

THE EFFECTIVENESS OF THE IT MANAGER IN THE INSTITUTES OF TECHNOLOGY IN IRELAND

By

Aidan McGrath BSc., MA.

**Submitted in Fulfilment of the Doctorate in Business
Administration**



Waterford Institute of Technology

School of Business

Waterford Institute of Technology

Research Supervisor: Prof. Frederic Adam

Submitted to Waterford Institute of Technology

November 2014

DECLARATION

The author hereby declares that, except where duly acknowledged this thesis is entirely his own work.

This thesis is not one for which a degree has been or will be conferred by this or any other university or institution.

Signed: _____

Aidan McGrath

November 2014

Acknowledgements

I would like to thank Waterford Institute of Technology for their continued support throughout the course of this study.

I would also like to sincerely thank Prof. Frederic Adam of University College Cork, my supervisor for this work, for his prolonged encouragement and support, insightful questions and guidance whenever it was needed.

Each and every colleague in the School of Business at WIT who had any connection with this program are truly worthy of gratitude for their professionalism in delivering all modules on the program and being available at short notice to discuss any dilemma that may have arisen. It can often be perilous to single out an individual amongst a group of colleagues, but in this case I feel it necessary to extend a special thank you to Dr. Felicity Kelliher who set the standard in supervising this type of program and who unceasingly went the extra mile to keep everyone on track.

Class comrades were a constant source of support and encouragement too through First Friday meetings and general sharing the pain stories at scheduled classes, I thank you all.

Finally, I would like to extend a heartfelt thank you to my wife Carmel and daughters Lisa and Grace who put up with my many hours of absence over the years while studying and gave unending support through periods of doubt and encouraged me on to the very end – thank you.

Table of Contents

Acknowledgements	i
Table of Contents	ii
List of Figures.....	v
List of Tables	vi
Section 1	1-1
ABSTRACT	1-1
INTRODUCTION & DBA RESEARCH OVERVIEW	1-2
Introduction.....	1-2
Research overview and methods	1-3
Background to the research topic	1-4
Changes in Tertiary Education.....	1-4
Emergence of global markets	1-5
Managerialism in Tertiary Education.....	1-6
Evolution of the role of IT Manager.....	1-7
Research Aims	1-11
Thesis Outline.....	1-12
Section 1: Introduction & DBA Research Overview	1-12
Section 2: Cumulative Paper Series	1-12
Section 3: Conclusion and Recommendations.....	1-12
References.....	1-13
Section 2.....	2-1
Paper 1: Conceptual Model	2-1
Abstract	2-1
Introduction.....	2-2
The Role of a Manager	2-3
Evolution of IT Managers	2-4
The IT Manager	2-5
The Role of the IT Manager in IoTI.....	2-9
Leadership and the IT Manager	2-11
Measuring IT Performance and the IT Manager	2-12
Conceptual Framework Model	2-14
Methodology	2-15
Conclusions.....	2-16
References.....	2-17
Paper 2: Methodology	2-24
Abstract	2-24

Introduction.....	2-25
Research Objective	2-25
Research Strategy	2-26
Paradigm Questions	2-30
Methods	2-32
Research Protocol.....	2-36
Conclusion	2-38
Appendix A: Interview Guide	2-39
References.....	2-44
Linking Narrative.....	2-48
References.....	2-51
Paper 3: Philosophy	2-52
Abstract.....	2-52
Introduction.....	2-53
Is there a truth which can be uncovered? (Ontology)	2-54
What evidence is required to support the truth? (Epistemology)	2-55
Human Nature and Methodology	2-56
Unit of Analysis	2-58
Communities of Practice.....	2-58
Approach to data analysis	2-60
Conclusion	2-62
References.....	2-64
Paper 4: Findings	2-69
Abstract.....	2-69
Introduction.....	2-70
Findings	2-71
Online Survey.....	2-71
Interview Findings.....	2-75
Scope of the Role.....	2-76
Issues Critical to Success.....	2-78
Performance Metrics	2-79
Challenges	2-81
Relationship with Senior Management	2-83
Importance of Information	2-84
Online Survey Opinion	2-85
Performance and Value Metrics.....	2-85
Communicating Value	2-86
Discussion	2-87
Role of the ITM in the IoTI Sector	2-87
Performance Metrics	2-89

Areas for Improvement	2-91
Conclusion	2-96
Appendix A Conceptual Model of IT Manager Effectiveness	2-99
Appendix B List of Participating Institutes.....	2-100
Appendix C New CIO Leadership Survey.....	2-101
Appendix D Interview Guide	2-107
Appendix E Comparison of the Five CIO Roles	2-112
Appendix F Peppard <i>et al.</i> , Five States	2-113
Appendix G The Portfolio of Metrics.....	2-114
Appendix H Illustrative Quotes from Interviews	2-115
References.....	2-119
Section 3.....	3-1
CONCLUSION AND RECOMMENDATIONS	3-1
Introduction.....	3-1
Summary of Key Findings.....	3-1
Contribution to Theory	3-4
Contribution to Practice.....	3-5
Limitations.....	3-6
Conclusions.....	3-6
Recommendations.....	3-7
Innovation	3-8
Business Units.....	3-10
Further Research.....	3-12
References.....	3-13

List of Figures

Figure 1. Nine Core IS Capabilities	1-8
Figure 2: Conceptual Model of CIO Role Effectiveness	2-9
Figure 3: A Framework for Determining the Appropriate CIO Role	2-11
Figure 4: The Portfolio of Metrics	2-14
Figure 5: Conceptual Model of IT Manager Effectiveness.....	2-15
Figure 6: Conceptual Model of IT Manager Effectiveness	2-28
Figure 7: Research Strategies	2-29
Figure 8: Research Protocol Diagram.....	2-37
Figure 9 The Five Mind-Sets	2-59
Figure 10: Comparison of IoTI IT Management with Peer Score	2-72
Figure 11: Role of ITMs in IoTI	2-88
Figure 12: Portfolio of Metrics used by ITMs in IoTI	2-90
Figure 13: Stakeholder Quadrants	2-92

List of Tables

Table 1: Development of CIO Roles and Characteristics	2-6
Table 2: Differences Between Quantitative and Qualitative Research Strategies	2-27
Table 3: List of Topics for Structured Interviews.....	2-35
Table 4 The subjective – objective dimension	2-57
Table 5: Importance of Metrics	2-89
Table 6: Areas for Improvement	2-96

Section 1

ABSTRACT

THE EFFECTIVENESS OF THE IT MANAGER IN THE INSTITUTES OF TECHNOLOGY IN IRELAND

By

Aidan McGrath BSc., MA.

Since the wide scale adoption of computers into all facets of business in the late eighties the spread of information and communications technology (ICT) has been relentless. The person charged with ensuring the efficient running of ICT in the Institute of Technology (IoT) sector in Ireland is the IT Manager (ITM). This study concentrates on the effectiveness of IT management in the sector by identifying from the literature the contributory factors to good IT management and comparing these factors with the practice of ITMs in the sector. The findings indicate a sector which is conservative in its approach to the introduction of new technologies and where the demands placed on the ITMs in the sector and the expectations of the role leave room for improvement if ITMs are to operate at optimum levels of effectiveness. All IT Managers, currently working in an Institute of Technology, were contacted to answer surveys based on ITM leadership. This was followed up with face-to-face interviews with all ITMs at their own workplaces to discuss various aspects of IT management including the scope of the role of an ITM, challenges faced, issues critical to success and most appropriate key performance indicators (KPIs) to measure the effectiveness of the ITMs within each organisation. The aim of the study is to measure the current effectiveness of IT management in the sector and to propose a more general instrument to determine IT management effectiveness.

Keywords: IT Management effectiveness, leadership and measurement.

INTRODUCTION & DBA RESEARCH OVERVIEW

Introduction

In Ireland in the late 1960s, the Government was seeking ways to support the establishment of a greater manufacturing base in an attempt to steer the largely agricultural based economy of the time out of recession. One support mechanism proposed was the establishment of a series of Regional Technical Colleges (RTCs) dispersed around the country that could provide technical training for school leavers in an attempt to satisfy the growing need for greater technical skills in the workplace (Clancy, 2008). The first Colleges formally opened their doors in 1970. Originally administered by the country's network of Vocational Education Committees (VEC)¹, they were later charged with responsibility for their own administration and given autonomous powers under the Regional Technical Colleges Act, 1992².

When autonomy from the VECs was achieved, the RTCs started off life with a prescribed management structure which was based largely on a traditional University style administration. Some of this was a continuation of the old structure whereby academic departments, each with a Head of Department, were grouped into clusters which formed Schools, each of which had a Head of School who sat at the top management table and formed part of the senior management team (SMT). Heads of Department formed the core of the middle management structure and reported to their respective Heads of School. The previous Chief Executive Officer (CEO) of the organisation called the Principal remained the CEO but changed title to Director. Other senior managers were assigned: Registrar, the most senior academic in each organisation, Secretary/Financial Controller and Head of Development. At middle management level, new posts were created, primarily to take over the functions previously carried out by the VECs, but in some cases to add more expertise to the management structure. These were: HR Officer, Estates' Officer, Finance Officer, Librarian, Administration Officer and Computer Services Manager. Of these new middle manager roles, the Computer Services Manager stood alone in not having a natural reporting structure into the top management team and ended up being divided between reporting into the Registrar in roughly half of the IoTs with the remainder reporting to the Secretary/Financial Controllers. Thus from the very beginning it was clear that there was a need for a management post responsible for implementation of computer systems in the Colleges but it was unclear where in the organisational structure to place the post. Further to the creation of the managerial structure in the RTCs a review of the posts was carried out in 2000 by Chapman, Flood and Mazars, now just known as Mazars³, which recommended some

¹ VECs are statutory education bodies established along the lines of local education authorities with governing committees elected by the local authorities. <http://www.ivea.ie/>

² <http://www.irishstatutebook.ie/1992/en/act/pub/0016/index.html>

³ Consultancy firm with over 30 years' experience in professional services including audit and assurance, consultancy, corporate finance and taxation services. <http://www.mazars.ie/>

changes to the administration structures of the IoTs and which also included changes at middle management grades such as inter alia changes of titles from HR Officer to HR Manager, Estates' Officer to Estates' Manager and Computer Services Manager to IT Manager.

A further change of status to the Colleges occurred in the late 1990s when the RTCs developed from being Regional Technical Colleges to become Institutes of Technology (IoT). There are thirteen IoTs, which were designated under the Regional Technical Colleges Act 1999 (HETAC, 2006) offering programmes at degree, national diploma and national certificate levels in a wide variety of subjects from craft to professional level. Eleven of today's Institutes of Technology were formerly Regional Technical Colleges and were upgraded to Institute of Technology status in 1997 and 1998. Programmes in most of these institutions are validated by the Higher Education and Training Award Council (HETAC)⁴. HETAC was established by the Government in June 2001, under the Qualifications (Education and Training) Act 1999 and took over the validation of awards from the previous body; the National Council for Educational Awards (NCEA) (HETAC, 2012). HETAC awards qualifications and sets and monitors standards at all levels of higher education and training up to PhD level. Since then, many IoTs have achieved delegated self-awarding powers to make awards up to PhD level.

The aim of this study is to examine the effectiveness of the role of the IT Manager (ITM) in tertiary education and using the posts in the Institutes of Technology in Ireland (IoTI) to assess the role and the level of contribution that is made through ITMs to the overall running of the Institutes. To do this a measure of effectiveness is first developed and used to measure how effective the ITMs in the IoTI sector currently are with recommendations for improvements based on the findings and on the literature in the field.

Research overview and methods

The purpose of this study is to assess the effectiveness of the role of the IT Manager in the Institutes of Technology in Ireland. To do this an instrument is developed which uses existing literature on ITM and Chief Information Officer (CIO) effectiveness to determine the current ITM effectiveness in this sector and to make recommendations on how this might be improved post assessment.

The study concentrates on three pillars of IT Manager effectiveness found in the literature: CIO Role (Peppard *et al.*, 2011), New CIO Leadership (Broadbent and Kitzis, 2004) and appropriate KPIs applied to an IT Manager to measure performance and ability to communicate IT value (Mitra *et al.*, 2011) which the researcher combines into an aggregate measure of IT Manager effectiveness. From these all ITMs in the sector are contacted to take an online assessment of their leadership skills in advance of face to face interviews to enquire into the roles that they currently play in their Institutes and the most appropriate key performance indicators (KPIs) that they would use to assess the performance of IT in their Institutes. As the results of the

⁴ <http://www.hetac.ie/>

online study can be compared with peer ITMs in the sector globally across ten different components of leadership this score is used to rank the overall performance of IT leadership in the sector. The data gathered during the interviews is then analysed to establish the overall role of IT management in the sector and the KPIs used. Comparing the role of ITMs and KPIs used with the results of the leadership survey establishes areas for improvement with suggestions on how to improve ITM effectiveness offered based on the extant literature.

Background to the research topic

Changes in Tertiary Education

Evidence abounds of Higher Education Institutes (HEIs) and Universities around the world having to change the way that they operate (Brown and Lauder, 1996; Deem, 1998; Winter *et al.*, 2000; Winter *et al.*, 2001a; Meyer, 2002; Cheng, 2004; Roets and Sewry, 2006; Marginson and Wende, 2007; Marginson, 2010; Bakhtiari and Shajar, 2011etc.). There are common themes running through the literature for the reasons that changes were required. These will variously include:

- Globalisation of education.
- The increasing need to attract external funding brought about by tightening national government budgets.
- Implementation of more rigid quality systems to provide greater accountability and transparency.
- Central government directives to increase research to assist in national recovery initiatives
- Greater choices of courses and greater flexibility in how learners interact with Institutes to facilitate part-time learners.
- More emphasis on industry specific courses to attract and retain foreign direct investment.
- Establishment of incubation centres to support start-up businesses.
- Increased participation for underprivileged citizens.

Coupled with the global influences for change, some countries have had other local reasons for change too. Just as in Ireland with the case of the RTCs first of all being removed from the local VECs and charged with running their own affairs then subsequently being given autonomous powers and new titles, similar changes have occurred in Higher Education Institutions (HEIs) in the UK and Australia (Deem, 1998; Simkins, 2000; Winter *et al.*, 2001b). Thus at the same time that world events were causing HEIs globally to change the way that they operated, the IoTs in Ireland were emerging from strict local authority control to find their own way in this changing environment. Organisational structures had been inherited, operational boundaries were being pushed by the more ambitious colleges in the sector and Institutes were beginning to explore new ways of operating. While identifying the existence and reasons for change, nationally and internationally, research also reports that “*Information Systems and Information and*

Communication Technology (IS/ICT) should be playing a supporting role” (Roets and Sewry, 2006, p. 1) in these changes. This study explores whether the ITM role in the IoTI sector is providing this support in its current format or if there might be a more effective way to structure the role or a more effective approach that the ITMs might take to discharging their responsibilities.

Emergence of global markets

There has been much written about the effects that globalisation have had on the management structures and behaviours in tertiary education (Brown and Lauder, 1996; Pratt and Poole, 2000; Cheng, 2004; Marginson and Wende, 2007; Marginson, 2010; Abdoli Sejzi *et al.*, 2011; Bakhtiari and Shajar, 2011). One common feature running through the literature is the change of focus from all levels of management to the point that even the language of middle managers has changed from referring to students and courses to talking about “customers” and “products” (Winter *et al.*, 2000). The understanding is that HEIs around the world are having to reinvent the way that they operate in the face of ever increasing global competition for research funding and students; *“Even as they share in the reinvention of the world around them, higher education institutions, and the policies that produce and support them, are also being reinvented”* (Marginson and Wende, 2007, p. 3). In countries, like Ireland, where new governance structures were established for HEIs, the effects of new governing bodies populated by industry representatives which replaced the largely local politician based governance bodies of the previous administrations were seen as bringing a more industry type focus on operations which replaced the collegiality of old (Deem, 1998) and accelerated the expansion of HE into the global markets with a much more market focus than ever before.

The effects of these changes are clear to be seen in many of the IoTs which since the turn of the 21st century created an International Office with the sole purpose of developing overseas markets for their courses. Where once government-led trade missions abroad were made up of more traditional manufacturing industry, HEIs now began to make an appearance on these missions. Ireland again are not unique in this as for *“certain institutions, especially in the English-speaking world, international operations have become the primary mode of development”* (Marginson and Wende, 2007, p. 5). At inter-governmental level too, international agreements were being negotiated for the first time which supported policies liberalising the trade in services, including higher education, as evidenced in the World Trade Organisation (WTO) negotiations in 2005 in the General Agreement on Trade in Services (GATS) (De Siqueira, 2005; Schofer and Meyer, 2005; Matsushita *et al.*, 2006; Altbach and Knight, 2007). This globalisation of higher education placed even greater demands on information and communication technologies (ICT) and by extension on the IT Managers who had to support the expanding portfolio of applications and services to meet demands such as broad-band Internet provision to off campus locations, mobile phones and 24/7 type operations (Roets and Sewry, 2006; Marginson and Wende, 2007; Glenn and D'Agostino, 2008).

Managerialism in Tertiary Education

With the changing focus of higher education around the world, it was probably inevitable that it would bring with it a new way of managing HEIs. Managers were beginning to be employed for their external market or business experience rather than for their time spent in an academic department or their knowledge of a discipline area. The management of HEIs was increasingly viewed as no different from managing any other type of business or service. “*Thus senior management teams and quality managers may exist side by side with more traditional forms of university administration such as semi-autonomous departments and peer review processes (as in the refereeing of research bids)*” (Deem, 1998, p. 51). The term “Managerialism” was used, sometimes in a negative way, to describe the new business style of approach being imposed by governments and other funding agencies (Deem, 1998; Gleeson and Shain, 1999; Simkins, 2000; Utley, 2001; Meyer, 2002; Marginson and Wende, 2007). This was also driven in many circumstances by the need to do more with less or to get better value for money (Winter *et al.*, 2001b; Roets and Sewry, 2006; Szekeres, 2006).

In spite of the evidence of the existence of a more professional style of manager in HE, arguments against professional management are that HEIs are different organisations and it simply will not work. The argument is largely based on the view that HEIs have structures and processes that are different from business organisations since the focus is not on profit, but on knowledge. The opening of education to global markets has removed this as an argument and as HEIs are information-intensive organisations, they can be compared with other professional organisations such as lawyers’ firms which already benefit from deploying professional managers. Thus they approximate to ‘professional bureaucratic structures’ as described by Mintzberg (1979). This further adds to the legitimacy of reviewing current structures.

The introduction of Managerialism signalled the move from the old classic university style collegiate form of academic management to a new type of management that would not have been out of place in the corporate world (Meyer, 2002). This corporatisation of higher education increased during the first decade of the 21st century which accelerated the move to computerise processes and to make them more efficient and measurable. This in turn led to greater dependency on stable and reliable computer systems which brought the IT Departments in HEIs into the core of all operations in the Institute to the point that if IT systems went down that staff reverted to tasks such as filing and cleaning their desks until systems were restored and more productive activities could resume (Szekeres, 2006). It is also reported that this increased dependency created special problems for the IT Departments and that “*part of the problem is the contradictory message that the university sends—at the same time as it insists on a high level of IT literacy and the implementation of the latest systems, it contradicts this by not providing the level of support or resources that staff clearly feel they need*” (Szekeres, 2006, p. 140). This has obvious implications for the IT Manager charged with managing these facilities.

Further to the expansion of IT in the administrative areas of HE, the academics too have not been immune from the creeping computerisation to overtake the Institutes, with an increasing

number of academics expected to self-manage through the use of IT (Kehm, 2006; Kogan, 2007). This has created a new type of academic and academic manager which has been referred to as a “blended professional” (Whitchurch, 2008); one who possesses both academic and professional backgrounds.. All of which further increases the criticality, importance and reach of the ICT support structures and by extension the ITM who is accountable for maintaining these supports. The genesis of this research was to answer the questions around what IT management effectiveness is and whether ITMs in the IoTI sector in Ireland have kept pace with the changes in the HE environment in which they work.

Evolution of the role of IT Manager

The role of a senior technical manager of some title be it information systems (IS) manager or information technology (IT) manager or information and communications technology (ICT) manager only began to appear in the late 1970s and early 1980s and the “*role was that of a computer knowledgeable technician managing a relatively unimportant “Electronic Data Processing” service function*” (Chun and Mooney, 2009, p. 324). By 1982, four critical success factors for the post had been identified: service, communication, I/S human resources and repositioning the I/S function (Rockart, 1982). In 1982 also the Society for Information Management (SIM) and the Management Information Research Center in the Sloan School of Management at the Massachusetts Institute of Technology (MIT) published a study, on the “*Future Role of the Information Systems Executive*”. In it the authors predicted that “*The role of the information executive will thus become one of a corporate general manager with increasing emphasis in his function on staff-oriented activities*” (Rockart et al., 1982, p. 8). The study further went on to predict the important personal attributes that a successful CIO must possess which included; political awareness, organisational and communications skills, be part of the top management team, must be able to manage technological experts, must have appropriate human resources (HR) management skills, be a strategic planner and change manager. Thus it is clear that already this new role was changing with an emphasis on increasing the influence of the post to the point where ITMs would be considered natural successors to the CEO.

Expanding on Rockart’s 1982 studies, in 1998 the critical success factors were expanded to capture the growing role of the CIO so that by the turn of the century nine core capabilities were identified for a CIO: leadership, business system thinking, relationship building, architecture planning, making technology work, informed buying, contract monitoring and vendor development. These capabilities were categorised into three areas of activity: business and IT vision, design of IT architecture and delivery of IS services. These roles are illustrated in Figure 1 and show how much the role of ITM had developed in the space of 20 years since the original posts were established to simply make technology work.

Further research later in the first decade of the 21st century confirms that the original function of the IT or IS department was not seen as a top management level one, but that things were changing; “*The title of CIO was introduced in the mid-1990s to describe a new type of IS*

executive who had been elevated to a C-level position within forward-thinking firms; they were given stewardship of the firm's entire information resources" (Chun and Mooney, 2009, p. 324). In the 1990s also, extra duties and responsibilities were added to the role of ITMs/CIOs which accounts for their elevation to the top management team in organisations. Functions such as: strategic technology planning and control, IT architecture management, IT standards development and human resource management were now being added which brought with them extra challenges (Feeny and Willcocks, 1998). Up to this IT was seen as a sub function of an organisation but now, with the emphasis on leadership and strategic planning, it was brought into the very heart of decision making.

