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# **A study of the review and improvement of IT governance in Australian universities**

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## ***ABSTRACT***

This research uses a case study approach to examine how IT governance has evolved in eight public universities in Australia. Data is gathered through interviews of IT management, university executive, and representatives of the core functional areas. This study adds to the body of knowledge on strategic IT management by exploring the effects of advancing technology and business environmental changes on IT governance in complex, decentralised organisations. The research found that all of the universities examined shared a common history of highly decentralised, faculty based IT functions which appeared to be a natural evolution from the initial move from mainframe computing several decades ago. In each of the case studies this evolution has led to a multitude of IT related issues. These include duplication of resources, difficulty in achieving institution wide alignment with strategic business objectives, and IT risks that were not being managed. As a consequence these institutions were in various stages of review and subsequent implementation of comprehensive IT governance restructures. The paper provides a rich insight into the motivations, process and outcomes of the review process.

## ***Keywords:***

IT Governance, Business Alignment, IT Resources, University Governance, Mechanisms of IT Governance, IT Risk Management, Review, and Restructure.

## **1. Introduction**

As is the case in most organisations IT has become pervasive in tertiary educational institutions, accounting for a significant portion of capital and operational expenditure but never seeming to achieve its full potential (Farrar, 2010). The challenge for universities is then to understand IT governance and to implement governance structures such that the full potential of IT can be realised. This paper provides insights into the motivations, process and outcomes of the evolving process of IT governance in complex organisations. This will provide a valuable aid to IT practitioners and managers involved in the IT governance process.

Within universities the growing importance of corporate governance and IT governance has been recognised by a number of studies. For example, Governance, Organisation, and Leadership was identified by IT leaders in higher education as number 7 in a survey of the top ten IT issues for their universities to deal with for strategic success (Allison et al., 2008). Many case studies have examined the review process in individual universities but there is a lack of a wider multiple case studies that describe commonalities on a collective basis. This research addresses that gap and formulates a process description based on the common experiences of eight case studies. The research question in this study is: *What are the common experiences of Australian universities in reviewing and improving IT governance?*

Data for this research was gathered through interviews, document and website searches in each case study. A total of fifty five interviews of the IT executive, business executive, and various levels of users and other stakeholders were conducted. The collected data was analysed according to themes identified by research codes. This analysis was used to map the process of review and change in each university. Common elements were identified and used to develop the process description.

The research found that the universities examined shared a common history of highly decentralised, faculty based IT functions which appeared to be a natural evolution from the initial move from mainframe computing several decades ago. In each of these case studies this evolution has resulted in a multitude of IT related issues. In most cases these issues have reached a critical point that has triggered a review and ultimate restructure of the universities IT governance.

## **2. Overview of IT governance**

Hunton et al (2004, p.2) define IT governance as, “The process of controlling an organisations IT resources.” IT governance forms an important and integral part of an organisation’s corporate governance obligations (Bergman & Croft, 2005; Georghe, 2010; Ko & Fink, 2010). Many reasons are quoted for IT governance’s status. These include (Hunton et al., 2004; ISACA IT Governance Institute & the Office of Government Commerce, 2005):

- The relative dollar amount of an organisations investment in IT;
- The strategic opportunities that IT may provide;
- The level of risk arising from IT and its associated investment;
- The existing and growing dependency by organisations on their information and communication systems and infrastructure; and
- The increasing body of regulatory, legal and contractual obligations necessary for an organisation to comply with.

The outcomes of IT governance can be categorised as strategic alignment, value delivery, risk management, resource management, and performance measurement (IT Governance Institute ISACA & The Office of Government Commerce, 2005; Musson & Jordan, 2005). Inherent in these outcomes is the establishing of accountability, decision levels and rights, and other principles of good IT governance (Weill & Ross, 2004b). These IT governance focus points are also outlined in CobiT 4.0 and are leveraged to ensure IT and business are aligned, IT benefits are optimised, the responsible use of IT resources, and minimisation of IT risks (ISACA IT Governance Institute, 2005). Given its growing pervasiveness and importance the challenge then is for organisations to optimise the benefits that IT

governance can provide, while controlling the costs and risks associated with the use of IT (Hunton et al., 2004; De Haes & Van Grembergen, 2008; Farrar, 2010).

