation from senior management	Very active involvement from senior management	Active involvement from senior management
Awareness and understanding	IT governance is seen from technical and control perspectives	IT governance is seen as the mandate of who in charge is supposed to do	IT governance is seen as an overarching framework to provide common understanding	IT governance is seen as a decision-making process

### About the authors

Denise Ko holds a doctorate degree in Business Administration (major in Information Systems). Prior to that, she obtained a Master's in both Organisation Development and Computer Science, respectively. She has been in a management position for the last ten years, in which her work involved the integration of both business and technology. Her interests and curiosity in both areas provided the motivation to study how IT governance is practised in today's organisations.

Dieter Fink is an Associate Professor in the School of Management at Edith Cowan University in Perth, Western Australia. Prior to joining academia he worked as a Systems Engineer for IBM and as Manager, Information Technology (IT) Consulting for Arthur Young (now Ernst & Young). He has been a visiting academic at a number of universities including Australian National University, University of Cape Town, Canterbury University, and Free University of Berlin. His primary interest is in IT Governance which includes establishing and measuring the value of IT investments such as websites, IT adoption, and minimising IT risk. Dieter Fink is the corresponding author and can be contacted at: [d.fink@ecu.edu.au](mailto:d.fink@ecu.edu.au)

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