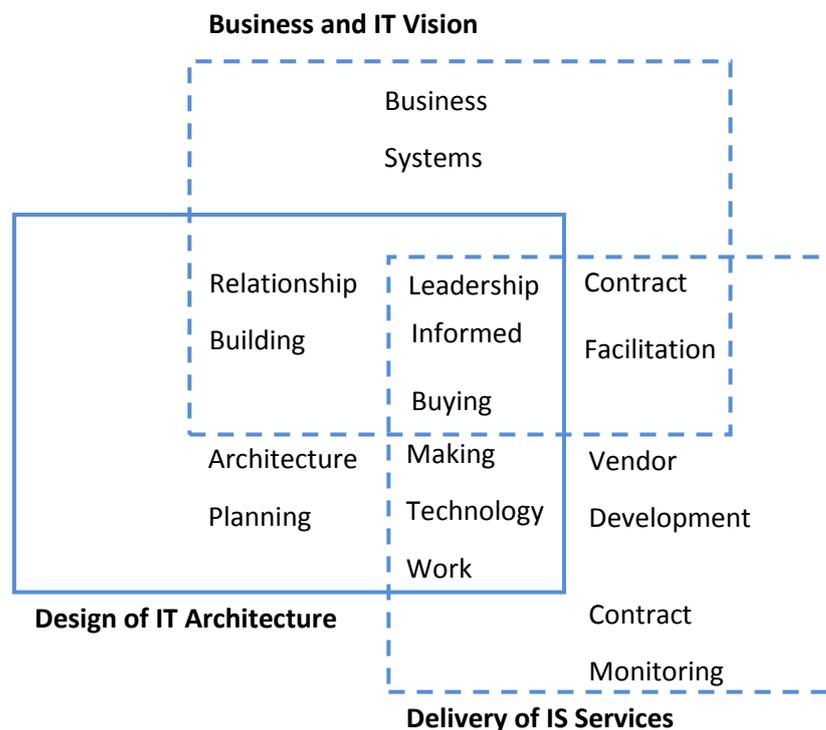


Figure 1. Nine Core IS Capabilities (Feeny and Willcocks, 1998)

Thus from the 1990s there is an emergence of articles published on the effectiveness of the Chief Information Officer (CIO) which became the more common way of referring to an IT Manager. This was around the time that the post of IT Managers were created in the Regional Technical Colleges of the day and leads anybody researching the subject of effectiveness of IT Managers to use the literature on CIO effectiveness interchangeably with IT Manger effectiveness. There are many definitions of a CIO but a particularly good one, which is used for this research is; *“the most senior executive responsible for identifying information and technology needs and then delivering services to meet those needs”* (Broadbent and Kitzi, 2004, p. 5).

If the core competencies of a CIO at the turn of the century were those reported in the literature at the time, was that enough to ensure effectiveness of a CIO – simply employ one who ticked all

these boxes and you were guaranteed success? Research suggests that a lot depends also on the alignment of IT with business needs and the IT maturity of an organisation too (Luftman, 2000; Bassellier *et al.*, 2001; Gottschalk, 2002; Pereira and Sousa, 2005; Karahanna and Watson, 2006; Haes and Grembergen, 2008). IT is not like a precious stone where the value is to be had in its possession, with IT the real value is to be had in effective deployment of the resources. Therefore it was recognised that in spite of hiring competent ITMs/CIOs that their effectiveness would be curtailed if the IT maturity of the organisation hiring them propagated an environment in which they were not allowed to achieve their potential in terms of strategic contribution to the business but only allowed to perform at an operational level of responsibility.

Building on these previous studies, a seminal article on CIO roles effectiveness appeared in 2006; “*The Antecedents of CIO Role Effectiveness in Organizations: An Empirical Study in the Healthcare Sector*” (Smaltz *et al.*, 2006). Even though it is set in the healthcare sector it can and has been applied to the HE sector too; “*CIO Effectiveness in Higher Education*” (Brown, 2006). Smaltz *et al.*, identified four significant skills which effective CIOs must possess, as illustrated in Figure 2. These are: political savvy, communicative ability, strategic business knowledge and strategic IT knowledge. However this study also highlighted the importance of the role of the top management and external environment in regulating the effectiveness of the ITM/CIO.

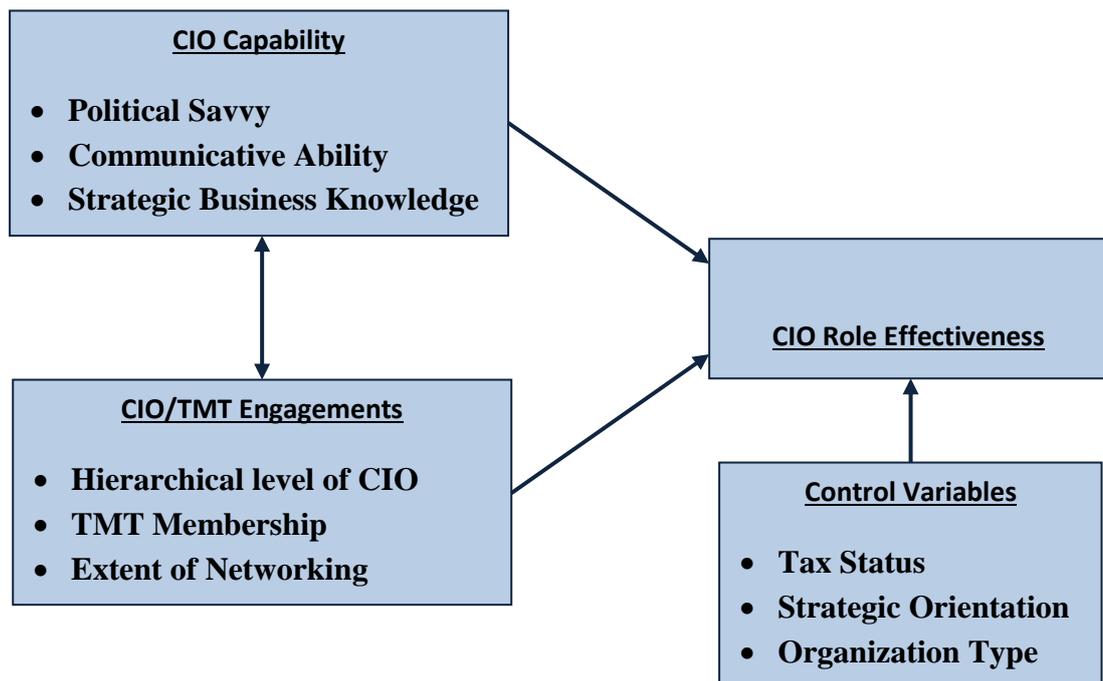


Figure 2. Conceptual Model of CIO Role Effectiveness (Smaltz *et al.*, 2006)

Although not formally published until 2006, the Smaltz *et al.*, study was widely circulated prior to this and was based on data collected in 1999. In 2004, this study was applied to HEIs in the United States when it was reported that the most important roles expected of a CIO in HE were

(in order of importance); classic IT support provider, contract oversight, integrator, informaticist and IT strategist, business partner and IT educator (Brown, 2006). Just like previous studies, the Brown study resulted in a list of competencies expected of a successful ITM/CIO but also further underlined the importance of the environment in which the ITM operates in determining how effective this person can be.

Research has continued since these studies with confusion still being reported about the role of ITM (Marks and Rezgui, 2008; D.S. Preston *et al.*, 2008b; Chun and Mooney, 2009; Hunter, 2010; Peppard, 2010b; Vreuls and Joia, 2011). The main criticism of previous studies is that they could be applied to any managerial role; for example it is hard to argue that any manager in any organisation should not be politically savvy, be able to communicate effectively and have strategic business knowledge etc.

A more recent study; “*Clarifying the Ambiguous Role of the CIO*” (Peppard *et al.*, 2011) took a slightly different approach and involved interviewing a mix of CIOs, CxOs, recruiters, and industry analysts for their views “*not just of their expectations and understanding of the nature of the CIO role, but also the issues they encountered*” (Peppard *et al.*, 2011, p. 31). From this study the authors confirm that there is indeed ambiguity surrounding the role of ITMs and construct a five-point scale to identify which role the organisation in which the ITM is working expect the manager to fulfil. This begins to identify that which is unique to the role of ITM and to address issues of effective IT management. Another study published in the same year; “*Measuring IT Performance and Communicating Value*” (Mitra *et al.*, 2011) takes a different approach to effective IT management by determining which measures out of a portfolio of key performance indicators (KPIs) would be used to measure ITM performance. A framework is constructed to guide ITMs in using more business appropriate metrics to describe performance and to extend ITM influence and raise effectiveness.

In the field of management there has been much written about the links between management and leadership and how management performance can be improved through better leadership (Hersey and Blanchard, 1969; Smircich and Morgan, 1982; Blanchard *et al.*, 1985; Mintzberg, 1989; Bolman and Deal, 1991; Carnevale, 1995; Heck and Hallinger, 2005; Srivastava *et al.*, 2006). ITMs are not immune to researchers studying, and continuing to study, improved performance through their leadership qualities (Nelson, 2003; Katz, 2004; Chester, 2006; Marks and Rezgui, 2008; D.S. Preston *et al.*, 2008b; Marks and Rezgui, 2011; McLean and Smits, 2012). To this end a much cited work “*The New CIO Leader: Setting the Agenda and Delivering Results*” (Broadbent and Kitzis, 2004) was published spelling out just how ITMs/CIOs could first of all measure their leadership abilities against peers by using an online survey and then improve their effectiveness through improving their leadership capabilities. By deploying the online survey that is used in this work amongst the ITMs in the IoTI sector to measure their initial leadership rating an assessment can be made of the current state of ITM leadership in the sector. If this is coupled with the five-point progression scale of the Peppard *et al.*, (2011) study and the portfolio of metrics used in the Mitra *et al.*, (2011) study it is possible to

generate a snapshot of the current state of ITM effectiveness in the sector and to draw on previous research for guidance in how to improve it.

Thus, a review of the literature illustrates the changes taking place in higher education internationally, with the consistent themes of globalisation and managerialism emerging and the need for a more corporate type of manager to address these concerns. This is underpinned by the requirements of the national strategy for higher education in Ireland which was released in February 2012 in a document entitled “*Towards a Future Higher Education Landscape*”⁵ which emphasises globalisation and expansion and the need to align leadership, management and governance practices to support these activities. It describes an education system that operates in a complex and changing environment and one that will depend on stable IT systems for success and future expansion. This confirms that HEIs in Ireland are being directed to follow the international examples of globalisation, managerialism, commoditisation and a corporatisation of higher education which has necessitated changing managerial structures in HE in other countries. This study focuses on the effectiveness of IT management in the IoTI sector by establishing the current state of effectiveness of the role and presenting possibilities for improvements based on the findings of previous studies. During the process an instrument is developed which can be used to measure future ITM role effectiveness for further studies.

Research Aims

The aim of this research is to assess the current state of IT management effectiveness in the Institute of Technology sector in Ireland. The environment in which ITMs in the sector operate in has changed considerably since the posts were first created in the 1990s and the span and control of IT has extended beyond the initial considerations when establishing the posts. With a greater emphasis on more professional management structures in higher education globally and with the current climate in Irish HE of increased collaboration and mergers it is timely to review the effectiveness of the roles of the people in the sector responsible for maintaining the information and communications technology infrastructure on which so much depends.

The objective is to construct an instrument to measure the effectiveness of the role of the ITMs in the IoTI sector with reference to peer ITMs as comparators. Available literature in the area will be used to classify the contribution that ITMs make to the strategic goals of the Institutes with recommendations on how to improve effectiveness where appropriate.

⁵ Downloaded from: <http://www.heai.ie/files/TowardsaFutureHigherEducationLandscape.pdf>

Thesis Outline

The thesis is presented as follows:

Section 1: Introduction & DBA Research Overview

Introduction

Research Overview

Background to the Research Topic

The Research Aims

Thesis Outline

Section 2: Cumulative Paper Series

During the course of this research there was a series of colloquiums at which major papers in the cumulative series were presented. There were four papers in all and they are presented in this section to chronicle the path the research took from conception to conclusion. A short linking narrative is included between two of the papers to account for changes in the research strategy. The four topics covered in the cumulative paper series are:

Paper 1: Conceptual Paper

Paper 2: Methodology

Paper 3: Philosophy

Paper 4: Findings

Section 3: Conclusion and Recommendations

Introduction

Summary of Key Findings

Contribution to Theory

Contribution to Practice

Limitations

Conclusions

Recommendations

Further Research

References

- Abdoli Sejzi, A., Aris, B. and Yahaya, N. (2011) 'Virtual University And Globalisation', *Journal of edupres*, Vol. 1, pp. 35-41.
- Altbach, P. G. and Knight, J. (2007) 'The internationalization of higher education: Motivations and realities', *Journal of Studies in International Education*, Vol. 11, No. 3-4, pp. 290-305.
- Bakhtiari, S. and Shajar, H. (2011) 'Globalization and Education: Challenges and opportunities', *International Business & Economics Research Journal (IBER)*, Vol. 5, No. 2.
- Bassellier, G., Reich, B. H. and Benbasat, I. (2001) 'Information technology competence of business managers: A definition and research model', *Journal of Management Information Systems*, Vol. 17, No. 4, pp. 159-182.
- Blanchard, K. H., Zigarmi, P., Zigarmi, D. and Blanchard, K. (1985) *Leadership and the one minute manager: Increasing effectiveness through situational leadership*, Morrow New York.
- Bolman, L. G. and Deal, T. E. (1991) 'Leadership and management effectiveness: A multi-frame, multi-sector analysis', *Human Resource Management*, Vol. 30, No. 4, pp. 509-534.
- Broadbent, M. and Kitzis, E. (2004) *The new CIO leader: setting the agenda and delivering results*, Harvard Business Press.
- Brown, P. and Lauder, H. (1996) 'Education, globalization and economic development', *Journal of Education Policy*, Vol. 11, No. 1, pp. 1-25.
- Brown, W. A. (2006) 'CIO Effectiveness in Higher Education', *Educause Quarterly*, Vol. 29, No. 1, pp. 6.
- Carnevale, D. G. (1995) *Trustworthy government: Leadership and management strategies for building trust and high performance*, Jossey-Bass Publishers San Francisco, CA.
- Cheng, Y. C. (2004) 'Fostering local knowledge and human development in globalization of education', *International Journal of Educational Management*, Vol. 18, No. 1, pp. 7-24.
- Chester, T. M. (2006) 'A roadmap for IT leadership and the next ten years', *Educause Quarterly*, Vol. 29, No. 2, pp. 56.
- Chun, M. and Mooney, J. (2009) 'CIO roles and responsibilities: Twenty-five years of evolution and change', *Information & Management*, Vol. 46, No. 6, pp. 323-334.
- Clancy, P. (2008) 'The non-university sector in Irish higher education', *Non-university higher education in Europe*, pp. 123-145.
- De Siqueira, A. C. (2005) 'The regulation of education through the WTO/GATS', *Journal for Critical Education Policy Studies*, Vol. 3, No. 1, pp. 1-11.

- Deem, R. (1998) 'New managerialism'and higher education: The management of performances and cultures in universities in the United Kingdom', *International Studies in Sociology of Education*, Vol. 8, No. 1, pp. 47-70.
- Feeny, D. F. and Willcocks, L. P. (1998) 'Core IS capabilities for exploiting information technology', *Sloan Management Review*, Vol. 39, No. 3, pp. 9-21.
- Gleeson, D. and Shain, F. (1999) 'Managing ambiguity: between markets and managerialism-a case study of 'middle'managers in further education', *The Sociological Review*, Vol. 47, No. 3, pp. 461-490.
- Glenn, M. and D'Agostino, D. (2008) 'The Future of Higher Education: How Technology Will Shape Learning', *New Media Consortium*.
- Gottschalk, P. (2002) *The chief information officer: a study of managerial roles in Norway*. Published by the IEEE Computer Society.
- Haes, S. D. and Grembergen, W. V. (2008) *Analysing the Relationship Between IT Governance and Business/IT Alignment Maturity*. IEEE.
- Heck, R. H. and Hallinger, P. (2005) 'The Study of Educational Leadership and Management Where Does the Field Stand Today?', *Educational Management Administration & Leadership*, Vol. 33, No. 2, pp. 229-244.
- Hersey, P. and Blanchard, K. H. (1969) *Management of organizational behavior*, Prentice-Hall Englewood Cliffs, NJ.
- HETAC (2006) 'External Review of HETAC' [Online]. Available at: <http://www.hetac.ie/docs/Appendix%205.pdf> (Accessed 17th June 2012).
- HETAC (2012) 'Higher Education and Training Awards Council' [Online]. Available at: <http://www.hetac.ie/> (Accessed 18th June 2012).
- Hunter, G. (2010) 'The Chief Information Officer: A Review of the Role', *Journal of Information, Information Technology, and Organizations*, Vol. 52010, pp. 18.
- Karahanna, E. and Watson, R. T. (2006) 'Information systems leadership', *Engineering Management, IEEE Transactions on*, Vol. 53, No. 2, pp. 171-176.
- Katz, R. N. (2004) *Information technology leadership in higher education: The condition of the community*, EDUCAUSE Center for Applied Research.
- Kehm, B. (2006) *Professionalizing Mid-Level Management in Higher Education Institutions*.
- Kogan, M. (2007) 'The academic profession and its interface with management', *Key challenges to the academic profession*, pp. 161.

- Luftman, J. (2000) 'Assessing business-IT alignment maturity', *Strategies for information technology governance*, Vol. 4, pp. 99.
- Marginson, S. (2010) 'Higher education in the global knowledge economy', *Procedia-Social and Behavioral Sciences*, Vol. 2, No. 5, pp. 6962-6980.
- Marginson, S. and Wende, M. (2007) 'Globalisation and higher education', pp. 1-85.
- Marks, A. and Rezgui, Y. (2008) 'IT Leadership in Higher Education: The CIO Candidate', *Management science*, Vol. 54, No. 3, pp. 415-428.
- Marks, A. and Rezgui, Y. (2011) 'IT Leadership in Higher Education: The CIO Candidate', *IT Professional Magazine*, Vol. 13, No. 3, pp. 52-56.
- Matsushita, M., Schoenbaum, T. J. and Mavroidis, P. C. (2006) *The World Trade Organization*, Oxford University Press.
- McLean, E. R. and Smits, S. J. (2012) 'Management, Leadership, and the Roles of the CIO'.
- Meyer, H. D. (2002) 'The new managerialism in education management: corporatization or organizational learning?', *Journal of Educational Administration*, Vol. 40, No. 6, pp. 534-551.
- Mintzberg, H. (1979) 'The structuring of organizations: A synthesis of the research', *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.
- Mintzberg, H. (1989) *Mintzberg on management: Inside our strange world of organizations*, Simon and Schuster.
- Mitra, S., Sambamurthy, V. and Westerman, G. (2011) 'Measuring IT Performance and Communicating Value', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 47-59.
- Nelson, M. (2003) 'The CIO in higher education: Leadership, competencies, effectiveness', *ECAR Research Bulletin*.
- Peppard, J. (2010) 'Unlocking the performance of the chief information officer (CIO)', *California Management Review*, Vol. 52, No. 4, pp. 73-99.
- Peppard, J., Edwards, C. and Lambert, R. (2011) 'Clarifying the Ambiguous Role of the CIO', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 31-44.
- Pereira, C. M. and Sousa, P. (2005) *Enterprise architecture: business and IT alignment*. ACM.
- PRATT, G. and POOLE, D. (2000) 'Global Corporations "R" Us? The impacts of globalisation on Australian universities', *AUR*.

- Preston, D. S., Leidner, D. E. and Chen, D. (2008) 'CIO leadership profiles: implications of matching CIO authority and leadership capability on IT impact', *MIS Quarterly Executive*, Vol. 7, No. 2, pp. 57-69.
- Rockart, J. F. (1982) 'The changing role of the information systems executive: a critical success factors perspective', *Sloan Management Review*, Vol. 24, No. 1, pp. 3-13.
- Rockart, J. F., Ball, L. and Bullen, C. V. (1982) 'Future role of the information systems executive', *MIS quarterly*, pp. 1-14.
- Roets, R. and Sewry, D. (2006) *ICT: Irrelevant to Transformation in Higher Educational Institutions*. Pretoria, South Africa,
- Schofer, E. and Meyer, J. W. (2005) 'The worldwide expansion of higher education in the twentieth century', *American Sociological Review*, Vol. 70, No. 6, pp. 898-920.
- Simkins, T. (2000) 'Education reform and managerialism: comparing the experience of schools and colleges', *Journal of Education Policy*, Vol. 15, No. 3, pp. 317-332.
- Smaltz, D. H., Sambamurthy, V. and Agarwal, R. (2006) 'The antecedents of CIO role effectiveness in organizations: An empirical study in the healthcare sector', *Engineering Management, IEEE Transactions on*, Vol. 53, No. 2, pp. 207-222.
- Smircich, L. and Morgan, G. (1982) 'Leadership: The management of meaning', *Journal of Applied Behavioral Science*, Vol. 18, No. 3, pp. 257-273.
- Srivastava, A., Bartol, K. M. and Locke, E. A. (2006) 'Empowering leadership in management teams: Effects on knowledge sharing, efficacy, and performance', *Academy of Management Journal*, Vol. 49, No. 6, pp. 1239-1251.
- Szekeres, J. (2006) 'General staff experiences in the corporate university', *Journal of Higher Education Policy and Management*, Vol. 28, No. 2, pp. 133-145.
- Utley, A. (2001) 'Outbreak of 'new managerialism' infects faculties', *Times Higher Education Supplement*, Vol. 20.
- Vreuls, E. H. and Joia, L. A. (2011) 'An Exploratory Model for the Relevant Factors Related to the Professional Performance of the Brazilian CIO', *The Electronic Journal of Information Systems in Developing Countries*, Vol. 47.
- Whitchurch, C. (2008) 'Shifting identities and blurring boundaries: The emergence of third space professionals in UK higher education', *Higher Education Quarterly*, Vol. 62, No. 4, pp. 377-396.
- Winter, R., Sarros, J. and Management, M. U. D. o. (2001a) 'Corporate reforms to Australian universities: Views from the academic heartland',

Winter, R., Sarros, J. and Management, M. U. D. o. (2001b) *Corporate reforms to Australian universities: Views from the academic heartland*, Department of Management, Monash University.

Winter, R., Taylor, T. and Sarros, J. (2000) 'Trouble at mill: Quality of academic worklife issues within a comprehensive Australian university', *Studies in Higher Education*, Vol. 25, No. 3, pp. 279-294.