A study of 300 firms undertaken by Weill and Ross (2004a, p.1) failed to establish a, "single best formula for governing IT", but concluded that effective IT governance, "doesn't occur by accident". Weill and Ross (2004b) proposed that organisations with effective IT governance had IT governance „patterns“ matched to complement the organisations strategic focus. For example an organisation pursuing revenue growth would focus on customer responsiveness and fast innovation through a decentralised IT governance decision making structure.

It is clear that effective IT governance has many characteristics, though it is equally clear that the omission of any particular one is not a determinant of a defective or non-existent IT governance function (Weill and Ross, 2004b). A key characteristic of an effective IT governance structure includes the ongoing review of the IT governance function. IT governance is not a static concept but a process deeply embedded in the organisational structure and inseparable from it. As such it requires ongoing monitoring and review to ensure it is effective and working as intended (Gillies & Broadbent, 2008). This review process should be integrated not just into the strategic IT governance level but at all IT management levels that express the strategic IT plan into operational reality (Gillies, 2008). The maturity of IT governance in universities has been found to be low (Pirani & Yanosky, 2005). The importance of IT governance has, however been well recognised and the benefits of an effective structure highly regarded (Allison et al., 2008 ). To this end many universities have identified serious issues in their governance activities and sought to correct them. These include for example, Cornell University (Blustain & Goldstein, 2004), Berkley (Spicer & Pirani, 2008), Curtin University of Technology (Bhattacharjya & Chang, 2007), University of Sydney and Queensland University of Technology (Cater-Steel, 2009) to name but a few. These case studies have largely been considered in isolation, with no linkage to similar experiences in other case studies and with a focus on the individual solutions. This research addresses this gap through considering multiple case studies with a focus on the common elements motivating the reviews and the principles guiding the restructures that have occurred.

Complex, decentralised organisations, such as universities, need to conduct regular reviews to update their IT governance structures to take into account changes in technology and the business environment. When this does not occur, these organisations run the risk of increasingly "organic" IT services that evolve over time, leading to inefficiencies and other issues (Voloudakis, 2010). Effective IT governance is dynamic and flexible in nature, needing to be revised to reflect changes in technology and the business environment (ISACA IT Governance Institute, 2005). The key constructs and mechanisms of IT governance employed in any organisation will vary according to the particular characteristics and needs of the organisation (Weill & Ross, 2004a). This is also applicable to universities with no one particular structure or group of mechanisms universally suited for IT governance (Young, 2004). For this reason the research does not attempt to stipulate or describe any particular structure as being desirable, but merely suggests a coherent and comprehensive group of governance mechanisms need to be in place for IT governance to achieve quality outcomes (Weill & Ross, 2004a). That is effective IT governance in universities will not happen by accident but will be the result of a planned implementation. To determine the quality of outcomes requires the collection and analysis of performance data on an ongoing basis (Gillies & Broadbent, 2005). The performance levels and other IT issues that are evident in the review process are then addressed by the revision and adaptation of the IT governance mechanisms that are in place, similar to the three step

integrated approach espoused by CoBIT 4.0 (ISACA IT Governance Institute, 2005). Many of the performance criteria, particularly for strategic initiatives, will of necessity be long term and the IT governance cycle itself, although dynamic, is also long term.