Section 2

Paper 1: Conceptual Model

Abstract

The role of the IT Manager (ITM) was created in the Institutes of Technology in Ireland in the 1990s prior to the widespread adoption of the Internet and before cloud computing had been invented. Also, the environment that IT Managers operated in at the time was less regulated and the demands of the business different to what they have become today. With changes in technologies, budgets, expectations of the role and changes to the work environment as a backdrop, this study charts the changes in the IT Manager role and measures the effectiveness of IT management in Higher Education (HE) today and into the future. All IT Managers, currently working in an Institute of Technology, apart from the researcher, are contacted to answer surveys based on ITM leadership, most appropriate role for an ITM and most appropriate key performance indicators (KPIs) to measure the effectiveness of the ITMs' departments within each organisation. The findings measure the current contribution that ITMs make to the Institutes of Technology with suggestions as to how ITM effectiveness might be improved.

Keywords: IT Manager role, leadership, performance and effectiveness.

Introduction

At the heart of this study is a manager; the IT Manager (ITM) in the Institutes of Technology (IoT) in Ireland⁶. There are thirteen IoTs, which were designated under the Regional Technical Colleges Act 1999 (HETAC, 2006) offering programmes at degree, national diploma and national certificate levels in a wide variety of subjects from craft to professional level. With their evolution in the 1990s came autonomy and a new management structure which included the original Computer Services Managers, now IT Managers, along with other newly created middle management grades e.g. HR Manager and Finance Manager. Roles and areas of responsibilities were assigned to the incumbents of these posts in a pre-internet era and prior to the widespread use of personal computers (PC) and other devices such as mobile phones and laptops. In this study the ITM is defined as “*the most senior executive responsible for identifying information and technology and then delivering services*” (Broadbent and Kitzis, 2004, p. 5) and the aim is to measure the overall effectiveness of IT management in the sector.

During this same period, 1990s to 2000s, there were very many changes to tertiary education worldwide which resulted in accusations of increasing managerialism and the loss of traditional educational management values (Brown and Lauder, 1996; Deem, 1998; Winter *et al.*, 2000; Winter *et al.*, 2001a; Meyer, 2002; Cheng, 2004; Roets and Sewry, 2006; Marginson and Wende, 2007; Marginson, 2010; Bakhtiari and Shajar, 2011etc.) The focus of tertiary education changed from one of local supplier of higher education to one of a business competing for increasingly mobile students in a global market place (Brown and Lauder, 1996; Pratt and Poole, 2000; Cheng, 2004; Marginson and Wende, 2007; Marginson, 2010; Abdoli Sejzi *et al.*, 2011; Bakhtiari and Shajar, 2011). Changes in HE in terms of autonomy, and globalisation plus the profound changes occurring in technology during this same period form the background to the introduction and development of the role of ITMs in IoTs in Ireland.

In HE, as in common with many other sectors, the role of a senior technical manager employed in organisations only began to appear in the late 1970s and early 1980s, and started out as more of a chief technician responsible for keeping the computer running (Ross and Feeny, 1999; Brown, 2006; Smaltz *et al.*, 2006; McLean and Smits, 2012). In the late 1980s and early 1990s, there was evidence that the role was being elevated to a C-level position and the title was changing to Chief Information Officer (CIO) (Broadbent and Kitzis, 2004; Chun and Mooney, 2009; Hunter, 2010; Peppard, 2010a; Marks and Rezgui, 2011). Since the emergence of the CIO in the workplace, the term CIO has taken hold in the literature leading anyone studying the development of the role of the ITM to use the term interchangeably with CIO when researching reference material for their studies.

⁶ Ireland’s Institutes of Technology are flexible and dynamic university-level institutes focused on teaching/learning, purpose-driven research and public service – www.ioti.ie

There have been many studies into managerial roles of the ITM/CIO over the years, some of which have concentrated on individual aspects of the position such as the role of the CIO (Rockart, 1982; Rockart *et al.*, 1982; Penrod *et al.*, 1990; Grover *et al.*, 1993; Todd *et al.*, 1995; Feeny and Willcocks, 1998; Ross and Feeny, 1999; Enns, 2000; Gottschalk, 2000a; b; c; Gottschalk and Taylor, 2000; Penrod, 2003; Lineman, 2006; Smaltz *et al.*, 2006; Chun and Mooney, 2009; Hunter, 2010; Carter *et al.*, 2011; Nicolet, 2011; Peppard *et al.*, 2011; McLean and Smits, 2012). There have also been studies into the characteristics of a good CIO (Kurien and Purushottam, 2004; Rau, 2004; Brown, 2006; Smaltz *et al.*, 2006; H.G. Enns *et al.*, 2007), the assumption being that if you can identify the characteristics of a good CIO then simply employing a person with these characteristics should guarantee a good and effective CIO. Others still have concentrated on the leadership qualities of a CIO (Nelson, 2003; Katz, 2004; Chester, 2006; Marks and Rezgui, 2008; D.S. Preston *et al.*, 2008b; Marks and Rezgui, 2011; McLean and Smits, 2012). This study brings together the learnings of some of the latest studies into the changing roles of the CIO and how to harness these roles effectively for the organisation. Combining the “*New CIO Leader Self-Assessment*” (Broadbent and Kitzi, 2004) with the methods of applying the most appropriate KPIs to a Computer Services Department (Mitra *et al.*, 2011) and further mapping out where the IoTs currently stand in relation to the five distinct CIO roles identified in the literature (Peppard *et al.*, 2011), a measure of the effectiveness of current IT management in the IoTI sector is developed.

The aim of this study is to measure the current effectiveness of IT management in the IoTI sector and to determine whether or not the current structures and roles remain relevant and effective to meet the challenges presented by the changes which have occurred in both technologies and the HE environment in which the IT Manager operates today. It is an empirical study which establishes the importance of the ITM role within the managerial hierarchy of the Institutes of Technology and examines the effectiveness of the role. The results of this study have implications for the recruitment, retention and continuous professional development for IT Managers in the IoTI sector.

To begin with, the role of a manager is described and then applied to ITMs. Then the evolution of the role of the ITM is outlined. Finally the current effectiveness of the role of the ITM in the IoTI sector is analysed by identifying the actual role that the ITM performs in the current structure with the style of ITM leadership being used and the key performance indicators most suitable to assess the effectiveness of the ITM through the services delivered by the department that the ITM leads.

The Role of a Manager

As described by an early theorist; Fayol (1916), the primary role of the manager was to plan, organise, command, coordinate and control (Carroll and Gillen, 1987; Lamond, 2003; Hancock and Tyler, 2004; Lamond, 2004). Later theorists followed (Carlson, 1951; Stewart, 1982) with further theories of the role of a manager (Mahoney *et al.*, 1965; Hales, 1986; Tengblad, 2006; Stewart,

2007; Brunsson, 2008) which attempted to go beyond a simple list of functions to looking for evidence of these activities amongst practicing managers. In 1973 a seminal work; “*The Nature of Managerial Work*” (Mintzberg, 1973), described 10 generic functions of a manager. These ten roles included: monitor, disseminator, spokesperson, figurehead, leader, liaison, entrepreneur, disturbance handler, resource allocator and negotiator. Mintzberg’s findings are not without critics however, the main criticisms being that the sample size was too small to infer universality; three were only five CEOs studied in the original work, coding methods used and external validity checks were also questioned. However, much work has been carried out since the publication of the Mintzberg results to validate or otherwise the findings, but the roles, or some variation of them, have been confirmed as being present in the working lives of all managers (Lau and Pavett, 1980; McCall and Segrist, 1980; Kurke and Aldrich, 1983; Pavett and Lau, 1983; Carroll and Gillen, 1987; Paolillo, 1987; Noordegraaf and Stewart, 2000; Bedeian and Wren, 2001; Lamond, 2003; Tengblad, 2006; Stewart, 2007).

In later studies, these managerial roles were operationalised (McCall and Segrist, 1980) and then applied to the role of an CIO (Grover *et al.*, 1993) to determine whether or not the roles of an ITM are different to the roles of other managers in an organisation. The Grover study was further used to investigate “*the roles of CIOs in terms of the extent to which CIO roles change at varied levels of IS maturity, IS centralization, IS responsibility and IS effectiveness*” (Gottschalk, 2000a, p. 78). The common theme to emerge from the studies is to confirm that CIOs exhibit all the characteristics of a manager and that their jobs require a greater degree of technical expertise than other senior roles in an organisation.

Evolution of IT Managers

In considering the evolution of the role of IT Managers a chronological approach is taken which mirrors the evolution of technology over the same period. The title of the person who carries out the role of the most senior technical manager in an organisation began to appear in the late 1970s and early 1980s and varied among: Information Systems (IS) Manager, Information Technology (IT) Manager, Information and Communications Technology (ICT) Manager and the “*role was that of a computer knowledgeable technician managing a relatively unimportant “Electronic Data Processing” service function*” (Chun and Mooney, 2009, p. 324). The literature also identifies a distinction between a CIO working in the public or private sectors with the public sector CIO having a focus on purchasing rather than providing ICT services (Broadbent and Kitziis, 2004, p. 5).

When studies began into the roles of an ITM in 1982, the four critical success factors (CSF) first identified were: service, communications, I/S human resources and repositioning the IT function (Rockart, 1982). These initial four CSFs point to a service oriented position within an organisation that was expected to effect change through the introduction of new technology by ensuring that the

technology worked and that any change that resulted from the introduction of technology was communicated throughout the workplace. By 1998, the requirements of the ITM had expanded to include: leadership, informed buying, business systems thinking, relationship building, contact facilitation, architecture planning, vendor development, making technology work and contract monitoring (Feeny and Willcocks, 1998). Thus, in a relatively short space of time, the growth of the importance of technology and the ITMs responsible for it had grown considerably.

Various attempts exist in the literature to define what an ITM/CIO is, including:

“The chief information officer (CIO) is the highest-ranking information systems (IS) executive in an organization” (Stephens *et al.*, 1992, p. 451), this concentrates on hierarchy alone.

The CIO is the *“executive who had been elevated to a C-level position within forward-thinking firms; they were given stewardship of the firm’s entire information resources”* (Chun and Mooney, 2009, p. 324), this expands hierarchy to include responsibility,

“The CIO (Chief Information Officer) is the name currently attributed to the executive responsible for the information technology (IT) area of an organization” (Vreuls and Joia, 2011, p. 1); this talks about title and responsibility.

But the one which, to this researcher, captures the essence of a CIO is:

“the most senior executive responsible for identifying information and technology and then delivering services” (Broadbent and Kitzis, 2004, p. 5).

This definition is chosen as it captures the strategic responsibilities of identifying technologies to be deployed in an organisation and by then being responsible to deliver services recognises the importance of procuring and implementing the chosen solution. However, it is a very broad brush and fails to take into account any of the skills, technical ability or business acumen that an incumbent might bring to the post, but is more reflective of the ambiguous nature of the role and how the posts are deployed in different sectors. This study seeks to define the role that IT management in the IoTI sector currently fulfils through survey, interview and comparison with the literature.

The IT Manager

Although Mintzberg’s ten generic managerial roles (Mintzberg, 1973) have been shown to apply to IT Managers (Grover *et al.*, 1993; Gottschalk, 2000a), many other studies have been carried out into CIO role effectiveness without the framework of the Mintzberg roles as a template to compare against (Stephens *et al.*, 1992; Gottschalk and Taylor, 2000; Cartwright, 2002; Enns *et al.*, 2003;

Nelson, 2003; Jackson, 2004; Kelley and Sharif, 2005; Penrod, 2005; Lance, 2006; H.G. Enns *et al.*, 2007; Iyengar, 2008; D.S. Preston *et al.*, 2008a; Seddon *et al.*, 2008; Galloway, 2010; Carter *et al.*, 2011; Nicolet, 2011; Gartner, 2012; McLean and Smits, 2012). A summary table of various articles on the development of CIO roles and characteristics is provided in Table 1. The various studies are presented and categorised into more general headings to identify groupings within the studies.

Table 1: Development of CIO Roles and Characteristics		
Categories	CIO Roles, Characteristics, Expectations, Attributes	Authors
Roles	Service, Communications, I/S Human Resources, Repositioning the I/S Function	(Rockart, 1982)
Characteristics	<ul style="list-style-type: none"> • Must have political, organizational and communication skills • Must be part of the top management team • Must understand and be able to manage technological experts • Must have developed the appropriate HR management skills • Must be a planner with emphasis on strategic planning • Must be sensitive to human, organizational and social impacts of new technology 	(Rockart <i>et al.</i> , 1982)
Leader Roles	<ul style="list-style-type: none"> • Leadership, Planning, Communication/Liaison, Vision, IS Budget Management, Coordination, Technical Expertise, Consensus Building, Problem Solving. • HR Management, Planning/Strategizing, Vendor Relations, Meetings, Budgeting, Keeping Current, Telephone Calls, Crisis Management 	(Penrod <i>et al.</i> , 1990)
Leader Roles	Leader, Spokesman, Monitor, Liaison, Entrepreneur, Resource Allocator	(Grover <i>et al.</i> , 1993)
Roles	Hardware, Software, Business, Management, Social, Problem Solving, Development Methodology	(Todd <i>et al.</i> , 1995)
Leader Roles	Leadership, Informed Buying, Business Systems Thinking, Relationship Building, Contact Facilitation, Architecture Planning, Vendor Development, Making Technology Work, Contract Monitoring	(Feeny and Willcocks, 1998)
Roles	Functional Head, Strategic Partner, Business Visionary	(Ross and Feeny, 1999)
Roles	Foster good relations, gain trust with colleagues, develop skills at influencing	(Enns, 2000)
Characteristics	<ul style="list-style-type: none"> • Most effective CIOs tailor their influence behaviours to TMT • Effective CIOs foster relationships with other executives • Effective CIOs pre-sell ideas informally to TMT 	(Enns and Huff, 2000)
Roles Leader	Chief Architect, Change Leader, Product Developer, Technology Provocateur, Coach and Chief Operating Strategist	(Gottschalk, 2000a) (Gottschalk and Taylor, 2000)

Roles Communicate	<ul style="list-style-type: none"> • Manage relationships with relevant others • Convey relevance and value of IT • Plan and implement IT-based solutions • Trustee, Adapter, Collaborator, Entrepreneur 	(Nelson, 2003)
Characteristics	<ul style="list-style-type: none"> • Take action rather than wait for “the organization” to solve problems • Have high aspirations but be realistic about limitations • Be critical but committed • Be independent but cooperative with others 	(Penrod, 2003)
Leader Characteristics Hierarchy	<ul style="list-style-type: none"> • Higher Education is a calling • CIOs in HE describe a positive work environment • Leadership style matters • Innovation is a key component of successful IT initiatives • Distance from the Executive Suite makes a difference • A seat at the cabinet table is important 	(Katz, 2004)
Accountability	<ul style="list-style-type: none"> • Cost of Effort • Cost of Size • Cost of Downtime • Cost of Replacement • Cost of Quality • Cost of Delay 	(Kurien and Purushottam, 2004)
Roles	<p>Ensuring day-to-day demands for computer services are delivered</p> <p>Effective interactions with the consumers, internal and external</p> <p>Keeping abreast of and selecting new and emerging technologies</p>	(Rau, 2004)
Roles	<ul style="list-style-type: none"> • Reorganise and reshape to deliver ubiquitous and commoditised services • Work with academic and business leaders to develop and align specialised technology services with the institution’s strategic goals 	(Chester, 2006)
Roles	Business Partner, Classic IT Support Provider, Contract Oversight, Integrator, Informaticist and IT Strategist, IT Educator	(Brown, 2006)
Roles Characteristics Hierarchy	<ul style="list-style-type: none"> • Political Savvy, Communicative Ability, Strategic Business Knowledge, Strategic IT Knowledge • Hierarchical Level of CIO, TMT Membership, Extent of Networking Activities, Extent of Trusting Relationships 	(Smaltz <i>et al.</i> , 2006)
Maturity Roles	<ul style="list-style-type: none"> • IS Maturity: IS End-User Maturity and IS Management Maturity • IS Centralization: IS Resource Centralisation, IS Management Centralisation • IS Responsibility: IS Strategic Responsibility, IS Managerial Responsibility, IS Infrastructure Responsibility 	(Lineman, 2006)

Roles	<ul style="list-style-type: none"> Align IT strategy with university vision Oversee university-wide IT governance Manage IT architecture and IT acquisitions Serve on the university's IT steering committee Update IT policies and reinforce the appropriate use of IT Encourage a positive culture at the university towards IT Coordinate initiatives to realise operating efficiencies Direct strategic initiatives to increase online presence 	(Marks and Rezgui, 2008)
Characteristics Roles Hierarchy	<ul style="list-style-type: none"> IT Orchestrator, Laggard, Advisor or Mechanic Strategic IT and Business Knowledge, Interpersonal skills (political savvy and communication ability) CIO reporting level, CIO is a member of the TMT Dedication of resources to IT, Strategic IT vision 	(D.S. Preston <i>et al.</i> , 2008b)
Roles Maturity	<ul style="list-style-type: none"> Oriented and tailored their roles and responsibilities to match the IS infrastructure and strategy of the firm. The CIO has settled into one of two distinctive roles; invigorating the IT infrastructure to achieve ROI or increasing revenue generation with new IS throughout CIOs believed that they could identify and understand the skill-sets needed for their job. Degree to which a firm's IS architecture was standardised had a profound effect on the CIO's ability to change role 	(Chun and Mooney, 2009)
Roles	<ul style="list-style-type: none"> Current issues: soft skills, technical skills Future issues: performance standards, staffing 	(Hunter, 2010)
Leader Roles	<ul style="list-style-type: none"> Business Technology Strategist Informational Role: Spokesperson, Monitor Interpersonal Role: Leader, Liaison Decisional Role: Resource Allocator, Entrepreneur 	(Carter <i>et al.</i> , 2011)
Roles	Five Distinct CIO Roles: Utility IT Director, Evangelist CIO, Innovator CIO, Facilitator CIO, Agility IT Director/CIO	(Peppard <i>et al.</i> , 2011)
Roles	<ul style="list-style-type: none"> Technologist: CTO Enabler: Partnering with user management Innovator: Re-engineering within the I/S function Strategist: Competitive Advantage 	(McLean and Smits, 2012)

One seminal article on the subject of CIO role effectiveness (Smaltz *et al.*, 2006), although set in the healthcare sector has been widely cited across many sectors (Karahanna and Watson, 2006; Napier *et al.*, 2007; Scott, 2007; D.S. Preston *et al.*, 2008a; Mithas and Krishnan, 2009; Preston and Karahanna, 2009; Chen *et al.*, 2010; Jonas, 2010; Menz, 2012) as it sets out the components that combine to determine CIO role effectiveness. These are CIO capability, CIO/TMT engagements and control variables as shown Figure 2

An unpublished version of the Smaltz study was used as the basis of a further study (Brown, 2006), this time in the education sector to apply the same methodology to determining CIO role effectiveness in the higher education sector in the US. The Brown study replicated “*Smaltz's research model as a quantitative and qualitative case study*” (Brown, 2006, p. 50) to determine the

CIO role effectiveness under the headings of: business partner, classic IT support, contract oversight, integrator, informaticist and IT strategist, and IT educator. The study concluded by stating that “*the number and complexity of the issues that the CIO deals with on a regular basis are substantial*” (Brown, 2006, p. 52). Also, the importance of understanding the CIO attributes and a knowledge of the circumstances in which the CIO operates may provide a means of predicting the effectiveness of the current IT leader.

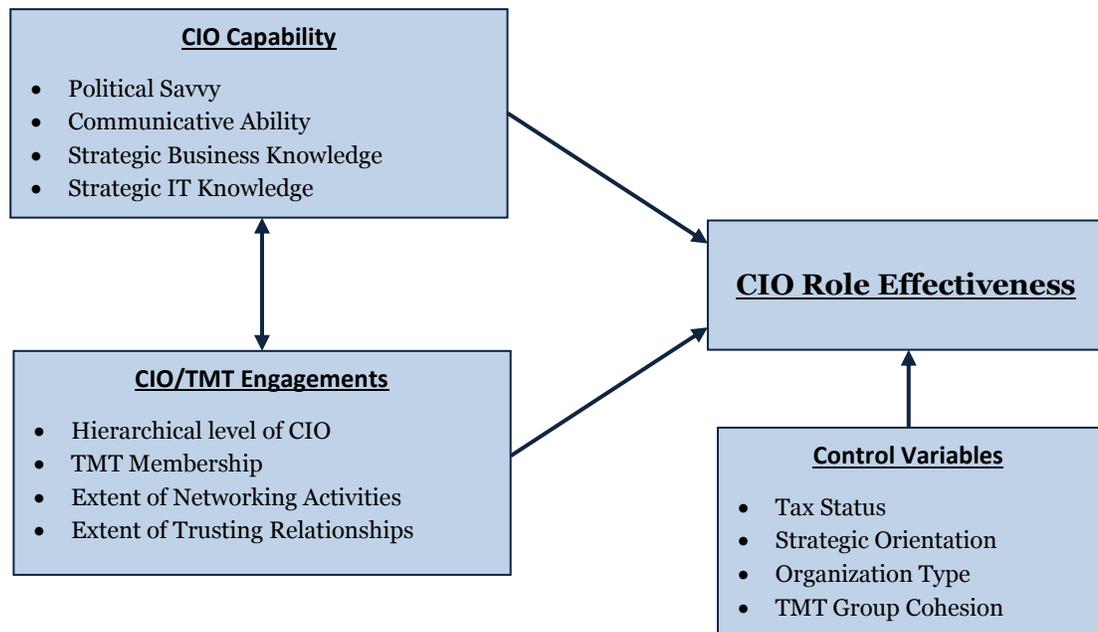


Figure 2: Conceptual Model of CIO Role Effectiveness (Smaltz, 2006)

The Role of the IT Manager in IoTI

From the preceding Smaltz *et al.*, (2006) and Brown (2006) studies, the reader might conclude that there is a ready built template which can be adapted for different sectors to determine CIO role effectiveness. However, research has continued in this field and researchers still report confusion with the role of the CIO (Marks and Rezgui, 2008; D.S. Preston *et al.*, 2008b; Chun and Mooney, 2009; Hunter, 2010; Peppard, 2010b; Vreuls and Joia, 2011). A recent study (Peppard *et al.*, 2011) took a slightly different approach and involved interviewing a mix of CIOs, CxOs, recruiters, and industry analysts for their views “*not just of their expectations and understanding of the nature of the CIO role, but also the issues they encountered*” (Peppard *et al.*, 2011, p. 31). The approach accepts that whatever the roles or competencies of the CIO identified up to now, just like the Mintzberg generic managerial roles, they can be applied to a greater or lesser extent to all other executives in the organisation. For example, it would be difficult to disagree that all CxOs should not

be politically savvy, have good communication skills, engage in various networking activities and build trusting relationships.

The goal was to identify that which was different about the role of the CIO that separated it from all other Chief x Officer (CxO where x could be Technology, Finance, Operations etc.) roles in the organisation. The Peppard *et al.* study identified five distinct CIO roles:

1. Utility IT Director
2. Evangelist CIO
3. Innovator CIO
4. Facilitator CIO
5. Agility IT Director/CIO

In addition to establishing the five distinct CIO roles, the study "*established under what organizational contexts each role would be appropriate*" (Peppard *et al.*, 2011, p. 37). It follows that there would be an appropriate CIO role for various organisations which are determined by two factors:

1. The chosen strategy of the organisation and, in particular, the role that information and technology play in any competitive differentiation.
2. The level (maturity) of information capability in the organisation.

In relation to the second point above, the level of senior management's digital literacy was identified as a major determining factor in the type of role appropriate for a CIO. This emphasis on IT maturity of the top management team (TMT) finds support in the IT governance literature also (Rau, 2004; Weill, 2004; Gammelgard *et al.*, 2006; Ko and Fink, 2010) which agrees that poor levels of IT maturity at TMT can have a disproportionate negative effect on ITM effectiveness.

Each of the five distinct roles are identified by Peppard *et al.* as appropriate to the five distinct states of development of an organisation, or levels of information capability and maturity and are presented in Figure 3.

This shows a progression from State A – Utility IT Director in the bottom left hand corner characterised by low organisation maturity of information leadership capability and low dependency on IT for differentiation in the industry to State E – Agility IT Director/CIO which is characterised by high maturity and dependency on IT for differentiation.

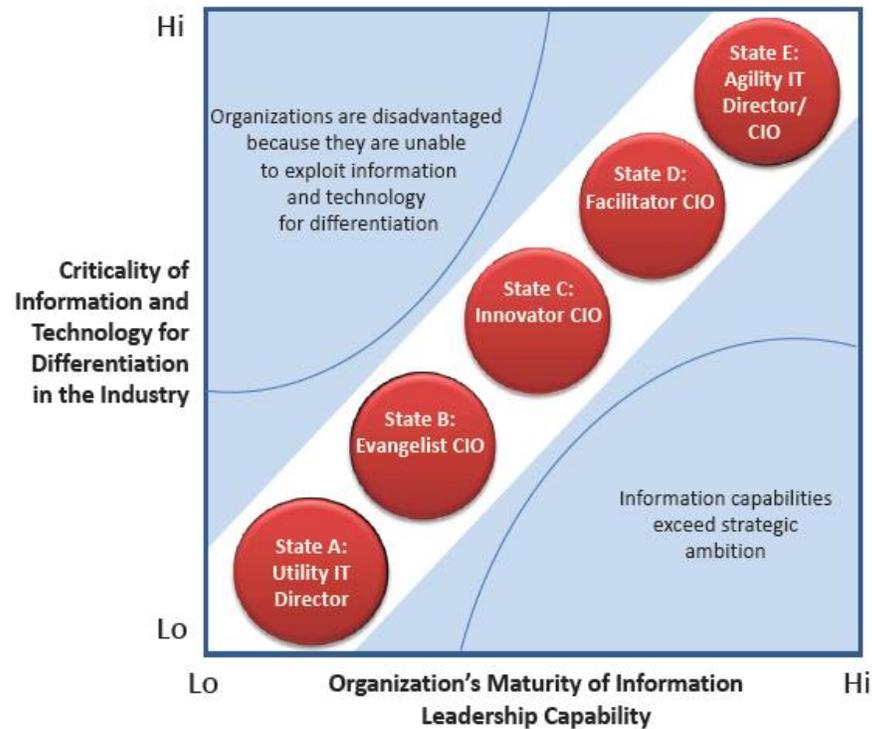


Figure 3: A Framework for Determining the Appropriate CIO Role (Peppard *et al.*, 2011)

The first research question therefore for this study has two parts: (a) establish the level of IT maturity amongst the executive boards working in the IoTI sector and (b) determine the importance placed on IT by each Institute in the sector.

Leadership and the IT Manager

Leadership is one of the ten generic managerial roles identified by Mintzberg in his 1973 study; *“The Nature of Managerial Work”*. “Leadership” or the term “leader” appears more often than any other single attribute in the list of CIO roles presented in Table 1. and yet, *“the concept of CIO leadership capability has not been well developed”* (Peppard *et al.*, 2011, p. 33). Various studies have identified the importance of CIO leadership (Becker, 1999; Sayles, 1999; Gottschalk, 2000b; c; Cartwright, 2002; Nelson, 2003; Katz, 2004; Chester, 2006; Iyengar, 2008; D.S. Preston *et al.*, 2008b; Marks and Rezgui, 2011; Nicolet, 2011; McLean and Smits, 2012) but there is one publication (Broadbent and Kitzis, 2004) which is often referenced by researchers studying CIO leadership (Chester, 2006; Gammelgard *et al.*, 2006; Smaltz *et al.*, 2006; Hanna, 2007; Banker *et al.*, 2011) and which stands out amongst the others for its extensive treatment of the subject.

In this book, the authors present the case that now, more than ever, organisations need CIO leaders who should grow into the role to be “*at the heart of every significant business process and is crucial to innovation and enterprise success*” (Broadbent and Kitzi, 2004, p. 2). The role is so important that in future the authors report that it will not be uncommon for the CIO to be the natural successor to the COO or CEO. This concept of CIOs eventually rising to CEO level is supported by other studies (Ross and Feeny, 1999; Chun and Mooney, 2009). According to Broadbent and Kitzi, current CIOs are at a crossroads between developing into new CIO leaders or watch as their roles are reduced to that of chief mechanic while somebody else takes on the role of new CIO leader. The various steps to take on the journey and the rationale behind each of the steps are explained. Through their research, the authors have identified the top ten priorities of the new CIO leader:

1. Laying the Foundation: Leadership
2. Understanding the Fundamentals of Your Environment
3. Create Your Vision
4. Shape and Inform Expectations for an IT-Enabled Enterprise
5. Create Clear and Appropriate IT Governance
6. Weave Business and IT Strategies Together
7. Build a new IS Organization
8. Develop a High-Performance IS Team
9. Manage Enterprise and IT Risks
10. Communicate Your Performance

The authors include in their work a self-assessment study which they recommend is conducted as a starting point for anybody trying to develop their new CIO leadership skills to benchmark where they are starting from. An adaptation of this self-assessment study is used in this study as a benchmark for IT Managers in the sector to gauge the level of current CIO leadership in the sector. The purpose of the book is to coach perspective new CIO leaders into improving their score on the self-assessment study thereby improving their effectiveness as a new CIO leader.

The second research question for this study will be to establish the type of ITM leadership currently reported in the IoTI sector through an adapted self-assessment study of new CIO leadership.

Measuring IT Performance and the IT Manager

While it is necessary to understand how the role of the IT Manger has developed over the years and how the roles are utilised in the IoTI sector today, and also to understand the types of CIO leadership found in the sector, there is also a need to measure the performance or effectiveness of

what is delivered by the ITMs and the Computer Services Departments across the sector to discern whether or not the roles are delivering value in their current configuration. Many of the conventional tools and techniques available to measure the effectiveness of the IT Department, and by extension the IT Manager concentrate on financial measures such as: return on investment, reduction in costs, increased efficiencies and effects on profit or share value (Weill, 1992; Bharadwaj *et al.*, 1999; Bharadwaj, 2000; Melville *et al.*, 2004), while others have concentrated on the impact on the individual and organisational performance (Torkzadeh and Doll, 1999; Brynjolfsson and Hitt, 2000; Devaraj and Kohli, 2003; Chen and Zhu, 2004). However, a recent study (Mitra *et al.*, 2011) has proposed a way of measuring IT performance and communicating value that has greater meaning to the end user than financial, organisational impact or even service metrics such as service availability metrics currently have. This study identifies that “*measuring and communicating the value provided by the IT function continues to be a challenge for CIOs*” (Mitra *et al.*, 2011, p. 47), and identifies that there are many dimensions to IT performance which can vary in “*their levels of specificity, meaningfulness, and influence*” (Mitra *et al.*, 2011, p. 48). The authors establish that there is a difference between “*IT performance that can be measured and value from IT that can be communicated*” (Mitra *et al.*, 2011, p. 48). For example, there is not much point in declaring a project a success just because it came in on time and on budget if the project adds no value to the organisation.

The key is to identify the most appropriate key performance indicators (KPIs) with the greatest meaning for stakeholders. For example, KPIs appropriate for a utility ITM would not be appropriate for an organisation that had reached the stage of having a facilitator CIO. Therefore a portfolio of metrics is proposed as illustrated in Figure 4 to capture the range and scope of possible ITM engagements in an organisation.

By identifying which KPIs are more appropriate for each IoT and cross referencing these results with the results from the appropriate CIO role and new CIO leadership self-assessment study, a measure of current ITM effectiveness within the IoTI is developed. By cross referencing the results in this fashion, confidence in the measure is increased.

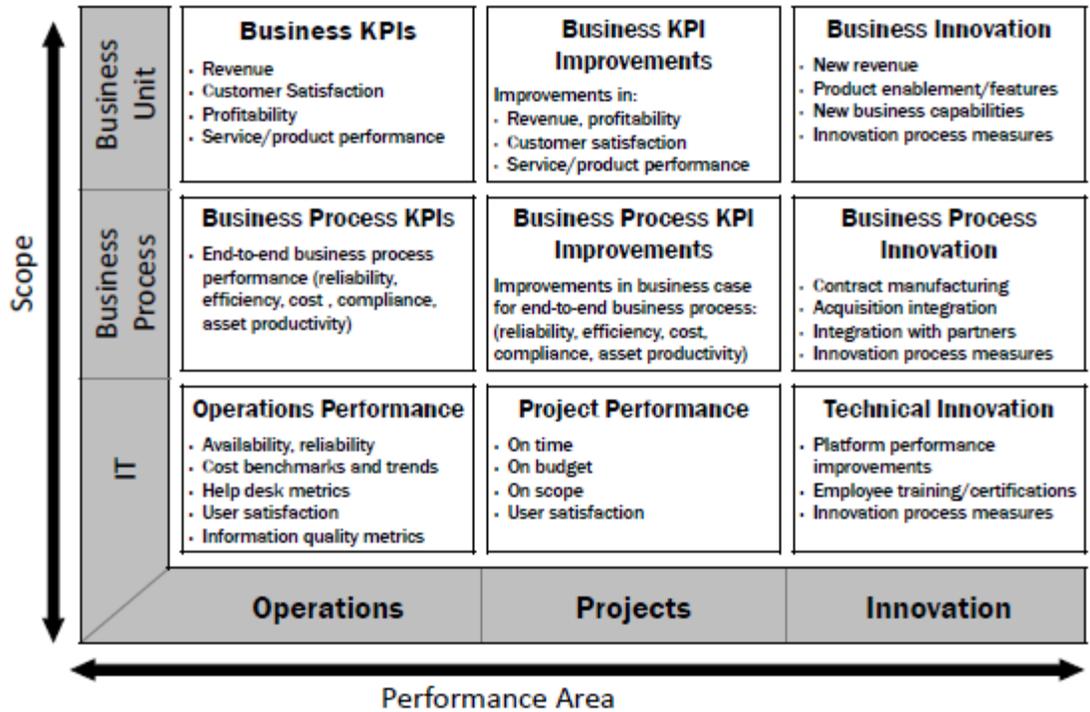


Figure 4: The Portfolio of Metrics (Mitra *et al.*, 2011)

The third research question for this study will be to establish the current KPIs most appropriate to the IoTI sector.

Conceptual Framework Model

By identifying data pertinent to the three research questions, the abstract concept of ITM effectiveness has been operationalised. The conceptual framework for this study is illustrated in Figure 5. The three seminal studies (Broadbent and Kitziis, 2004; Mitra *et al.*, 2011; Peppard *et al.*, 2011) are combined to give a measure of the state of ITM effectiveness in the IoTI sector today. These combine the distinct ITM roles appropriate for the prevailing state of IT development of an organisation with the new ITM leadership styles reported by the ITM, which are then analysed with the results of the appropriate KPIs for the IT Departments in each Institute for which the ITM is responsible.

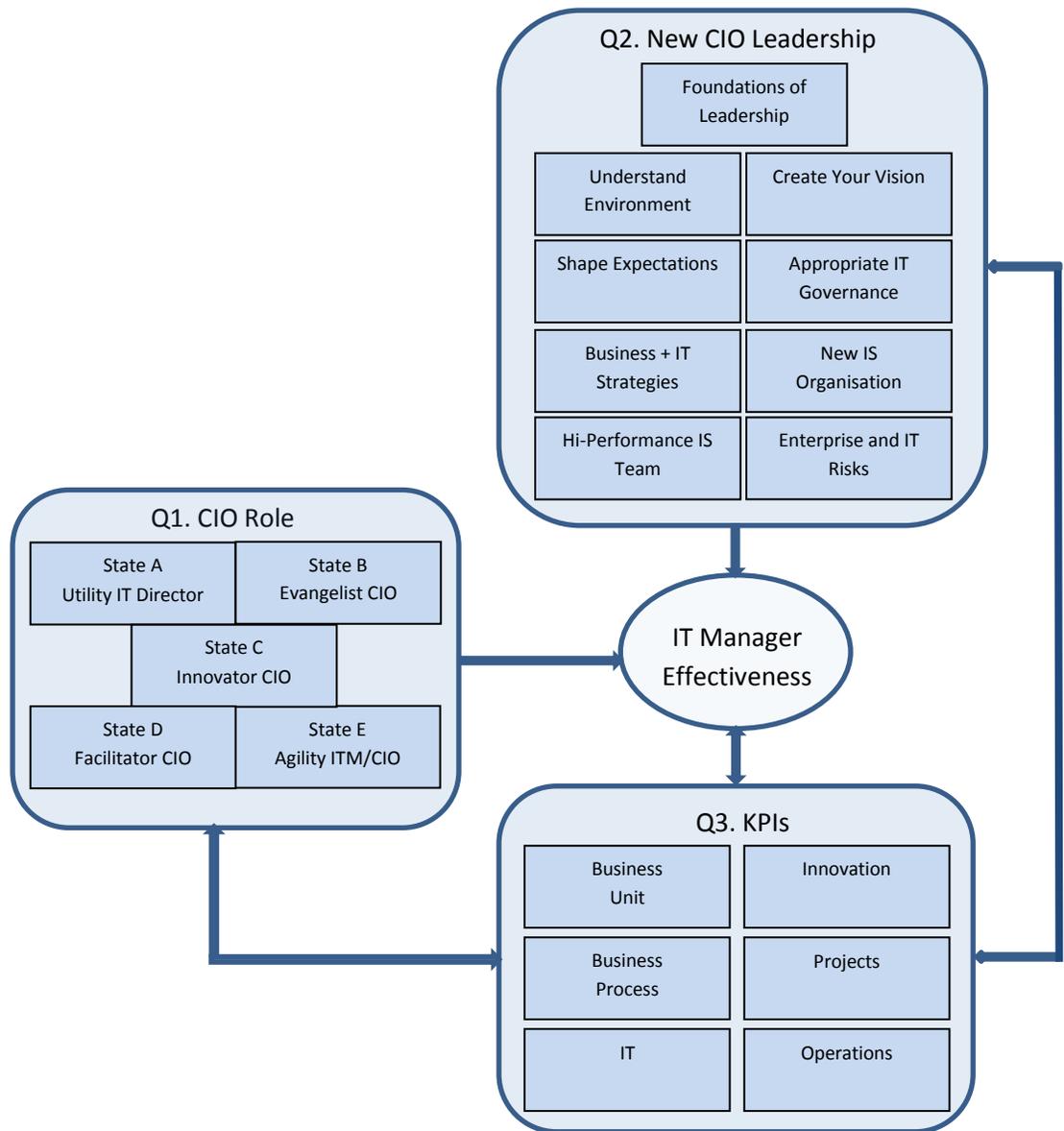


Figure 5: Conceptual Model of IT Manager Effectiveness

Methodology

Research is “something that people undertake in order to find out things in a systematic way, thereby increasing their knowledge” (Saunders *et al.*, 2003, p. 3). As the aim of this study is to measure the effectiveness of the current IT Management structures and roles in the IoTI sector to determine if they remain relevant and effective to meet the challenges of a modern-day higher education institute an empirical study with an interpretivist approach is adopted. By identifying

current thinking and developments into the assessment of ITM effectiveness and tailoring research instruments to target ITMs in the IoTI sector, a measure of effectiveness is developed.

As the researcher himself is a current IT Manager in the IoTI sector it places him in a unique position to interpret the data with an insider's understanding. Furthermore, as a practitioner, it defends against the often made charge of theory not being relevant to practice (Benbasat and Zmud, 1999; Fitzgerald, 2003). However, this close association to the subject matter does leave room for researcher bias. This will be guarded against by using the three chosen contemporary studies on which to base the research instrument therefore providing three different filtered views of the same concept.

Through personal contact by the researcher, all IT Managers in the IoTI sector are known and so all ITMs are asked to complete online questionnaires to provide data for this study. The questionnaire is composed of three sections: the first part assess the most relevant role that each one plays in their home Institute based on the Peppard *et al.*, (2011) study, the second part uses the new CIO leadership self-assessment study described by Broadbent and Kitzis (2004) to determine the style of ITM leadership in the sector and the final part of the questionnaire gathers data on the most appropriate KPIs for the roles that each ITM carries out based on the Mitra *et al.*, (2011) study. The data gathered through the questionnaires are then analysed using the statistical analysis software package; SPSS to establish the effectiveness of the ITMs in the IoTI sector.

Conclusions

The aim of this study is to determine whether or not the current IT Management structures and roles remain relevant and effective to meet the challenges presented by the profound changes which have occurred in both technologies and the environment in which the IT Manager operates today. The ITM roles were established in the IoTI sector in the 1990s before the widespread adoption of the internet, e-mail or mobile phones but the structures today remain largely unchanged. Through the changes in technology and the changes in higher education globally, this study is timely as with proposed mergers and possible changes of focus of Institutes through possible upgrades, the role of the ITM should be examined to maintain relevance for the position within the management team of HE.

The results of this study have implications for the recruitment, retention and continuous professional development for IT Managers in the IoTI sector. The research instrument which is composed of a questionnaire built on three chosen contemporary studies of CIO roles, CIO leadership and KPIs for measuring CIO and IT Department effectiveness provide three complimentary views of the single entity which is IT Manager effectiveness.

References

- Abdoli Sejzi, A., Aris, B. and Yahaya, N. (2011) 'Virtual University And Globalisation', *journal of edupres*, Vol. 1, pp. 35-41.
- Bakhtiari, S. and Shajar, H. (2011) 'Globalization and Education: Challenges and opportunities', *International Business & Economics Research Journal (IBER)*, Vol. 5, No. 2.
- Banker, R. D., Hu, N., Pavlou, P. A. and Luftman, J. (2011) 'CIO reporting structure, strategic positioning, and firm performance', *MIS Quarterly*, Vol. 35, No. 2, pp. 487-504.
- Becker, N. J. (1999) *Implementing technology in higher education: The leadership role and perspectives of the chief information officer*, Thesis, Teachers College, Columbia University.
- Bedeian, A. G. and Wren, D. A. (2001) 'Most influential management books of the 20th century', *Organizational Dynamics*, Vol. 29, No. 3, pp. 221-225.
- Benbasat, I. and Zmud, R. W. (1999) 'Empirical research in information systems: the practice of relevance', *MIS Quarterly*, pp. 3-16.
- Bharadwaj, A. S. (2000) 'A resource-based perspective on information technology capability and firm performance: an empirical investigation', *MIS Quarterly*, pp. 169-196.
- Bharadwaj, A. S., Bharadwaj, S. G. and Konsynski, B. R. (1999) 'Information technology effects on firm performance as measured by Tobin's q', *Management science*, Vol. 45, No. 7, pp. 1008-1024.
- Broadbent, M. and Kitzis, E. (2004) *The new CIO leader: setting the agenda and delivering results*, Harvard Business Press.
- Brown, P. and Lauder, H. (1996) 'Education, globalization and economic development', *Journal of Education Policy*, Vol. 11, No. 1, pp. 1-25.
- Brown, W. A. (2006) 'CIO Effectiveness in Higher Education', *Educause Quarterly*, Vol. 29, No. 1, pp. 6.
- Brunsson, K. H. (2008) 'Some effects of Fayolism', *International Studies of Management and Organization*, Vol. 38, No. 1, pp. 30-47.
- Brynjolfsson, E. and Hitt, L. M. (2000) 'Beyond computation: Information technology, organizational transformation and business performance', *The Journal of Economic Perspectives*, pp. 23-48.
- Carlson, S. (1951) *Executive behaviour: a study of the work load and the working methods of managing directors*, Arno Press.
- Carroll, S. J. and Gillen, D. J. (1987) 'Are the classical management functions useful in describing managerial work?', *Academy of Management Review*, pp. 38-51.
- Carter, M., Grover, V. and Thatcher, J. B. (2011) 'The emerging CIO role of business technology strategist', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 19-29.
- Cartwright, G. (2002) 'Today's CIO: Leader, Manager, and Member of the "Executive Orchestra"', *Educause Review*, Vol. 37, pp. 6-7.

- Chen, D. Q., Mocker, M., Preston, D. S. and Teubner, A. (2010) 'Information systems strategy: reconceptualization, measurement, and implications', *MIS Quarterly*, Vol. 34, No. 2, pp. 233-259.
- Chen, Y. and Zhu, J. (2004) 'Measuring Information Technology's Indirect Impact on Firm Performance', *Information Technology and Management*, Vol. 5, No. 1, pp. 9-22.
- Cheng, Y. C. (2004) 'Fostering local knowledge and human development in globalization of education', *International Journal of Educational Management*, Vol. 18, No. 1, pp. 7-24.
- Chester, T. M. (2006) 'A roadmap for IT leadership and the next ten years', *Educause Quarterly*, Vol. 29, No. 2, pp. 56.
- Chun, M. and Mooney, J. (2009) 'CIO roles and responsibilities: Twenty-five years of evolution and change', *Information & Management*, Vol. 46, No. 6, pp. 323-334.
- Deem, R. (1998) 'New managerialism and higher education: The management of performances and cultures in universities in the United Kingdom', *International Studies in Sociology of Education*, Vol. 8, No. 1, pp. 47-70.
- Devaraj, S. and Kohli, R. (2003) 'Performance impacts of information technology: Is actual usage the missing link?', *Management science*, pp. 273-289.
- Enns, H. (2000) 'Chief information officers' influence behaviors, outcomes, and technical background roles', *The University of Western Ontario (Canada), Canada*.
- Enns, H. and Huff, S. (2000) *Chief Information Officer Influence: An Exploratory Study*. Citeseer.
- Enns, H. G., Huff, S. L. and Higgins, C. A. (2003) 'CIO lateral influence behaviors: Gaining peers' commitment to strategic information systems', *MIS Quarterly*, Vol. 27, No. 1, pp. 155-176.
- Enns, H. G., McFarlin, D. B. and Huff, S. L. (2007) 'How CIOs can effectively use influence behaviors', *MIS Quarterly Executive*, Vol. 6, No. 1, pp. 29-38.
- Fayol, H. (1916) 'General and Industrial Management', in New York: IEEE Press, pp.
- Feeny, D. F. and Willcocks, L. P. (1998) 'Core IS capabilities for exploiting information technology', *Sloan Management Review*, Vol. 39, No. 3, pp. 9-21.
- Fitzgerald, B. (2003) 'Informing each other: Bridging the gap between researcher and practitioners', *Informing Science*, Vol. 6, pp. 13-19.
- Galloway, I. (2010) *Exploration into the impact of CEO and CIO shared knowledge on firm performance*, Thesis, Concordia University.
- Gammelgard, M., Lindstrom, A. and Simonsson, M. (2006) *A reference model for IT management responsibilities*. IEEE.
- Gartner (2012) 'Gartner Says Customer Experience Enters Top 10 Cio Technology Priorities for 2012', *Press Release*.
- Gottschalk, P. (2000a) 'The Chief Information Officer: A Study of Managerial Roles', *International Journal of Technology, Policy and Management*, Vol. 2, No. 2/2002000, pp. 93-101.