### **3. Research method**

The research involved the examination of IT governance structures and related issues at eight public universities in Australia. Interviews of key IT personnel, business executive, and functional area representatives were conducted in each of the case study universities. Data was also collected through document and website searches. From the interviews and other artefacts collected the IT governance structure and process was mapped and analysed. The case studies, including a pilot study, were selected on the basis of theoretical sampling. Two case studies were selected from each of the four categories of Australian universities identified by Marginson and Considine (2000). This gave a range of case studies covering the full ambit of the different types of public universities in Australia. These were Unitechs, New Universities, Gum Tree Universities, and Sandstone, including Redbrick, Universities (Marginson & Considine, 2000). Table 1 gives an outline of the characteristics of these categories.

A case study approach was selected as it permits a variety of sources, data, and research methods to be engaged by the researcher, allowing a thorough and flexible approach (Denscombe, 1998). Yin (1994) considered that case studies are particularly suited to exploring contemporary events. An advantage of case studies as their suitability to capturing emergent and rapidly changing phenomenon, such as IT governance, in dynamic organisations (Baharein, 2008). The first case study was used as a pilot study to refine and finalise the case study protocol through semi-structured interviews with staff involved in the governance of information technology.

The personnel interviewed in each case study are shown in Table 2. In total fifty five interviews were conducted. The CIO, the executive responsible for IT, and representatives from the two core functional areas of research and teaching were interviewed at each case study. Case study 5 (CS5) was the exception where the executive responsible for IT at the university declined to be interviewed. Dependent on the universities IT and organisational structure and size other personnel were interviewed. The purpose of interviewing the selected personnel was;

1. Chief Information Officer (CIO). The purpose of interviewing the CIO is to gather background information on the nature and scale of the IT operations. In particular IT governance mechanisms and issues used and experienced within the university.
2. The executive to whom the CIO reports. The purpose of interviewing the executive to whom the CIO reports is to determine any areas of concern within the IT governance structure and to gain a high level view of the relationship between corporate governance and IT governance within the university.
3. Research representative. The purpose of interviewing a representative of the research function will be to determine the degree of participation of the research function in the process of IT governance. The effectiveness of IT governance from the perspective of the research function will also be discussed.

	<b>Category</b>	<b>Characteristics</b>
1	Unitechs	<ul style="list-style-type: none"> <li>• Formerly institutes of technology.</li> <li>• Established post 1986.</li> <li>• Large and relatively centralised.</li> <li>• Modern and vocationally orientated.</li> <li>• Responsive to new markets.</li> </ul>
2	New Universities	<ul style="list-style-type: none"> <li>• Formerly Colleges of Advanced Education.</li> <li>• Founded post 1986.</li> <li>• Academic cultures less developed.</li> <li>• Institutional identity rather than discipline based.</li> <li>• More corporate and entrepreneurial.</li> <li>• Prime aim building student load.</li> <li>• Limited research orientation.</li> </ul>
3	Gum Tree	<ul style="list-style-type: none"> <li>• Established 1960's to mid 1970's.</li> <li>• Highly reliant on public funding.</li> <li>• Relatively resource poor.</li> <li>• Poor corporate identity.</li> <li>• Strong and radical academic communities.</li> <li>• Informal and democratic.</li> </ul>
4	Sandstone & Redbrick	<ul style="list-style-type: none"> <li>• Strong reputation.</li> <li>• Strong academic culture.</li> <li>• Traditional, with long history.</li> <li>• Strong commitment to research.</li> <li>• Resource rich.</li> </ul>

**Table 1:** Characteristics of university categories  
Source: (Marginson & Considine, 2000)

4. Teaching representative. The purpose of interviewing a representative of the teaching function will be to determine the degree of participation of the teaching function in the process of IT governance. The effectiveness of IT governance from the perspective of the teaching function will also be discussed.
5. Other staff either from the IT or other areas was interviewed as required to elaborate on any issues that required clarification. Additional interviews largely depended on the size of the university and the complexity of its IT functions and organisational structure.

The data was organised and analysed according to a number of research themes. These included: Profile of the university, IT governance structure, Degree of centralisation of IT decision making, Key IT decision makers, Mechanisms to enact good governance, Principles of good governance, Issues in IT governance, Alignment with business strategies, Efficient use of resources, IT risk management, and Performance measurement. All data collected was analysed in respect of each case study individually, across the case studies, and collectively for all case studies combined.

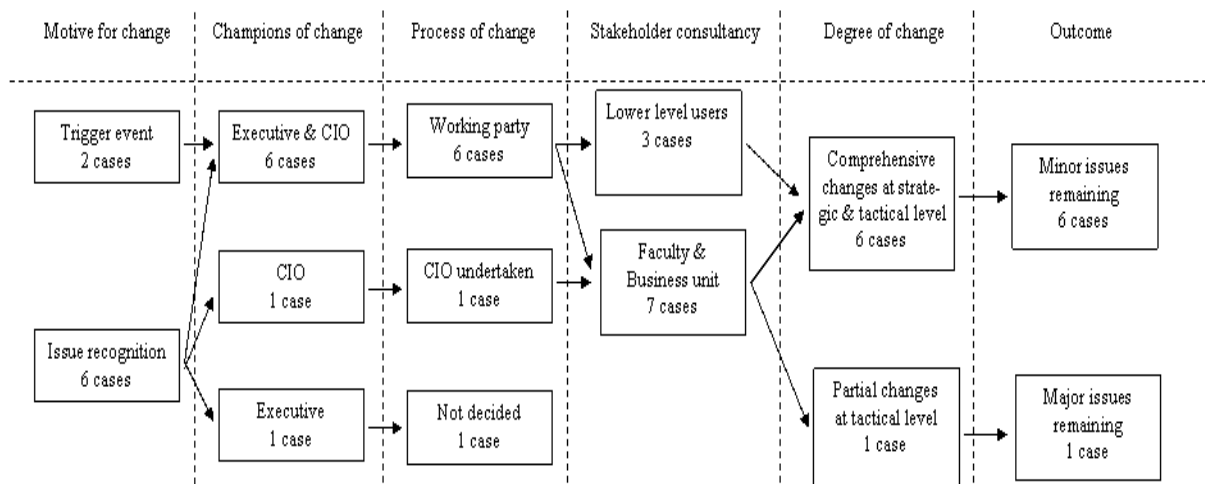
No.	Interviewee	Unitechs Universities		New Universities		Gum Tree Universities		Sandstone Universities	
		CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
1	CIO or equivalent	Y	Y	Y		Y	Y	Y	Y
2	Executive to who CIO reports	Y	Y	Y	Y		Y	Y	Y
3	Teaching representative	Y	Y	Y	Y	Y	Y	Y	Y
4	Research representative	Y	Y	Y	Y	Y	Y	Y	Y
5	Other IT staff	Y			Y		Y	Y	Y
6	Other faculty staff		Y				Y		
7	Other		Y		Y				Y

**Table 2:** Interviewees by function and case study.

## 4. Results

Six of the eight case studies were found to have commenced or recently completed wide ranging reviews of their IT governance process and subsequent major restructures. The restructures involved the implementation of a comprehensive and coordinated group of mechanisms to improve the level of IT governance. These mechanisms are wide ranging and although in many cases similar, they have subtle differences to suit the particular characteristics of the implementing institution. The common element in the six case study universities is they each have a detailed plan of the final governance structure. These proposed structures have been discussed with the faculties and other constituents and, most importantly, supported by the university executive. In all cases where reviews had commenced there was strong support from the university executive. This was typically illustrated by the comment from the Vice President Resources of CS1: “There has been and is strong support from the Vice Chancellor for the changes in IT. I suspect at first it was seen as potential source for cost saving.”

The broad review procedures followed by the case study universities are shown in Figure 1. One university has recognised the need for change but had not at the time of the research committed to a particular process of change. Two of the case study institutions had suffered embarrassing and widely publicised IT system failures. These failures became the catalyst for the widespread review of IT in those institutions. These two universities were also already aware of other significant IT governance issues.