- Gottschalk, P. (2000b) 'Information systems executives: the changing role of new IS/IT leaders', *Informing Science*, Vol. 3, No. 2, pp. 31-40.
- Gottschalk, P. (2000c) *IS/IT leadership roles*. IEEE.
- Gottschalk, P. and Taylor, N. J. (2000) *Strategic management of IS/IT functions: the role of the CIO*. IEEE.
- Grover, V., Jeong, S. R., Kettinger, W. J. and Lee, C. C. (1993) 'The chief information officer: A study of managerial roles', *Journal of Management Information Systems*, Vol. 10, No. 2, pp. 107-130.
- Hales, C. P. (1986) 'What do managers do? A critical review of the evidence', *Journal of Management Studies*, Vol. 23, No. 1, pp. 88-115.
- Hancock, P. and Tyler, M. (2004) 'MOT your life': Critical management studies and the management of everyday life', *Human Relations*, Vol. 57, No. 5, pp. 619-645.
- Hanna, N. K. (2007) 'e-Leadership institutions for the knowledge economy', *World Bank Institute Working Paper*. Washington, DC: World Bank.
- HETAC (2006) 'External Review of HETAC' [Online]. Available at: <http://www.hetac.ie/docs/Appendix%205.pdf> (Accessed 17th June 2012).
- Hunter, G. (2010) 'The Chief Information Officer: A Review of the Role', *Journal of Information, Information Technology, and Organizations*, Vol. 52010, pp. 18.
- Iyengar, K. P. (2008) 'The effect of leadership style on CIO effectiveness'.
- Jackson, G. (2004) 'A CIO's Question: Will You Still Need Me When I'm 64?', *Chronicle of Higher Education*, Vol. 50, No. 21, pp. B22.
- Jonas, D. (2010) 'Empowering project portfolio managers: How management involvement impacts project portfolio management performance', *International Journal of Project Management*, Vol. 28, No. 8, pp. 818-831.
- Karahanna, E. and Watson, R. T. (2006) 'Information systems leadership', *Engineering Management, IEEE Transactions on*, Vol. 53, No. 2, pp. 171-176.
- Katz, R. N. (2004) *Information technology leadership in higher education: The condition of the community*, EDUCAUSE Center for Applied Research.
- Kelley, T. D. and Sharif, N. M. (2005) 'Understanding the mindset of higher education CIOs', *Educause Quarterly*, Vol. 28, No. 4, pp. 33.
- Ko, D. and Fink, D. (2010) 'Information technology governance: an evaluation of the theory-practice gap', *Corporate Governance*, Vol. 10, No. 5, pp. 662-674.
- Kurien, P. and Purushottam, V. (2004) 'The case for re-examining IT effectiveness', *Journal of Business Strategy*, Vol. 25, No. 2, pp. 29-36.
- Kurke, L. B. and Aldrich, H. E. (1983) 'Mintzberg was right!: A replication and extension of the nature of managerial work', *Management science*, pp. 975-984.

- Lamond, D. (2003) 'Henry Mintzberg vs Henri Fayol: Of Lighthouses, Cubists and the Emperor's New Clothes', *Journal of Applied Management and Entrepreneurship*, Vol. 8, No. 4, pp. 5-28.
- Lamond, D. (2004) 'A matter of style: reconciling Henri and Henry', *Management Decision*, Vol. 42, No. 2, pp. 330-356.
- Lance, D. D. (2006) *Examining the CEO/CIO disconnect using Luftman's strategic alignment maturity assessment model five years later*, Thesis, CAPELLA UNIVERSITY.
- Lau, A. W. and Pavett, C. M. (1980) 'The Nature of Managerial Work: A Comparison of Public-and Private-Sector Managers', *Group & Organization Studies*, Vol. 5, No. 4, pp. 453 - 466.
- Lineman, J. P. (2006) *The chief information officer in higher education: A study in managerial roles*, Thesis, CAPELLA UNIVERSITY.
- Mahoney, T. A., Jerdee, T. H. and Carroll, S. J. (1965) 'The job (s) of management', *Industrial Relations: A Journal of Economy and Society*, Vol. 4, No. 2, pp. 97-110.
- Marginson, S. (2010) 'Higher education in the global knowledge economy', *Procedia-Social and Behavioral Sciences*, Vol. 2, No. 5, pp. 6962-6980.
- Marginson, S. and Wende, M. (2007) 'Globalisation and higher education'.
- Marks, A. and Rezgui, Y. (2008) 'IT Leadership in Higher Education: The CIO Candidate', *Management science*, Vol. 54, No. 3, pp. 415-428.
- Marks, A. and Rezgui, Y. (2011) 'IT Leadership in Higher Education: The CIO Candidate', *IT Professional Magazine*, Vol. 13, No. 3, pp. 52-56.
- McCall, M. W. and Segrist, C. A. (1980) *In Pursuit of the Manager's Job: Building on Mintzberg*, Center for Creative Leadership.
- McLean, E. R. and Smits, S. J. (2012) 'Management, Leadership, and the Roles of the CIO'.
- Melville, N., Kraemer, K. and Gurbaxani, V. (2004) 'Review: Information technology and organizational performance: An integrative model of IT business value', *MIS Quarterly*, Vol. 28, No. 2, pp. 283-322.
- Menz, M. (2012) 'Functional Top Management Team Members A Review, Synthesis, and Research Agenda', *Journal of Management*, Vol. 38, No. 1, pp. 45-80.
- Meyer, H. D. (2002) 'The new managerialism in education management: corporatization or organizational learning?', *Journal of Educational Administration*, Vol. 40, No. 6, pp. 534-551.
- Mintzberg, H. (1973) *The nature of managerial work*, New York: Harper & Row.
- Mithas, S. and Krishnan, M. (2009) 'From association to causation via a potential outcomes approach', *Information systems research*, Vol. 20, No. 2, pp. 295-313.
- Mitra, S., Sambamurthy, V. and Westerman, G. (2011) 'Measuring IT Performance and Communicating Value', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 47-59.

- Napier, N. P., Keil, M. and Tan, F. B. (2007) 'IT project managers' construction of successful project management practice: a repertory grid investigation', *Information Systems Journal*, Vol. 19, No. 3, pp. 255-282.
- Nelson, M. (2003) 'The CIO in higher education: Leadership, competencies, effectiveness', *ECAR Research Bulletin*.
- Nicolet, T. (2011) 'Leadership in higher education: the CIO role and the leadership team'.
- Noordegraaf, M. and Stewart, R. (2000) 'Managerial behaviour research in private and public sectors: distinctiveness, disputes and directions', *Journal of Management Studies*, Vol. 37, No. 3, pp. 427-443.
- Paolillo, J. G. P. (1987) 'Role profiles for managers in different functional areas', *Group & Organization Management*, Vol. 12, No. 1, pp. 109-118.
- Pavett, C. M. and Lau, A. W. (1983) 'Managerial work: The influence of hierarchical level and functional specialty', *The academy of management journal*, Vol. 26, No. 1, pp. 170-177.
- Penrod, J. I. (2003) 'Creating a realistic IT vision: The roles and responsibilities of a chief information officer', *The Technology Source*.
- Penrod, J. I. (2005) 'Reflections on a Career as a Four-Time CIO', *Research Bulletin*.
- Penrod, J. I., Dolence, M. G. and Douglas, J. V. (1990) *The chief information officer in higher education*, CAUSE.
- Peppard, J. (2010a) 'The Hi-Impact Chief Information Officer (CIO): Reframing the CxO Dialogue'.
- Peppard, J. (2010b) 'Unlocking the performance of the chief information officer (CIO)', *California Management Review*, Vol. 52, No. 4, pp. 73-99.
- Peppard, J., Edwards, C. and Lambert, R. (2011) 'Clarifying the Ambiguous Role of the CIO', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 31-44.
- Pratt, G. and Poole, D. (2000) 'Global corporations "R" us? The impacts of globalisation on Australian universities', *Australian Universities' Review*, Vol. 43, No. 1.
- Preston, D. S., Chen, D. and Leidner, D. E. (2008a) 'Examining the Antecedents and Consequences of CIO Strategic Decision Making Authority: An Empirical Study*', *Decision Sciences*, Vol. 39, No. 4, pp. 605-642.
- Preston, D. S. and Karahanna, E. (2009) 'Antecedents of IS strategic alignment: a nomological network', *Information systems research*, Vol. 20, No. 2, pp. 159-179.
- Preston, D. S., Leidner, D. E. and Chen, D. (2008b) 'CIO leadership profiles: implications of matching CIO authority and leadership capability on IT impact', *MIS Quarterly Executive*, Vol. 7, No. 2, pp. 57-69.
- Rau, K. G. (2004) 'Effective governance of IT: Design objectives, roles, and relationships', *Information Systems Management*, Vol. 21, No. 4, pp. 35-42.

- Rockart, J. F. (1982) 'The changing role of the information systems executive: a critical success factors perspective', *Sloan Management Review*, Vol. 24, No. 1, pp. 3-13.
- Rockart, J. F., Ball, L. and Bullen, C. V. (1982) 'Future role of the information systems executive', *MIS Quarterly*, pp. 1-14.
- Roets, R. and Sewry, D. (2006) *ICT: Irrelevant to Transformation in Higher Educational Institutions*. Pretoria, South Africa,
- Ross, J. W. and Feeny, D. F. (1999) 'The evolving role of the CIO', *Oxford Institute of Information Management-Research and Discussion Paper*.
- Saunders, M., Lewis, P. and Thornhill, A. (2003) *Research methods for business students*, 3rd Edn. Prentice Hall, London.
- Sayles, L. R. (1999) 'Managerial Behavior and a journey through time', *The Leadership Quarterly*, Vol. 10, No. 1, pp. 7-11.
- Scott, J. E. (2007) 'Mobility, business process management, software sourcing, and maturity model trends: propositions for the IS organization of the future', *Information Systems Management*, Vol. 24, No. 2, pp. 139-145.
- Seddon, P. B., Walker, D., Reynolds, P. and Willcocks, L. (2008) 'A Case-Based Assessment of the Descriptiveness of Three CIO Typologies and Validity of Two CIO-Effectiveness Models'.
- Smaltz, D. H., Sambamurthy, V. and Agarwal, R. (2006) 'The antecedents of CIO role effectiveness in organizations: An empirical study in the healthcare sector', *Engineering Management, IEEE Transactions on*, Vol. 53, No. 2, pp. 207-222.
- Stephens, C. S., Ledbetter, W. N., Mitra, A. and Ford, F. N. (1992) 'Executive or functional manager? The nature of the CIO's job', *MIS Quarterly*, pp. 449-467.
- Stewart, R. (1982) 'A Model for Understanding Managerial Jobs and Behavior', *Academy of Management Review*, Vol. 7, No. 1, pp. 7-13.
- Stewart, R. (2007) 'Studies of managerial jobs and behaviour: the ways forward', *Journal of Management Studies*, Vol. 26, No. 1, pp. 1-10.
- Tengblad, S. (2006) 'Is there a 'New Managerial Work'? A Comparison with Henry Mintzberg's Classic Study 30 Years Later*', *Journal of Management Studies*, Vol. 43, No. 7, pp. 1437-1461.
- Todd, P. A., McKeen, J. D. and Gallupe, R. B. (1995) 'The evolution of IS job skills: A content analysis of IS job advertisements from 1970-1990', *Management Information Systems Quarterly*, Vol. 19, pp. 1-1.
- Torkzadeh, G. and Doll, W. J. (1999) 'The development of a tool for measuring the perceived impact of information technology on work', *Omega*, Vol. 27, No. 3, pp. 327-339.
- Vreuls, E. H. and Joia, L. A. (2011) 'An Exploratory Model for the Relevant Factors Related to the Professional Performance of the Brazilian CIO', *The Electronic Journal of Information Systems in Developing Countries*, Vol. 47.

Weill, P. (1992) 'The relationship between investment in information technology and firm performance: A study of the valve manufacturing sector', *Information systems research*, Vol. 3, No. 4, pp. 307-333.

Weill, P. (2004) 'Don't just lead, govern: How top-performing firms govern IT', *MIS Quarterly Executive*, Vol. 3, No. 1, pp. 1-17.

Winter, R., Sarros, J. and Management, M. U. D. o. (2001) *Corporate reforms to Australian universities: Views from the academic heartland*, Department of Management, Monash University.

Winter, R., Taylor, T. and Sarros, J. (2000) 'Trouble at mill: Quality of academic worklife issues within a comprehensive Australian university', *Studies in Higher Education*, Vol. 25, No. 3, pp. 279-294.

Paper 2: Methodology

Abstract

The starting point for any research is an interest in solving a particular problem. A problem might be broadly defined as an unanswered question, a recognition of a gap in knowledge, a belief that something is wrong and needs to be fixed, or something else that could benefit from a structured form of investigation. The broad problem being addressed in this study is a gap in the knowledge of how effective IT Managers are in the Institute of Technology (IoT) sector in Ireland. The purpose of this section is to describe the choices made when deciding on which particular form of structured investigation to use to enquire into this problem. The research follows a qualitative, interpretive paradigm using multiple case studies and theory building from case study approach to data analysis to develop a theory on IT Manager effectiveness in the IoTI sector.

Keywords: Qualitative research, case study, theory building.

Introduction

The topic under investigation in this study is the effectiveness of IT Managers (ITMs) in the Institutes of Technology (IoT) in Ireland. There are thirteen IOTs in Ireland, each of which has an IT Manager employed, and as the researcher himself is one of the thirteen, the study will be conducted on the remaining twelve. The methodology used by the researcher, which is the subject of this chapter, is based on the nature of the study, the conceptual framework of the study and the purpose of the study. The study concentrates on three pillars of IT Manager effectiveness found in the literature: CIO Role (Peppard *et al.*, 2011), New CIO Leadership (Broadbent and Kitzis, 2004) and appropriate KPIs applied to an IT Manager to measure performance and ability to communicate IT value (Mitra *et al.*, 2011) which the researcher combines into an aggregate measure of IT Manager effectiveness.

The principal goal of the study is to assess the effectiveness of the contribution that IT Managers in the sector make to the running of the Institutes, and to formulate a theory on it so that if room for improvement is found, there will be a framework by which to measure how to improve effectiveness. The results of this study have implications for the recruitment, retention and the continuous professional development of IT Managers in the IoTI sector.

The expected completion rate of this survey is 100%. This may seem ambitious to sample 100% of the population but when it is considered that all IT Managers in the sector are known personally to the researcher who has approached everyone in the group of managers already and has received the unanimous backing of the group to continue with the study, this optimism might be more understandable. The only danger, foreseeable at this point, of not achieving 100% completion rate is the risk of current IT Managers either leaving the sector to take up a post elsewhere or being seconded to another post within the sector. However, if someone leaves their post as an IT Manager in the sector at or very near the time of the survey, that person will be contacted to complete the survey anyway as it would take some months for a replacement IT Manager to be in post before having a sufficiently in depth knowledge of both the post and the sector to be able to provide useful data for the survey.

This section outlines the research objective, the research strategy and discusses the paradigm questions to be considered. It also explains the choice of field study comprising multiple case studies as the methodology and justifies these methods with reference to some of the more common paradigms in use today. Discussions of ontological and epistemological stance are adjourned until the next paper on philosophy. Finally a research protocol is developed to guide the research to completion.

Research Objective

The principal goal of the study is to assess the effectiveness of the contribution that IT Managers in the sector make to the running of Institutes, and by doing so to suggest a theory which captures the

contributing factors to ITM effectiveness. The broad problem being addressed by this study is that currently there are no measures of effectiveness of ITMs in the sector. The IoTI sector, like all higher education globally, is witnessing changes which are placing greater demands on information and communication technologies (ICT) and by extension on the IT Managers who have to support the expanding portfolio of applications and services to meet demands such as broadband Internet provision to off campus locations, mobile phones and 24/7 type operations (Marginson and Wende, 2007).

As one of the IT Managers in the sector himself, the researcher is keenly interested in the problems associated with lack of understanding of effectiveness of ITMs in the various Institutes – how do you know that you are doing a good/bad job or even that you are doing what is expected of you and how do you measure this? How do you know what areas to change or improve? At a time when more strategic decision making is expected from ITMs and the provision of ICT services is seen as less of a core competency for ITMs than before (Enns *et al.*, 2003; D.S. Preston *et al.*, 2008b; Chun and Mooney, 2009; Marks and Rezgui, 2011; Maditinos *et al.*, 2012; McLean and Smits, 2012), an accurate measure of current IT Manager effectiveness is necessary to address current and future challenges in the sector. Thus, by identifying the problem and having the interest in finding the answers to just what makes an ITM effective in this sector, this study will provide answers to how to measure ITM effectiveness and improve it by developing a theory of IT Manager effectiveness.

Research Strategy

The literature abounds with references to the contrasts between two apparently opposing research methods: quantitative methods championed by positivists and qualitative methods championed by interpretivists (Miles and Huberman, 1984; Gomm *et al.*, 2000; Bryman, 2004; Richards, 2005; Stake, 2005; Denzin and Lincoln, 2008; Easterby-Smith *et al.*, 2008; Gibson and Brown, 2009). However the literature also confirms that the two different methods of research can co-exist in the one study under such varied names as: mixed methods, multi-strategy and multi-methods (Brannen and Coram, 1992; Brannen, 2005; Onwuegbuzie and Leech, 2005; Punch, 2005; Bryman, 2006; Creswell, 2008). Table 2 outlines the fundamental differences between quantitative and qualitative research strategies and indicates in which situations each is more likely to be encountered. The same literature explains how quantitative analysis depends largely on numeric data as an input and that more abstract subject matter is best captured using words as an input to qualitative data analysis.

As the principal goal of this study does not involve theory testing but theory building through assessing the current state of ITM effectiveness in the IoTI sector and, where possible, suggesting areas for improvement, it could be presumed from reading Table 2 that the study will be a purely qualitative one. However the conceptual framework, shown in Figure 6 underpinning this research relies on three seminal works: CIO Role (Peppard *et al.*, 2011), New CIO Leadership (Broadbent and

Kitzis, 2004), and appropriate KPIs applied to an IT Manager to measure performance and ability to communicate IT value (Mitra *et al.*, 2011). It was found by Peppard *et al.*, (2011) that the role that an IT Manger plays in any organisation was greatly influenced by what the senior management in that organisation wanted and expected from the IT Manager. This was in itself influenced by the degree of IT Maturity amongst the senior management team. Thus the various characteristics of the roles that an ITM can play in an organisation are used to identify which role the ITM is playing in the Institutes to form the basis for the first set of questions (Q1) in Figure 6.

Table 2: Differences Between Quantitative and Qualitative Research Strategies

	Quantitative	Qualitative
Principal orientation to the role of theory in relation to research	Deductive; testing of theory	Inductive; generation of theory
Epistemological orientation	Natural science model, in particular positivism	Interpretivism
Ontological orientation	Objectivism	Constructionism

Fundamental differences between quantitative and qualitative research strategies (Bryman, 2004, p. 20)

Broadbent and Kitzis (2004) placed the emphasis for IT Manager effectiveness on the leadership skills of the IT Manager from which the second set of questions (Q2) in the diagram are derived, and Mitra *et al.*, (2011) proposed a way of measuring IT performance using relevant key performance indicators (KPIs) and communicating value that has greater meaning to the end user than previous methods of demonstrating value such as financial, organisational impact or even service availability metrics currently have. This set of measures makes up the third set of questions (Q3). The Broadbent and Kitzis work on CIO leadership is personal to the individual IT Manager, in particular the leadership traits and abilities of the person and to help the reader of this work assess their own leadership abilities there is an online survey which the reader is encouraged to undertake prior to reading the book and then complete again after reading the book to compare scores for signs of improvement in leadership ability having read the work. As the assessment tool has already been developed and tested by the authors, and as it provides a reference to peer ITMs, the first step in surveying the group will be to ask each current IT Manager in the IoTI sector to take the survey and to report their results. This will provide quantitative data in the form of a score for each of the factors that contribute to effective CIO leadership, which may be further analysed if other data suggest that there is value in further analysis. The main advantage of this online test as the first step in this survey is to familiarise respondents with the type of topics to be enquired into at later stages.

It also provides quantitative data and a means of triangulation as some of the enquiry into CIO role also deals with leadership but from a slightly different angle.

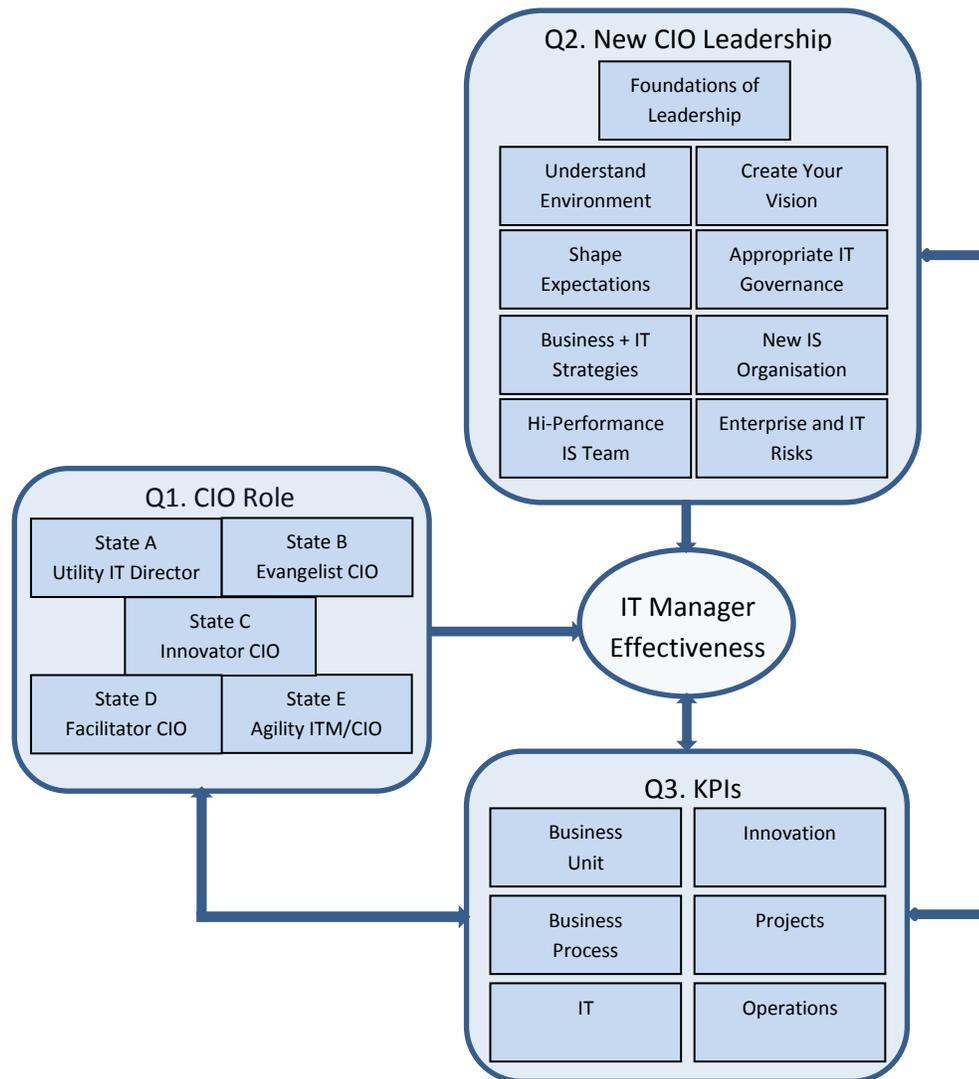


Figure 6: Conceptual Model of IT Manager Effectiveness

The CIO leadership scores are only the beginning of the data collection process; at the very least, there are two other pillars of this study that must be enquired into. The data required to assess the three pillars of this study necessitate enquiring into IT Managers (Actors) and their effectiveness (Behaviour) as measured using; CIO Role, leadership and KPIs in each manager’s own Institute of Technology (Context). The evidence gathered to measure each of these facets of a group of IT Managers resonates with the findings of Joseph E. McGrath who in 1984 published his work “*Groups: Interaction and performance*” (McGrath, 1984) and described the three competing research priorities thus:

1. The *generalizability* of the evidence over *populations* of actors (A)
2. The precision of measurement of the *behaviors* (and precision of control of extraneous facets or variables that are not being studied) (B)
3. The *realism* of the situation or *context* (in relation to the contexts to which you want your evidence to refer) (C)

McGrath's (1984) depiction of what he calls "*this strategic dilemma*" is illustrated in

Figure 7 and ably demonstrates that by taking, for example, a purely positivist approach and opting for laboratory experiments where the researcher has total control over all variables thus maximising precision, that the researcher will "*necessarily intrude upon the situation and reduce its "naturalness," or realism*" (McGrath, 1984, p. 32) (C). By doing this the researcher will also "*reduce the generality of the populations to which your results can be applied*" (A) (McGrath, 1984, p. 32). This is an important guide as to how to proceed with the rest of this study as it assists in eliminating inappropriate strategies.

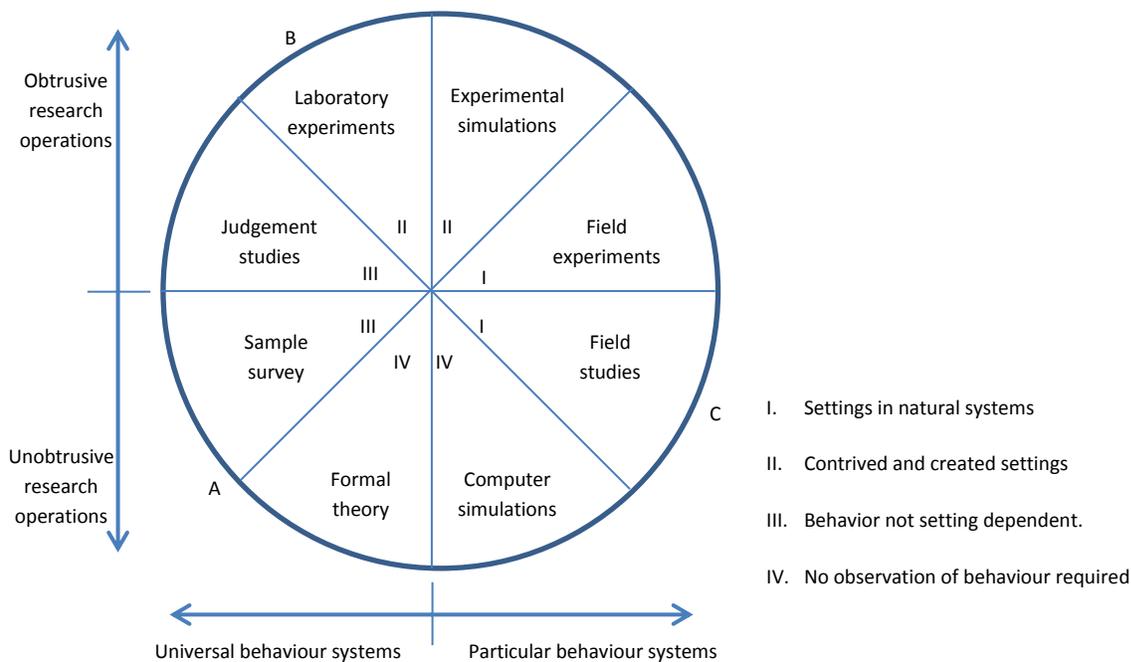


Figure 7: Research Strategies (McGrath, 1984)

Numerous studies of managers and the effectiveness of managers over the years have all concentrated on observing managers or researching what managers do in their natural environment (their workplaces) without interference (Mintzberg, 1971; 1973; Lau *et al.*, 1980; McCall and Segrist, 1980; Kurke and Aldrich, 1983; Luthans, 1988; Stephens *et al.*, 1992; Gottschalk, 2000a; Smaltz *et al.*, 2006; Tengblad, 2006; Stewart, 2007). In attempting to describe the roles/functions of a manager studies invariably turn to researching individual managers or groups of managers in their workplaces. "*Perhaps this is largely because in the true [laboratory] experiment the relevant*

behaviour of interest is not observed in its natural everyday setting” (Gill and Johnson, 2002, p. 50). It is no different with this study where the effectiveness of IT Managers is the topic for investigation. Therefore, with reference to the available strategies in

Figure 7, the researcher immediately rules out anything towards the B section of the pie on the grounds that the precision and ability to replicate the study with 100% accuracy is not required. Also, as 100% of the population will be surveyed, strategies towards the A section of the pie can be dismissed too. This leaves strategies in the C section of the pie to be considered with field studies being the most appropriate as computer simulations for IT Manager effectiveness are not available and field experiments in IT Manager effectiveness in the IoTI sector are beyond the scope of this study. Thus the research strategy for this study will be based on investigating IT Managers in the IoTI sector in the context of their own individual Institutes – a field study.

Paradigm Questions

One of the basic questions of any study is whether or not some theory is to be tested in a scientific way for accuracy or whether the researcher is enquiring into a phenomenon to establish the current status. This will place the study into either a positivist/theory testing paradigm or a constructivist/interpretivist one (Stake, 1978; Yin, 1981; Guba and Lincoln, 1989; Lee, 1991; Miles and Huberman, 1994; Gomm *et al.*, 2000; Greene, 2006; Easterby-Smith *et al.*, 2008). So, from the beginning it is *“important to distinguish between enquiries that are intended to add knowledge or understanding in some significant way and those intended to assess some state of affairs”* (Guba and Lincoln, 1989, p. 163). This study is founded on a review of the literature, which suggested that there are three important components of IT Manager effectiveness: CIO role, CIO leadership and appropriate KPIs. The various IT Managers employed in the IoTI sector are placed at the heart of the study, i.e. the ITM is the unit of analysis, and it is their emic views which are important in this assessment. From this scenario, a constructivist paradigm is to be followed to establish the current status of ITM effectiveness, as opposed to a positivist one where some theory of IT Manager effectiveness is to be tested out. What follows for the rest of this section is a critique of this paradigm from the point of view that with paradigms they *“are not open to proof in any conventional sense; there is no way to elevate one over another on the basis of ultimate, foundational criteria”* (Gomm *et al.*, 2000, p. 109).

A case study methodology is to be used, which *“is clearly useful when a natural setting or a focus on contemporary events is needed”* (Benbasat *et al.*, 1987, p. 372). In this case, it is of no interest whether or not individual ITMs are in any way effective at anything that they might do outside the IoTI sector, nor is there an interest on previous effectiveness in the sector, it is a measure of the current effectiveness that is the focus. During the development of the conceptual framework if there had been any previous assessment of IT Manager effectiveness this would have been of interest, and perhaps this study might then have been one of measurement of current effectiveness against

previous measures, but no evidence of any previous assessment of IT Manager effectiveness in the sector was uncovered, and as the researcher himself is an IT Manager in the sector and has been one since 1998, it is unlikely that such a study was ever completed without his knowledge.

Criticisms of case studies come from the more positivist traditions. *“In particular, it is suggested that they do not have the rigour of natural scientific designs. They rarely allow generalizations to be made from specific cases to the general population; and they produce huge piles of data, which allow researchers to make any interpretation they want”* (Easterby-Smith *et al.*, 2008, p. 97). However it is also held that *“there is broad agreement that generalizability in the sense of producing laws that apply universally is not a useful standard or goal for qualitative research”* (Schofield, 2002, p. 179). In this case, the intention is not to make generalisations about all IT Managers employed in any organisation anywhere in the world; rather, it is to enquire very specifically into ITMs in the IoTI sector. As all ITMs in the sector are to be interviewed for the study, there is no intention, nor is there any room to generalise within the sector either. Once a benchmark has been established for this group, this study might then be used as a starting point for comparison with other sectors in the future. Also, as the survey instrument is based on extant literature, there is a tight conceptual framework guiding the researcher to avoid wild interpretations of completely unstructured data. An interview guide is followed (Appendix A) which shadows the conceptual framework but does not stick to it so slavishly as to prevent the interviewer from interpreting respondents’ replies to questions, a failing often levelled at a more positivist approach, but allows for investigation of new themes if they emerge throughout the data processing phase of the study. The objective is to learn from the data which could require a shift in emphasis in questions as significant ideas emerge (Richards, 2005). In place of discussing concepts of generalisability, it is therefore more appropriate to discuss the fitness of purpose or trustworthiness of the chosen paradigm (Guba and Lincoln, 1982).

“Seen in traditional terms, the reliability and validity of qualitatively derived findings can be seriously in doubt” (Miles and Huberman, 1994, p. 2). Positivist paradigms with a dependence on quantitative data emphasise the importance of internal and external validity (Easterby-Smith *et al.*, 2008). Thus research paradigms such as the one being followed in this study which rely on case studies and interpretivist paradigms are open to question in terms of reliability and validity. This concern is shared amongst the qualitative research community; *“The first concern of most qualitative researchers is with the factual accuracy of their account – that is, that they are not making up or distorting the things they saw and heard”* (Maxwell, 1992, p. 285). However, the self-correcting nature of adhering to an iterative process rather than to a linear one so that the *“researcher moves back and forth between design and implementation to ensure congruence among question formulation, literature, recruitment, data collection strategies, and analysis”* (Morse *et al.*, 2008, p. 17) can go a long way to addressing concerns of validity. During this study, access to respondents is not a barrier so the researcher is not restricted in any way to returning to

source for clarification or further enquiry into any point raised in any interview which may take on a greater importance in light of subsequent interviews. Also by grounding the study in one particular community; the IoTI sector, the risk of misinterpretation across different communities is removed. To increase the internal consistency of the data, the interview guide is structured in such a way as to rely on multiple questions to enquire into the same concept.

Rather than wait until the first interview has been carried out with a current IT Manager to discover that there is a fundamental problem with the questions being asked in the interview, the face validity of the survey, i.e. does it look like it is going to measure what it is designed to measure, will be assessed first by showing the questions to people who were once employed in the sector as IT Managers but have moved on to other positions either within education or beyond (Hardesty and Bearden, 2004). In this manner, the researcher can help to identify and correct “*errors before they are built into the developing model and before they subvert the analysis*” (Morse *et al.*, 2008, p. 17).

Methods

The first step in the process was a review of the literature which suggested that there are three different strands or pillars to the study as shown in Figure 6. Next, the research strategy had to be decided upon and the literature strongly points in favour of a field study as described earlier. As it is a study of IT Managers in each Institute of Technology in Ireland it is an investigation of multiple sites. Also as a conceptual framework has been developed for the study, there is a definite research pattern in mind, so this points to individual case studies at each of the Institutes with an interview guide developed in advance of carrying out the study. Support for this is to be found in the literature; “*The case study is restricted to a single setting; when multiple settings are investigated to help extend the generalizability of the results, we call this a multiple case study or, if many cases are involved and are selected with some definite research pattern in mind, a field study*” (Meredith, 1998, p. 443).

To confirm that case studies, which would collect qualitative data by way of structured interview from each of the IT Managers in each Institute, was the most appropriate research method for this study, the literature in this area is referred to again. An often cited definition of case study comes from Yin; “*As a research strategy, the distinguishing characteristic of the case study is that it attempts to examine: (a) a contemporary phenomenon in its real-life context, especially when (b) the boundaries between phenomenon and context are not clearly evident*” (Yin, 1981, p. 59). In this study, the contemporary phenomenon to be studied is IT Manager effectiveness and studied using existing IT Managers, also the influences on effectiveness and the environment in which the IT Managers work, i.e. the Institutes of Technology are not clearly evident at this stage. The focus here is on getting the IT Managers to describe their individual environments under the three pillar headings of: 1) IT Manager roles, 2) IT Manager leadership 3) appropriate key performance

indicators (KPIs) and to get their interpretations of influences that these three concepts have on their ability to be effective, or to put it another way; case study is being used “*to obtain the descriptions and interpretations of others*” (Stake, 1995, p. 64).

This research is about forming theory from case study and as there is little known about IT Manager effectiveness in the IoTI sector, this type of “*research is particularly appropriate because theory building from case studies does not rely on previous literature or prior empirical evidence*” (Eisenhardt, 1989, p. 548). This is not to say that there should be no previous literature in existence, quite the opposite, as “*investigators should formulate a research problem and possibly specify some potentially important variables, with some reference to extant literature*” (Eisenhardt, 1989, p. 536). The conceptual framework shown previously in Figure 6 was built in such a fashion by using extant literature and the variables identified are those used in the three pillar studies on which this research is based.

Theory building from case study is not without its critics. One of the criticisms of this approach comes from Dyer and Wilkins (1991) who question the possibility of sacrificing an understanding of deeper social dynamics by focusing too much on “surface data” (p. 165). As a result, Dyer and Wilkins (1991) question the ability of the researcher building theory from case study “*to understand and describe the context of the social dynamics of the scene in question to such a degree as to make the context intelligible to the reader and to generate theory in relationship to that context*” (p. 616). The experience of the researcher in this study in the same context as all the respondents to the survey should act as a safeguard against this happening.

To help to maintain the focus of the study “*It is recommended to focus broadly on one identifiable group*” (Hogan *et al.*, 2009, p. 31). This is one reason to limit the study to IT Managers in the Institute of Technology sector in Ireland and not to stray outside the sector to, for example, the University Sector⁷. Limiting the size of the group to be studied also helps to place boundaries around the study and ensures that it can be completed in the time allocated to it. Another advantage is that the researcher, who himself works in the same sector as those being studied, is well placed to understand issues which may not be “*simple and clean, but intricately wired to political, social, historical, and especially personal contexts. All these meanings are important in studying cases*” (Stake, 1995, p. 17). Access to all IT Managers in this group has already been secured by requesting cooperation from the group at a scheduled IT Managers’ group meeting in 2012. Unanimous agreement to cooperate and encouragement was given by all attendees to the meeting. However with this study, great care must be maintained by the researcher to guard against researcher bias. This will be assisted by bringing interim results back to the group for validation.

⁷ Irish Universities (<http://www.iau.ie/>) are constituted in law differently to Irish Institutes of Technology and hence operate under different conditions.

For the leadership strand of the study, each IT Manager will be requested to carry out the self-analysis study that accompanies the book on which this section is based. The rest of the initial data will be provided by structured interviews. At this point, any concerns about interviews, which by their nature yield qualitative data, not providing enough data are allayed as “*Most commonly the complex records required for qualitative projects come from interviewing – either of individuals or in groups*” (Richards, 2005, p. 37) . Even Fred Kerlinger who was a quantitative research of note and who once famously said “*There’s no such thing as qualitative data. Everything is either 1 or 0*” (qtd. in Miles and Huberman, 1994, p. 40) agreed that interviews “*can be the main instrument of the research*” (Kerlinger, 1986, p. 440). Thus for this study it is decided that there will be a mix of methods: quantitative, for the self-assessment leadership style and qualitative, for the structured interviews to be conducted with each IT Manager in the sector. As the entire population of IT Managers (n = 100%) is to be used, there is no requirement for any statistical analysis which might otherwise be used if sampling a section of the population and using the data to infer cause and effect on a wider population.

As the instrument for the quantitative data is already online the instrument for the structured interview was developed next. The conceptual framework illustrated in Figure 6 earlier is the skeleton on which the structured questions were developed and is very much in keeping with the recommendations found in the literature (Yin, 1981; Eisenhardt, 1989; Miles and Huberman, 1994; Stake, 1995; Denzin and Lincoln, 1998; Gill and Johnson, 2002; Bryman, 2004; Richards, 2005; Easterby-Smith *et al.*, 2008; Hogan *et al.*, 2009). Thus the questions used to guide the interviews are set out in three sections as illustrated in Table 3. Even though the online survey will already have provided quantitative data on IT Manger leadership, the interview will allow each IT Manager to elaborate further in a more free-flowing format.

Although an interview guide will be used, slavish adherence to it is not to be expected as “*Case study fieldwork regularly takes the research in unexpected directions, so too much commitment in advance is problematic*” (Stake, 1995, p. 28). Also, when theory building from case study, the “*process occurs via recursive cycling among the case data, emerging theory, and later, extant literature*” (Eisenhardt and Graebner, 2007, p. 25). Interviews will be recorded, most likely conducted by video conference to save traveling the entire length and breadth of the country, and transcribed for later coding and interpretation. Analysis software NVivo⁸ will be used to assist the process of coding and indexing the information gathered by the interviews. The method of structuring the interview questions around the main topics under investigation should pay dividends during the coding and analysis phase of the study as it is reported that a “*very clear way to relate analysis to one’s research questions is to use the questions themselves as the organizing principle of the analysis*” (Gibson and Brown, 2009, p. 197). At this stage, there should be a lot of

⁸ Widely used software that supports qualitative and mixed methods research.
http://www.qsrinternational.com/products_nvivo.aspx

information available, but it only “*becomes relevant data, evidence for our arguments, when its relationship to a research question is established*” (Richards, 2005, p. 33).

Topic	Sub-topics	
1. IT Manager Role	Utility IT Director Evangelist CIO Innovator CIO	Facilitator CIO Agility ITM/CIO
2. IT Leadership	Foundations of Leadership Understand Environment Shape Expectations Business + IT Strategies Hi-Performance IS Team	Create Your Vision Appropriate IT Governance New IS Organisation Enterprise and IT Risks
3. KPIs	Business Unit Business Process IT	Innovation Projects Operations

The next phase of the process therefore is interpretation and analysis. “*Interpretation is a major part of all research*” (Stake, 1995, p. 9) and is dependent for success on how the information was gathered and coded to form data. The researcher can simply write up a report on all the data but this is likened to a detective at a crime scene simply writing up all that was found at the scene without trying to solve the crime (Yin, 1981). As this study involves multiple Institutes of Technology, or crime scenes to use Yin’s analogy, the task is to identify what is unique about individual cases and what is similar across all Institutes. In terms of a more positivist approach to research it could be said that “*each case serves as a distinct experiment that stands on its own as an analytic unit*” (Eisenhardt and Graebner, 2007, p. 25).

This part of the process can be subjective and might even produce new puzzles “*more frequently than solutions to old ones*” (Stake, 1995, p. 45). The coding process is one “*for which there are no rules, merely guidelines*” (Henn *et al.*, 2005, p. 202). Coding will be across the themes of the questions in the structured interviews on the basis that thematic work is a very common form of qualitative enquiry (Gibson and Brown, 2009). The thematic analysis will search for both commonality and differences in the data and for relationships that may exist between elements in that data. It is expected that this will be a lengthy and highly iterative process as the more interviews that are analysed the more commonality, differences and relationships that are likely to be discovered. The purpose here “*is to compare systematically the emergent frame with the evidence from each case in order to assess how well or poorly it fits with case data*” (Eisenhardt, 1989, p. 541). The process will begin by comparing single cases with the conceptual framework and the literature from which the conceptual framework was developed followed by cross case analysis following in the same vein. This involves identifying concepts in the collected data and asking “*what is this similar to, what does it contradict, and why*” (Eisenhardt, 1989, p. 544).

One of the issues of concern for a researcher at this point is to identify when to stop iterating. According to Eisenhardt (1989, p. 545) “*the iteration process stops when the incremental*

improvement to theory is minimal.” The findings will then be brought back to the ITMs for approval or amendment as the case may be prior to the final report being written up.

Research Protocol

The purpose of developing a research protocol is that it “*allows for a chain of evidence, ensuring increased reliability and reduced misperception at every stage of the research process*” (Kelliher, 2005, p. 123). This protocol maps out the different phases of the research and labels the various activities undertaken from beginning to end. This research is an interpretivist study of IT Managers in the IoTI sector using a case study per Institute to get information on IT Manager effectiveness which is then used as the basis for developing a theory on IT Manager effectiveness in the sector.