**Figure 1:** Process of review of IT governance in the case study universities.

The motivation for change in the other case studies was primarily recognition of significant issues with the IT governance structure. The most quoted issues were an overall lack of control and accountability in IT, executive pressure to reduce or at least justify expenditure on IT, and insufficient IT risk management. Many of these issues were seen as the result of decentralisation of the IT function with faculties and in some cases schools, responsible for IT in their areas. All CIO's felt this had led to duplication of IT resources, inconsistent IT architecture, and IT expenditure that could not be traced or even identified.

The Deputy Vice Chancellor Academic (DVC) of CS2 emphasised the problems: "Everyone was holding me accountable and I realised I controlled twenty-two million, there was another thirty million [IT resources] out there of which I had no control and people doing what they want. .... Now [under shared services] all money and all people report through the CIO to me."

The CIO's at the six case study universities revising their IT governance structure supported this sentiment. Each stating that prior to the reviews and subsequent changes their university could not identify how many staff were employed in IT and could not identify total expenditure on IT with any degree of confidence. Other major issues identified by each of the case studies prior to their reviews were:

- Lack of accountability for the decentralised IT operations;
- Inefficient use of IT resources, including widespread duplication;
- Failure of IT to support the core business activities of research and teaching; and
- Lack of management of IT risk in the decentralised IT operations.

The review process, as shown in Figure 2, represents a deliberate and formal undertaking conducted on a university wide basis over a long period. This required the cooperation and support of multiple faculties, particularly in the institutions that have retained relatively decentralised IT structures. The necessity for such support was illustrated in every case study by comments such as that by the CFO of CS3: "But in the absence of there being a burning bridge and typical of a university where even a CEO can't state how things are going to be necessarily. He can't tell people how things are going to be. You rely on people [Faculties] agreeing that this is the most sensible thing to do."



**Figure 2:** The IT governance review process.

The need for support appeared to be founded in the traditional independence exerted by the faculties. Although somewhat eroded over time (Marginson & Considine, 2000), faculty power was still a factor in IT governance reform efforts. This was evident in each case study but more so in the research intensive universities. An example of faculty influence was given by CS2 when an early attempt at IT governance restructure was abandoned due to opposition by the faculties. This was described by the CIO of CS2: "In '99 what happened was we called in Ericson they charged us a couple of million dollars to tell us how to move forward. Then when they put that material on the table at the university most schools attacked the figures. You counted him he's only half time, he actually does half



time. We don't count those, we do it this way. Because they didn't have enough time to do an absolute concrete check on the figures. So the culture here was immediately to deny the figures, attack the process to lose credibility and then once you've got that, then the Vice Chancellor says we're not going to do it."

The research findings make no attempt to specify which particular IT governance mechanisms and constructs should be in place. The research found that the specific mechanisms necessary to achieve effective IT governance depended on a number of factors. These are beyond the scope of this study and are likely to vary even in similar situations and organisations. The findings instead suggest that if the overall IT governance structure implemented is appropriate then there should be an improvement in the outcomes. Despite the wide variation of mechanisms used in each case study that has conducted a review there was several common, overarching processes. These were: a formal strategic planning process, an IT Steering Committee either in a decision making or advisory role, appointment of a CIO or equivalent position to take institution wide responsibility for coordinating IT, a comprehensive system for identifying and managing IT risk, and clear roles for IT areas and accountability for IT functions and decisions.

In addition each of these institutions adopted a number of principles in an effort to improve the quality of the IT governance structure. These were:

- A university wide approach to IT governance;
- A single point of responsibility for IT across the organisation, usually the CIO;
- Increased transparency of IT decision making;
- Increased user involvement in IT decision making; and
- Central control or coordination of IT.