The research is broken down into three main phases illustrated in Figure 8

1. Research Design
2. Data Collection
3. Analysis and Theory Building

From the diagram in Figure 8, it is clear that the literature review is the starting point for the study. During this phase, it was determined that there were three main themes emerging: CIO role (Peppard *et al.*, 2011), leadership (Broadbent and Kitzis, 2004) and KPIs (Mitra *et al.*, 2011) which were combined to form three pillars of the study. The literature review developed, through an iterative process, into the conceptual framework, previously illustrated in Figure 6. From this the interview guide, attached in Appendix A, was developed laying out the questions to be covered and laying down ground rules for confidentiality and how to conduct the interviews. The limits of the study were decided at this stage also, i.e. that it was to be a multiple case study of IT Managers in the IoTI sector.

The process of data collection begins by contacting each of the IT Managers working in the IoTI sector and asking them to take the on-line leadership self-assessment test designed by Broadbent and Kitzis (2004) in preparation for the one to one interview to be conducted and recorded by video conference at a later date. The interviews are transcribed soon after each interview so that they are still fresh in the mind and no meaning is lost. Interview diaries in the form of notes are maintained for each interview.

The notes record the times of the interviews but also the overall tone of the interview which may be lost in the process of transcription. Thus, the first stage of interpretation begins. A separate personal reflective diary is maintained to record the thoughts and feelings of the researcher during the interview process to help remove researcher bias from the essence of the interviewee’s thoughts. This is important as “*the effectiveness of case research will, in part, be dependent on the skills of the interviewer*” (Voss *et al.*, 2002, p. 207) and identifying interviewer bias is important to improving these skills.

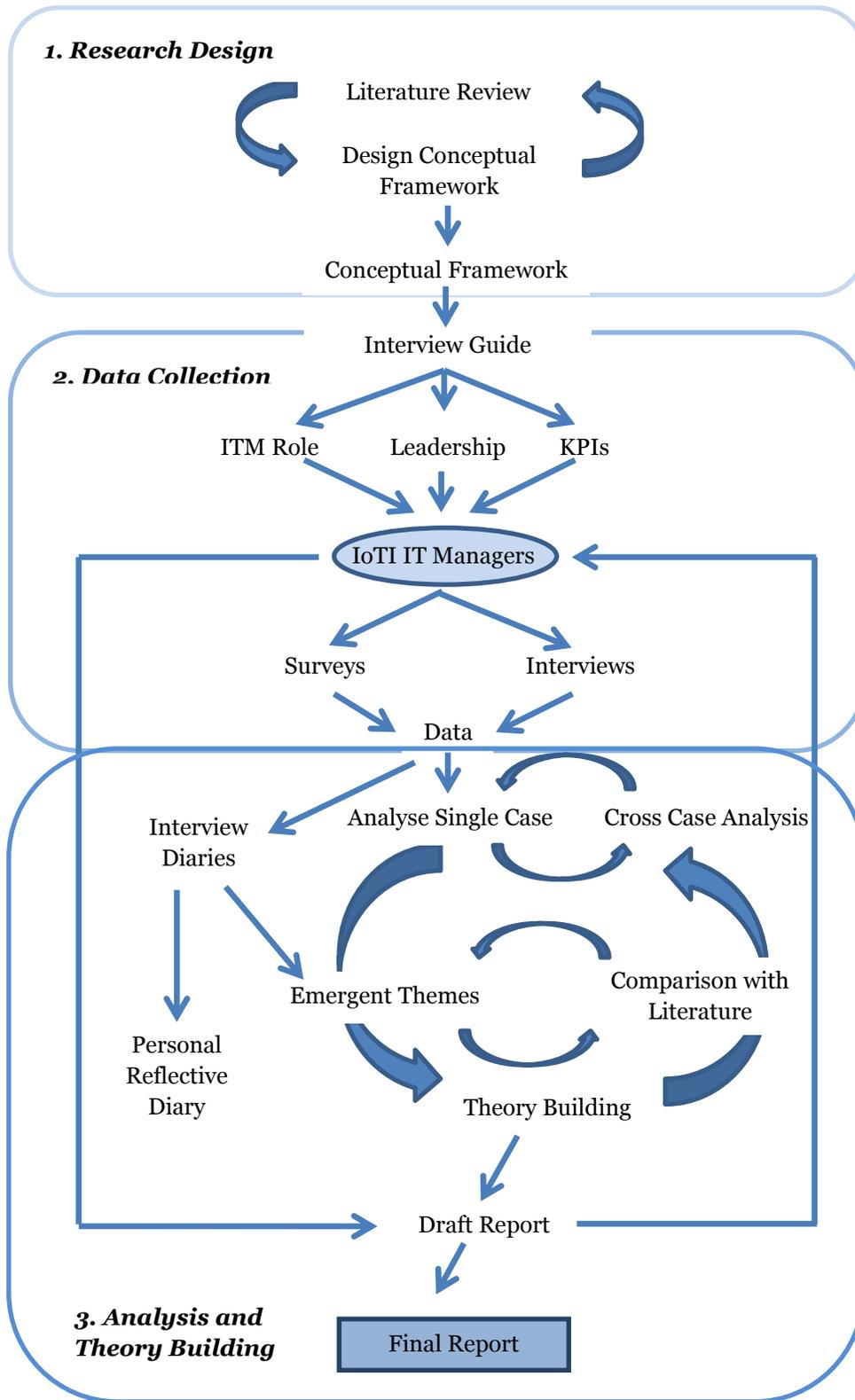


Figure 8: Research Protocol Diagram

Once the first interview has been completed the process of analysis and theory building can begin. The first step in the process is to code the transcribed interview and import it into NVivo (a software package used for qualitative research analysis) for analysis. The coding process is where the essence of the interview is identified and emergent similar and differing themes are grouped together for the meaning to be extracted from them. This involves much iteration until no new themes can be identified, after which the work on writing the report can begin. Even at the report writing stage, the researcher expects to have to revisit the data as the act of writing the report itself can add further interpretation to the process. As further interviews are completed this highly iterative process continues *“by recognizing patterns of relationships among constructs within and across cases and their underlying logical arguments”* (Eisenhardt and Graebner, 2007, p. 25).

At this stage, the initial findings will be brought back to the group of IT Managers for verification. If possible, this will be scheduled in around a regular IT Manager meeting where all or most of the group will be gathered for a meeting and might agree to extend it to review the findings of this study. Other than that, the draft findings will be discussed individually with individual IT Managers for comment before finalising the theory and finishing the final report.

Conclusion

At this stage, prior to the research having been conducted, it is impossible to draw conclusions about the effectiveness of IT Managers in the IoTI sector. However, it is possible to say that the researcher has confidence in the chosen research paradigm and contextual framework which has been developed. This is based on the review of literature on IT Manager/CIO effectiveness and on the extant literature of research paradigms and methodology. The philosophy supporting the decision to use multiple case studies will be presented in the next section.

Appendix A: Interview Guide

Remember Yin (1994) skills required by the field researcher:

- To be able to ask good questions and interpret the answers.
- To be a good listener and not be trapped by preconceptions.
- To be adaptable and flexible, to see newly encountered situations as opportunities not threats.
- To have a firm grasp of the issues being studied.
- To be unbiased by pre-conceived notions, and thus receptive and sensitive to contradictory evidence.

Before you start:

- Thank the IT Manager for taking part
- Explain the research again – effectiveness of IT Managers in IoTI. Title: The Role of the IT Manager in the Institutes of Technology in Ireland
- Explain the format of the interview and how long it is likely to take
- Guarantee confidentiality and that all data used in the report will be anonymised
- Confirm permission to record VC
- Confirm that on-line leadership study has been completed and that both of you are looking at the results. This is what will inform the Leadership section of the questionnaire.

1. CIO Role, Peppard

Scope of the role: the intention of this section of the interview is to clarify the role that you play as IT Manager in your Institute. This is also an enquiry into the IT maturity of the organisation, especially at CxO level.

Scope of the Role

Who do you report to?

How long have you been in the position?

Have you seen your role evolve during this time?

How do you see the role evolving in the future?

How would you describe the importance the Institute places in your knowledge of the business of the Institute versus your technical knowledge?

How is this knowledge used to identify opportunities to develop IT in the Institute?

How does the Institute use your skills as an IT Manager to get better value from investment in IT?

How does the Institute use your skills as an IT Manager to develop an agile infrastructure?

Would you say that you have a strategic input into any aspect of the Institute?

Issues Critical to Success: the intention of this section is to establish the importance of the role that you play as IT Manager in your Institute

Issues Critical to Success

How would you describe the most important functions that you carry out?

How important is it for you to attend senior management meetings?

How important is strategy to your job?

How important is it to you to prepare the Institute for new technologies?

How important is it to you to maintain service levels?

How important is it to you to identify emerging technology?

Performance Metrics: the intention of this section is to establish the important performance metrics that you would use to measure your own effectiveness

Performance Metrics

What would you say are the most important indicators of success of your role?

What would you say are the most important indicators of success of your role by the senior management team?

How would you measure the success of any innovation or project that you were involved in?

Would you consider ROI to be important?

Would you consider user satisfaction to be important?

Challenges: the intention of this section is to establish the major challenges that you encounter

Challenges

What are the most serious challenges that you face in your job?

Do you have difficulties delivering on the expectations of the role?

Do you consider understanding of the business to be a challenge?

Do you consider face time with senior executives or other managers to be a challenge?

Is governance a problem for you in your job?

Do you encounter challenges with managing intelligent or demanding users?

Do you encounter challenges with setting technical standards and policies?

Relationship with CxOs: the intention of this section is to establish your relationships with other staff in the Institute.

Relationship with CxOs

How important is it for you to interact with senior staff?

How do you think your role would be viewed by senior management in the Institute?

How is the ICT agenda set in your Institute?

How would you rate the digital literacy of the President?

How would you rate the digital literacy of the rest of the senior management team – do they understand IT?

Leadership required for the Five States: this section tries to identify which of the five states of maturity the Institute currently exists in and hence the type of role expected of the ITM

Five States Questions

How important is your contribution to maintaining accurate and up to date information for business and strategic purposes?

How important is use of information in your Institute?

How would you rate the information capabilities of your Institute?

How integrated is the use of information across your Institute?

2. The New CIO Leader, Broadbent and Kitzis

The New CIO Leader's Top Ten Priorities



Questions on the Leadership online survey

What were your impressions of the survey – did it apply to you? All sections?

Your strong points were xxx, could you please explain why you think that this is the case?

Your weak points were xxx, could you please explain why you think that this is the case?

Did you learn anything about your own role or leadership style by simply doing the survey?

3. KPIs, Mitra

This section attempts to discover what dimensions of ICT that stakeholders find important.

Performance and Value Metrics questions

In discussing suitable operations or IT performance metrics of existing IT for your department, which items would stakeholders be most likely to include?

In discussing suitable project metrics for your Institute, which items would stakeholders be most likely to include?

In deciding on measures to capture the impact of IT innovation on the Institute, which items would stakeholders be most likely to include?

What measures would you use to measure the performance of IT Services?

What measures, if any, would you use to measure the contribution of IT to business processes?

What measures, if any, would you use to measure the contribution of IT to a school or to the IoT?

How does the President and the rest of the senior management team assess the value of IT?

Communicating Value

How do you communicate the value provided by IT to other heads?

Do you know if metrics used for IT have changed in the last five years?

When the interview is over:

- Thank the interviewee
- Once again give assurance of confidentiality
- Ask if it is okay to come back for clarification if necessary

References

- Benbasat, I., Goldstein, D. K. and Mead, M. (1987) 'The Case Research Strategy in Studies of Information Systems', *MIS Quarterly*, pp. 369 - 386.
- Brannen, J. (2005) 'Mixing methods: The entry of qualitative and quantitative approaches into the research process', *International Journal of Social Research Methodology*, Vol. 8, No. 3, pp. 173-184.
- Brannen, J. and Coram, T. (1992) *Mixing methods: Qualitative and quantitative research*, Avebury Aldershot.
- Broadbent, M. and Kitzis, E. (2004) *The new CIO leader: setting the agenda and delivering results*, Harvard Business Press.
- Bryman, A. (2004) *Social Research Methods*, Second Edition Edn. OUP Oxford.
- Bryman, A. (2006) 'Integrating quantitative and qualitative research: how is it done?', *Qualitative research*, Vol. 6, No. 1, pp. 97-113.
- Chun, M. and Mooney, J. (2009) 'CIO roles and responsibilities: Twenty-five years of evolution and change', *Information & Management*, Vol. 46, No. 6, pp. 323-334.
- Creswell, J. W. (2008) *Research design: Qualitative, quantitative, and mixed methods approaches*, Sage Publications, Incorporated.
- Denzin, N. and Lincoln, Y. (1998) 'Strategies of qualitative inquiry'.
- Denzin, N. K. and Lincoln, Y. S. (2008) *Collecting and interpreting qualitative materials*, Sage Publications, Incorporated.
- Dyer, W. G. and Wilkins, A. L. (1991) 'Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt', *Academy of Management Review*, Vol. 16, No. 3, pp. 613-619.
- Easterby-Smith, M., Thorpe, R., Jackson, P. and Lowe, A. (2008) *Management research*, SAGE Publications Limited.
- Eisenhardt, K. M. (1989) 'Building theories from case study research', *Academy of Management Review*, pp. 532-550.
- Eisenhardt, K. M. and Graebner, M. E. (2007) 'Theory building from cases: Opportunities and challenges', *Academy of Management Journal*, Vol. 50, No. 1, pp. 25-32.
- Enns, H. G., Huff, S. L. and Higgins, C. A. (2003) 'CIO lateral influence behaviors: Gaining peers' commitment to strategic information systems', *MIS Quarterly*, Vol. 27, No. 1, pp. 155-176.

- Gibson, W. and Brown, A. (2009) *Working with qualitative data*, Sage Publications Limited.
- Gill, J. and Johnson, P. (2002) *Research methods for managers*, Sage Publications Limited.
- Gomm, R., Hammersley, M. and Foster, P. (2000) *Case study method: Key texts, key issues*, Sage.
- Gottschalk, P. (2000) 'The Chief Information Officer: A Study of Managerial Roles', *International Journal of Technology, Policy and Management*, Vol. 2, No. 2/2002000, pp. 93-101.
- Greene, J. C. (2006) 'Toward a methodology of mixed methods social inquiry', *Research in the Schools*, Vol. 13, No. 1, pp. 93-98.
- Guba, E. G. and Lincoln, Y. S. (1982) 'Epistemological and methodological bases of naturalistic inquiry', *ECTJ*, Vol. 30, No. 4, pp. 233-252.
- Guba, E. G. and Lincoln, Y. S. (1989) *Fourth generation evaluation*, SAGE Publications, Incorporated.
- Hardesty, D. M. and Bearden, W. O. (2004) 'The use of expert judges in scale development: Implications for improving face validity of measures of unobservable constructs', *Journal of Business Research*, Vol. 57, No. 2, pp. 98-107.
- Henn, M., Weinstein, M. and Foard, M. N. (2005) *A short introduction to social research*, SAGE Publications Limited.
- Hogan, J., Dolan, P. and Donnelly, P. (2009) *Approaches to Qualitative Research Theory & its Practical Application*, Cork: Oak Tree Press.
- Kelliher, F. (2005) 'Interpretivism and the pursuit of research legitimisation: an integrated approach to single case design', *The Electronic Journal of Business Research Methodology*, Vol. 3, No. 2, pp. 123-132.
- Kerlinger, F. N. (1986) *Foundations of Behavioral Research Third Edition*, Florida: Harcourt Brace College Publishers.
- Kurke, L. B. and Aldrich, H. E. (1983) 'Mintzberg was right!: A replication and extension of the nature of managerial work', *Management science*, pp. 975-984.
- Lau, A. W., Newman, A. R. and Broedling, L. A. (1980) 'The nature of managerial work in the public sector', *Public Administration Review*, Vol. 40, No. 5, pp. 513-520.
- Lee, A. S. (1991) 'Integrating positivist and interpretive approaches to organizational research', *Organization science*, pp. 342-365.

- Luthans, F. (1988) 'Successful vs. effective real managers', *The Academy of Management Executive* (1987-1989), Vol. 2, No. 2, pp. 127-132.
- Maditinos, D. I., Kokkinos, N. C. and Papadopoulou, M. (2012) 'Chief Information Officers' roles and responsibilities in the Greek Industry '.
- Marginson, S. and Wende, M. (2007) 'Globalisation and higher education'.
- Marks, A. and Rezgui, Y. (2011) 'IT Leadership in Higher Education: The CIO Candidate', *IT Professional Magazine*, Vol. 13, No. 3, pp. 52-56.
- Maxwell, J. A. (1992) 'Understanding and validity in qualitative research', *Harvard educational review*, Vol. 62, No. 3, pp. 279-301.
- McCall, M. W. and Segrist, C. A. (1980) *In Pursuit of the Manager's Job: Building on Mintzberg*, Center for Creative Leadership.
- McGrath, J. E. (1984) *Groups: Interaction and performance*, Prentice-Hall Englewood Cliffs, NJ.
- McLean, E. R. and Smits, S. J. (2012) 'Management, Leadership, and the Roles of the CIO'.
- Meredith, J. (1998) 'Building operations management theory through case and field research', *Journal of Operations Management*, Vol. 16, pp. 441-454.
- Miles, M. B. and Huberman, A. M. (1984) *Qualitative data analysis: A sourcebook of new methods*, Sage publications.
- Miles, M. B. and Huberman, A. M. (1994) *Qualitative data analysis: An expanded sourcebook*, SAGE publications, Inc.
- Mintzberg, H. (1971) 'Managerial work: analysis from observation', *Management science*, pp. 97-110.
- Mintzberg, H. (1973) *The nature of managerial work*, New York: Harper & Row.
- Mitra, S., Sambamurthy, V. and Westerman, G. (2011) 'Measuring IT Performance and Communicating Value', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 47-59.
- Morse, J. M., Barrett, M., Mayan, M., Olson, K. and Spiers, J. (2008) 'Verification strategies for establishing reliability and validity in qualitative research', *International journal of qualitative methods*, Vol. 1, No. 2, pp. 13-22.
- Onwuegbuzie, A. J. and Leech, N. L. (2005) 'On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies', *International Journal of Social Research Methodology*, Vol. 8, No. 5, pp. 375-387.

- Peppard, J., Edwards, C. and Lambert, R. (2011) 'Clarifying the Ambiguous Role of the CIO', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 31-44.
- Preston, D. S., Leidner, D. E. and Chen, D. (2008) 'CIO leadership profiles: implications of matching CIO authority and leadership capability on IT impact', *MIS Quarterly Executive*, Vol. 7, No. 2, pp. 57-69.
- Punch, K. F. (2005) *Introduction to social research: Quantitative and qualitative approaches*, Sage Publications Limited.
- Richards, L. (2005) *Handling qualitative data: A practical guide*, Sage Publications Limited.
- Schofield, J. W. (2002) 'Increasing the generalizability of qualitative research', *The qualitative researcher's companion*.
- Smaltz, D. H., Sambamurthy, V. and Agarwal, R. (2006) 'The antecedents of CIO role effectiveness in organizations: An empirical study in the healthcare sector', *Engineering Management, IEEE Transactions on*, Vol. 53, No. 2, pp. 207-222.
- Stake, R. E. (1978) 'The case study method in social inquiry', *Educational researcher*, pp. 5-8.
- Stake, R. E. (1995) *The art of case study research*, Sage Publications, Incorporated.
- Stake, R. E. (2005) *Qualitative case studies*, Sage Publications Ltd.
- Stephens, C. S., Ledbetter, W. N., Mitra, A. and Ford, F. N. (1992) 'Executive or functional manager? The nature of the CIO's job', *MIS Quarterly*, pp. 449-467.
- Stewart, R. (2007) 'Studies of managerial jobs and behaviour: the ways forward', *Journal of Management Studies*, Vol. 26, No. 1, pp. 1-10.
- Tengblad, S. (2006) 'Is there a 'New Managerial Work'? A Comparison with Henry Mintzberg's Classic Study 30 Years Later*', *Journal of Management Studies*, Vol. 43, No. 7, pp. 1437-1461.
- Voss, C., Tsiriktsis, N. and Frohlich, M. (2002) 'Case research in operations management', *International journal of operations & production management*, Vol. 22, No. 2, pp. 195-219.
- Yin, R. K. (1981) 'The case study crisis: Some answers', *Administrative Science Quarterly*, Vol. 26, No. 1, pp. 58-65.
- Yin, R. K. (1994) *Case Study Research*, Beverly Hills, CA: Sage.

Linking Narrative

The presentation of papers which are included in this thesis happened over a two year period during which research was continuing and the study was being formed. The papers therefore represent a snapshot of thinking at the time of writing but also chronicle the benefits of reflection through the research process. For this reason there can appear to be a shift in approach from one paper to the next which might be unexplained unless a linking narrative such as this is included. It is a major part of the DBA process that the researcher engages in reflective practice and as a result may end up changing course to match the deeper understanding of the subject matter and growing research literacy of the researcher. What initially may have appeared to be the obvious course to take, on reflection, may have to be changed to accommodate deeper analysis and findings along the research journey (Ferraro, 2000).

Such a shift in approach occurred in the type of instrument that was to be used for the study; originally the concept was to develop an online study which was to enquire into all aspects of IT management in the sector. Based on the three supporting works: “*The New IO Leader Setting the Agenda and Delivering Results*” (Broadbent and Kitzis, 2004), “*Clarifying the Ambiguous Role of the CIO*” (Peppard *et al.*, 2011) and “*Measuring IT Performance and Communicating Value*” (Mitra *et al.*, 2011), the original approach was to adapt the online survey that came with the Broadbent and Kitzis book to edit out language that may appear foreign to ITMs in the public sector, i.e. references to shareholders and to profit and loss, and to expand it to include all the concepts of the other two studies. All ITMs in the IoTI sector were to be contacted to complete the survey and analysis was to be through statistical analysis package SPSS.

After presenting this as a strategy it was realised that there was a flaw with this approach; excluding the researcher himself the sample was to be of 100% of the population of ITMs in the sector so statistics were not going to be of any use in predicting how the remainder of the population might act. The sample of twelve ITMs was also too small to predict general ITM effectiveness. The significant Mintzberg study “*The Nature of Managerial Work*” (Mintzberg, 1973) which enquired into general management effectiveness was criticised for only studying five CEOs although it clearly made a very substantial contribution to the field over the 35 years since its publication (Martinko and Gardner, 1985; Lamond, 2003; Tengblad, 2006), being cited by over 8,000 papers since publication (Google Scholar). So it was recognised that from a statistical point of view and from the point of view of having any validity that with a sample population of twelve ITMs a change of approach was needed. The subject matter of the research was the same; ITM effectiveness, it was just recognised that the paradigm was not. The goal of developing a hypothesis on ITM effectiveness was unachievable in the current format however developing a method of assessing ITM effectiveness was worth addressing as no such measure existed and it would contribute to an understanding of what ITM effectiveness is.