Consistent with the literature and the research model the eight case study universities identified the three outcomes of alignment, resource utilisation, and risk management, as the predominant areas they expected their IT governance structures to benefit. Issues such as reducing costs, increasing transparency of IT decision making, and mechanisms to promote user relationships were seen to contribute to the more efficient and effective use of IT resources. Alignment of IT with business objectives was commonly enhanced by initiatives such as an IT Steering Committee, use of an IT strategic plan, processes to engage users in decision making, matching of IT and business planning cycles, and high level support for IT. IT risk management was found to be improved through clear roles and accountability for IT areas, and a CIO or equivalent responsible for IT across the institution.

In each of the case studies the effectiveness of the IT governance structure in place was through the gauging of the level of achievement of the three outcomes shown. Whether such outcomes are at an acceptable level depends on the degree of effectiveness the organisation has established as its ultimate goal. This included determining the balance between the outcomes the universities wished to achieve. The research found the setting of the target balance between the outcomes was based on organisational constraints, such as financial and other resources available, internal politics and the degree of importance placed on research. For example, in the more research orientated case studies there was a clear emphasis on alignment with research needs with a corresponding reduction in the emphasis on the efficient use of IT resources. This was manifested through the more decentralised IT governance structures adopted by these universities.

The success of the assessing or measurement function shown in the model is dependent on firstly the collection of performance measures and secondly the assessment of those measures by someone with the authority to act on the results or to refer those results to a

body that can action them. The collection of performance measures related to the IT governance process was found to be relatively immature in most of the case study universities. This appears to be due to the early stages of restructuring the IT governance structures of the case studies. Performance measures used in the case study universities include intangible and qualitative factors such as feedback from faculties and other constituents, internal and external audit reports, exception reporting when governance issues arise, and IT strategic progression compared to plan. These measures are in the majority of case study universities reported to the CIO or equivalent, in a minority of cases to the executive responsible for the IT function. In two of the case study universities the action the person to whom the measure is reported is limited in the response that can be taken due to a lack of executive support for the strategic IT function.

Responses to performance measures include reviewing and adapting the mechanisms and constructs that have previously been implemented. This involves analysing the gap between the level of outcomes attained and the target level. In some areas such as alignment of IT with business goals, the review and adapting of the IT governance mechanisms was found to be long term. This is evident in the six case study universities that have commenced reviews and restructures of their governance structures, without exception this has been a long term activity. This was equally applicable to the two case study universities that suffered a „trigger“ event although both reported the process was accelerated by the event.

## **5. Conclusion**

The research found that the case studies share a common history of IT governance that resulted from an unplanned evolution that led to a number of significant governance issues. Each of these institutions is aware of the problems and has, or plans to conduct a comprehensive review and ultimate restructure of their IT governance. This review process is mapped in Figure 2. A major consideration in the moving reviews forward was the support of the executive and the support of at least the majority of faculties. Evidence suggests without firm support in both these areas the reviews and restructures would not have moved forward.

While the IT governance mechanisms and constructs employed within each case study university are similar and have much in common they are all at least subtly different. The key common overarching elements found in all of the case study universities is the concern for improving alignment with the business strategies, improving the efficient use of IT resources, and improving IT risk management. Specifically, cost control was universally mentioned as a principal selling point of the reviews, though with less emphasis in the resource rich Sandstone institutions. In all cases the performance monitoring and feedback of IT governance activities and as a whole, appears relatively immature. This appears to be a major contributing factor to the delay in resolving emerging issues in the governance structure until they were inescapable.

In conclusion it is apparent from the research that the case study universities are experiencing a growing awareness of the importance of IT governance and in most cases are currently in a period of reviewing or restructuring their IT governance structures. The reviews are a deliberate and formal process encompassing IT throughout the various institutions. The overarching aims of the reviews are the same in each case study, though the actual implementation and mechanisms used to enact effective IT governance differ. Above all there is recognition in the universities that the structure in place needs to be

workable and not just a theoretical paper based exercise undertaken to placate the auditors and executive management.

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