Throughout the investigation for the methodology and philosophy papers it became apparent to the researcher that a constructivist/interpretivist approach to the study was the most appropriate route to take. This also directed the research away from the original concept of a positivist theory building exercise which would have required a greater longitudinal study than this exercise allowed for involving observation of cause and effect and the research was once again confirmed as becoming a journey into identifying a method of measuring effectiveness rather than developing a theory on ITM effectiveness. The method chosen could be used in further studies to test a theory on ITM effectiveness. Thus the focus shifted from attempting to predict and control to one of diagnosis and understanding. This is also more appropriate to the use of case study as it “*attends to the idiosyncratic more than to the pervasive*” (Stake, 1978, p. 7) which is a characteristic of case studies.

Having understood the need and accepted that the study was now to change direction from a completely online one to something else, the alternative had to be developed. The approval process for the study involved seeking cooperation and permission from the group of ITMs at one of the regular ITM meetings and during discussions it was clear that many of the ITMs had as many questions about the study as the researcher had about ITM effectiveness. To address these questions the Broadbent and Kitzis online study was issued to the group as a means of demonstrating the type of topics to be covered by the study but it was also recognised that by not tampering with the study that the results could be compared with peer ITMs who had previously taken the test. This became an invaluable benchmark used to compare this group of ITMs with others around the world. As the researcher himself had taken this online test prior to reading the book, these results were there to be used and were included in the overall findings to produce a 100% participation rate of ITMs in the sector in the study. As the online test was taken by the researcher as part of researching ITM effectiveness and prior to deciding to use it any further in the study any fear of it being subject to undue researcher bias were discounted. Also when the overall results are examined with and without the researcher results included, there are no appreciable differences in the results. It was also uncovered through the follow up interviews that a further added benefit of exposing all ITMs in the sector to this test prior to the interviews was that the ITMs had a score of their own leadership traits which they could use themselves to enhance their own abilities, similar to the way that previous studies had used individual competency scores to help participants improve skills in other areas (Copeland and Hewson, 2000).

Thus a comparative score for ITM leadership was derived with questions of role ambiguity and measures of performance and the extent of communicating value to be answered. As the study had now moved on to be more interpretivist than originally planned qualitative data was required and richer qualitative data than what might be gathered through online surveys. To this end an interview guide was developed around the key topics of the Peppard and Mitra studies and appointments were made with each of the ITMs in the sector to go and visit them in their own

offices to conduct the interviews. This also allowed for an assessment of the influence of environment on ITM effectiveness.

References

- Broadbent, M. and Kitzis, E. (2004) *The new CIO leader: setting the agenda and delivering results*, Harvard Business Press.
- Copeland, H. L. and Hewson, M. G. (2000) 'Developing and testing an instrument to measure the effectiveness of clinical teaching in an academic medical center', *Academic Medicine*, Vol. 75, No. 2, pp. 161-166.
- Ferraro, J. M. (2000) 'Reflective practice and professional development. ERIC Digest', *Washington, DC: ERIC Clearinghouse on Teaching and Teacher Education, American Association of Colleges for Teacher Education*.
- Lamond, D. (2003) 'Henry Mintzberg vs Henri Fayol: Of Lighthouses, Cubists and the Emperor's New Clothes', *Journal of Applied Management and Entrepreneurship*, Vol. 8, No. 4, pp. 5-28.
- Martinko, M. J. and Gardner, W. L. (1985) 'Beyond structured observation: Methodological issues and new directions', *Academy of management review*, Vol. 10, No. 4, pp. 676-695.
- Mintzberg, H. (1973) *The nature of managerial work*, New York: Harper & Row.
- Mitra, S., Sambamurthy, V. and Westerman, G. (2011) 'Measuring IT Performance and Communicating Value', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 47-59.
- Peppard, J., Edwards, C. and Lambert, R. (2011) 'Clarifying the Ambiguous Role of the CIO', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 31-44.
- Stake, R. E. (1978) 'The case study method in social inquiry', *Educational researcher*, pp. 5-8.
- Tengblad, S. (2006) 'Is there a 'New Managerial Work'? A Comparison with Henry Mintzberg's Classic Study 30 Years Later*', *Journal of Management Studies*, Vol. 43, No. 7, pp. 1437-1461.

Paper 3: Philosophy

Abstract

We all have our own beliefs, likes and dislikes when it comes to passing any assessment on any social situation that we may encounter. In most situations in life, we may form deeply held opinions on subjects without ever giving any thought to these beliefs or preferences. However, when conducting research into any topic where the results are to be written up for others to assess, or where the researcher simply wants to have more confidence in the results of their own work, then it is important to understand the influence that the researcher's own background can have in shaping their interpretation of results. Issues such as understanding what the researcher considers reality to be (ontology) and how the researcher knows that they are acquiring knowledge (epistemology) are very important and influenced by the researcher's own personal and cultural background and experiences. The question of whether one sees what one believes or whether one believes what one sees is very relevant to any researcher and anyone who wants to read the results of the research.

Keywords: Ontology, epistemology, research paradigm.

Introduction

This paper builds on the previous paper where a constructivist/interpretivist approach to research was identified from the literature as the most appropriate form of enquiry for this study (Stake, 1978; Yin, 1981; Guba and Lincoln, 1989; Lee, 1991; Miles and Huberman, 1994; Gomm *et al.*, 2000; Greene, 2006; Easterby-Smith *et al.*, 2008). This paper also sets out to present the assumptions made about the nature of truth and reality and what can be said to exist (ontology) and to explain the philosophy behind the acquisition of knowledge (epistemology). These dual concepts of ontology and epistemology are at the core of any choice about research paradigm (Guba and Lincoln, 1994) and are important to understand in order to clarify the evidence required to underpin the study and how this evidence should be gathered and interpreted (Easterby-Smith *et al.*, 2008). They also help in exposing and understanding any existing assumptions or researcher bias in order that their impact on the study might be minimised and confidence in the findings might be bolstered “*Without unpacking these assumptions and clarifying them, no one (including ourselves!) can really divine what our research has been or what it is now saying*” (Crotty, 1998, p. 17). By identifying the underlying research philosophy, the researcher may also uncover new possibilities or rich seams of research activity which may not otherwise have been considered.

One of the first questions which must be considered when pondering the philosophical stance of the researcher is what to research. For this study, this question has already been answered; it is the effectiveness of IT managers in the IoTI sector. Three seminal works were chosen from the literature: CIO Role (Peppard *et al.*, 2011), New CIO Leadership (Broadbent and Kitzis, 2004) and appropriate KPIs applied to an IT Manager to measure performance and ability to communicate IT value (Mitra *et al.*, 2011) which the researcher combines into an aggregate assessment of IT Manager effectiveness.

Every researcher has their own personal likes and dislikes (James and Vinnicombe, 2002), each of which offers choices which can influence the research paradigm, or the progress of the research in practice. The choices that the researcher makes must ensure that the final design is connected back to the original research problem (Blaikie, 2009; Collis and Hussey, 2009). If this is not achieved, then there is likely to be a disconnect with the final results and the original intentions of the research. The chosen research paradigm is a reflection of the researcher’s beliefs which govern the subsequent study (Guba and Lincoln, 1994).

In the case of this study into IT Manager effectiveness, the core ontological and epistemological questions are:

1. Is there a truth which can be uncovered either across the sector or in each case? (Ontology)
2. What evidence is required to support the truth? (Epistemology)

To answer these questions is to enquire into the basic philosophical beliefs of the researcher. The answers “*are not open to proof in any conventional sense*” (Guba and Lincoln, 1994, p. 108) rather,

they are a statement of the lenses through which the researcher approached the study. This study will concentrate on enquiring into the experiences and opinions of IT Managers, individually and collectively with regards to certain key aspects of IT Management effectiveness which have been identified in the literature. This will focus on the sense that IT Managers make of their similar but different situations based on the fact that they are all doing, on paper at least, the same jobs but in different Institutes, each of which could possibly have a unique culture and set of traditions. As all Institutes in the sector are governed by the same legislation and operate in the same market, it is the differences that are found in each Institute as much as the similarities that will be of interest as opposed to the effects of any external stimuli which should largely affect all Institutes equally.

The focus of this study is a person in the form of the IT Manager employed in each of the Institutes of Technology in Ireland and their effectiveness in their respective Institutes and their combined influence in the sector. Thus the study involves enquiring into human actions and behaviour in the workplace which by default places the study in the realm of the social (Berger and Luckmann, 1992) and outside the realms of natural science.

Is there a truth which can be uncovered? (Ontology)

“What is the form and nature of reality and, therefore, what is there that can be known about it” (Guba and Lincoln, 1994, p. 108)? The implications of these questions for this study are to enquire as to whether the reality of IT Management effectiveness exists external to the individual or is simply a product of the individual’s consciousness (Burrell and Morgan, 1979). The external/internal perspectives of reality have been the subject of much debate in the research literature and the terms nominalism or realism and relativism have been used to identify the opposing views (Burrell and Morgan, 1979; Nola, 1988; Guba and Lincoln, 1994; Burr, 1998; Easterby-Smith *et al.*, 2008). Realists hold the position that *“the world is concrete and external, and that science can only progress through observations that have a direct correspondence to the phenomena being investigated”* (Easterby-Smith *et al.*, 2008, p. 61). On the other hand, relativism holds the view of reality as taking the form of *“multiple, intangible mental constructions, socially and experientially based, local and specific in nature (although elements are often shared among many individuals and even across cultures), and dependent for their form and content on the individual persons or groups holding the constructions.”* (Guba and Lincoln, 1994, pp. 110 -111). These constructions are not regarded as being more or less true in any absolute terms; rather they should be viewed as more or less informed or sophisticated and may even change over time depending on circumstances and context (Mills *et al.*, 2008)

The reality which this study is investigating is the truth about IT management effectiveness held by a group of IT managers in the IoTI sector. Therefore the truth which is to be uncovered is that reality which *“is determined by people rather than by objective and external factors”* (Easterby-Smith *et al.*, 2008, p. 59). Just like managers in general, these jobs entail *“working with people –*

not just as bosses and subordinates but, more important, as colleagues and partners” (Gosling and Mintzberg, 2003, p. 6). To uncover the truth therefore of ITM managerial work means enquiring into the nature of it and not the functions of it; where people see the role fitting in the organisation and how the effectiveness of the role might be measured. The conceptual framework developed previously reflects this with the emphasis on leadership qualities, connectedness with senior managers in the Institutes and appropriate measures to assess performance.

What evidence is required to support the truth? (Epistemology)

“What is the nature of the relationship between the knower and the would-be knower and what can be known” (Guba and Lincoln, 1994, p. 108)? This is the essence of the epistemological question in research and is often addressed at the same time as the ontological question (Crotty, 1998; Easterby-Smith *et al.*, 2008). Various attempts have been made to categorise the opposing views of the different ways in which this question can be answered. One approach is to distinguish between positivism and social constructionism (Easterby-Smith *et al.*, 2008). *“The key idea of positivism is that the social world exists externally, and that its properties should be measured through objective methods, rather than being inferred subjectively through sensation, reflection or intuition”* (Easterby-Smith *et al.*, 2008, p. 57). Positivism is derived from natural sciences where the focus is on identifying causality through hypothesis and deduction by reducing problems to the simplest possible elements. The researcher should remain independent of what is being observed, the choice of what to study should remain objective and separated from human beliefs and interests. Accepting that we cannot be positive *“about our claims of knowledge when studying the behaviour and actions of humans”* (Creswell, 2003, p. 7) to the level of certainty required by positivism, suggests that there must be another way of researching social sciences. This other way is called anti-positivism or social constructionism.

At the heart of social constructionism is the belief that humans construct their own reality through social interaction (Creswell, 1994; Guba and Lincoln, 1994; Zuriff, 1998). In this paradigm, the researcher becomes part of what is being observed, and understands that human interests are the main drivers of science. The researcher also understands that unlike the natural world, the “subjects” of the research are humans who have opinions on the social world that they inhabit (Gill and Johnson, 2002; Bryman, 2004). The aim of social constructionism is to increase the general understanding of a situation and the goal is to gather rich data from which ideas are induced. The unit of analysis may include the complexity of *“whole” situations and sampling may be based on small numbers of cases chosen for specific reasons*” (Easterby-Smith *et al.*, 2008). This is because the researcher understands that *“the social world cannot be reduced to isolated variables, such as space and mass, it must be observed in its totality”* (Shaw, 1999, p. 60).”

Crotty (1998) further identified three epistemological categories: Objectivism, Subjectivism and Constructionism. Objectivism is seen as having the same properties as positivism with knowledge

being treated as an external object. Subjectivism is similar to social constructionism treating knowledge in the social world as depending exclusively on a person's subjective awareness of it while constructionism lies somewhere in between the two; neither completely objective nor completely subjective but constructed by people based on their opinions and experiences of their own social worlds. It would therefore seem justifiable to root this study in the social constructionist side of social sciences as in the social world realities are socially constructed; the *"most ardent positivist would find that hard to contradict"* (Crotty, 1998, p. 55). A researcher in this area however needs to guard against being too subjective as there can be a tendency *"to take the sense we make of things' to be "the way things are". We blithely do that and, just as blithely, hand on our understandings as quite simply "the truth" (Crotty, 1998, p. 59).*

The study then is an enquiry into the meanings that people make of their experiences rather than a process of gathering hard facts to measure how often certain events or patterns occur. The focus is on individual IT Managers and also on the entire group of IT Managers as a collective to understand what they are thinking and feeling and how they communicate within their own Institutes and with each other. Of particular interest will be the variations in experiences across the sector as much as the similarities *"rather than a search for external causes and fundamental laws to explain behaviour. Human action arises from the sense that people make of different situations, rather than as a direct response to external stimuli"* (Easterby-Smith *et al.*, 2008, p. 59).

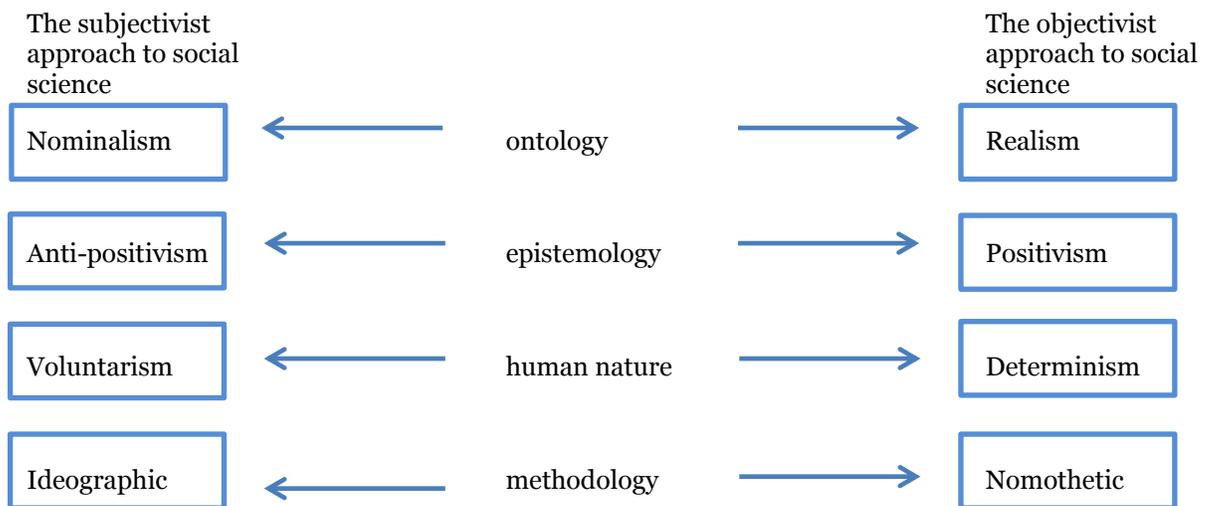
Human Nature and Methodology

A much referenced book on research paradigms and assumptions about the nature of social science is by Burrell and Morgan (1979) (Chia and Chia, 1996; Deetz, 1996; Goles and Hirschheim, 2000; Chan, 2001; Cunliffe, 2003; Lundberg and Young, 2005; Karami *et al.*, 2006; Zimmermann, 2011) in which a scheme for analysing the nature of social science is proposed (Table 4) which includes ontology and epistemology as discussed earlier but also included are the effects of human nature and methodology on social science research which are considered to be associated with but conceptually separate from ontology and epistemology (Burrell and Morgan, 1979).

To decide on what influence human nature has on research is to decide on what influence the environment in which a person inhabits exerts on the actions that they take. The deterministic view is that people respond to their environment almost as if they were programmed in a mechanistic way. *"According to it, a person in a given situation may think that he is able to do this or that, but in every case the stars, the laws of physics, his character, the conditioning he has received or something else makes him unable to do any but one thing"* (Cowburn, 2008, p. 144). On the other hand, researchers who subscribe to a more voluntarism outlook ascribe to a *"much more creative, free-will approach to humans, treating them as agents able to create their environment by their thoughts and actions"* (Lane, 2001, p. 102). As the Institutes of Technology are subjugated to

national legislation and governed by statutory bodies⁹ and subject to regular audits, it might be easy to adopt a model of man with no free-will at all in any action taken and completely controlled by the environment. However, this would be to ignore the creativity exhibited in the sector over the years which has seen it grow from humble beginnings in the 1970s to currently catering for 50% of the third level students in the country. This researcher then prefers to “*adopt an intermediate standpoint which allows for the influence of both situational and voluntary factors in accounting for the activities of human beings*” (Burrell and Morgan, 1979, p. 6).

Table 4 The subjective – objective dimension



A scheme for analysing assumptions about the nature of social science (Burrell and Morgan, 1979, p. 3)

The assumptions made about methodology are determined by which view the research ascribes to; ideographic or nomothetic. The ideographic approach stresses the need to understand, first hand, the unique wisdom and interpretations that the subjects under investigation have about their world. To do this the researcher is required to get close to that world to understand the flow of the everyday life through the eyes of the subject(s). The nomothetic approach, on the other hand, emphasises the importance of measurement, protocol and more general concepts; an approach more often found in natural science (Burrell and Morgan, 1979; Lane, 2001). As the conceptual framework for this study guides the researcher to discover the insights and interpretations of IT managers in the sector, it follows that the process of enquiry will follow an ideographic approach.

⁹ <http://www.hea.ie/> for further information on statutory regulation of IoTs

Unit of Analysis

Having decided on an ideographic approach to case study, the question of identifying the appropriate unit of analysis is addressed. There are thirteen Institutes of Technology in Ireland and as the researcher is employed as an IT Manager himself in one of the Institutes, this leaves twelve Institutes to be studied. These twelve Institutes then constitute the cases on which the study is based which combine into a multiple case study (Benbasat *et al.*, 1987; Yin, 1994; Meredith, 1998; Grünbaum, 2007; Baxter and Jack, 2008). However, there are unanswered important questions about epistemological aspects of research for the reason that at “*the moment conceptually stringent guidelines are not available to differentiate between unit of analysis and the case*” (Grünbaum, 2007, p. 79).

Nonetheless there is some agreement amongst researchers that the case is the unit of analysis (Yin, 1994; Patton, 2002). However, even Patton (2002) agrees that the “*key issue in selecting and making decisions about appropriate unit of analysis is to decide what it is you want to be able to say something about at the end of the study*” (Patton, 2002, p. 229). This research attempts to say something about the role of the IT manager in the IoTI sector in Ireland thus suggesting that the unit of analysis is the IT manager. The problem with this is that there is no IT manager for the sector, rather there are thirteen individual IT managers working in thirteen separate Institutes around the country. The intention is to identify the idealised role, recognising that it can be confusing and complicated and then comparing what can exist with what does exist. This “*requires not a knack for simplification but the ability to synthesize insights from different mind-sets into a comprehensible whole*” (Gosling and Mintzberg, 2003, p. 1).

In an earlier work, Yin (1981) compares cross-case analysis with generalisations made from cross-experiment and suggests a parallel can be drawn between the use of units of analysis in scientific experiments and in case studies; “*the logic used to bring together a string of experiments is the same as that used to connect a string of case studies*” (Yin, 1981, p. 63). In this research the logic would be to conduct similar structured interviews in all of the Institutes with their respective IT managers which takes into account local and national context and to then analyse the resultant data against the role of a sector-wide IT manager. To achieve this the idealised role of an IT manager was first deconstructed from the role of a manager with the aid of the literature and then reconstructed into the ideal IT manager for the sector (Baxter and Jack, 2008). This is the basis for the conceptual model discussed previously and suggested that the focus should be on leadership, the role of the CIO and appropriate KPIs to measure performance and ability to communicate IT value.

Communities of Practice

The context in which a manager works has been identified as significant in determining effectiveness. (Benson *et al.*, 1991; O'Toole and Meier, 1999; Mintzberg and Gosling, 2002; Mandell and Steelman, 2003). Figure 9 illustrates, the various mind-sets that a manager must be capable of

calling on according to Mintzberg and Gosling (2002, p. 68). Everything, we are told, that an effective manager does is “*sandwiched between reflection and action. Managers work where thoughtful thinking meets practical doing*” (Mintzberg and Gosling, 2002, p. 68). Effective action is described as occurring on three levels: 1) concerns people and their interpersonal relationships, 2) is that of the organisation, where we find the greatest attention to analysis and 3) is context, encompassing the world around the organisation (Mintzberg and Gosling, 2002).

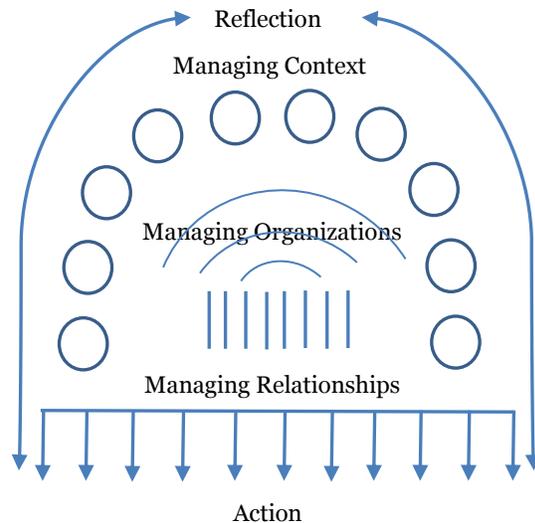


Figure 9 The Five Mind-Sets (Mintzberg and Gosling, 2002, p. 68)

Taking context first. The ITMs are employed in the state funded IoTI education system in Ireland. Each Institute is governed by the same legislation and they all operate in the same market attracting the bulk of their new entrants each year through the national Central Applications Office (CAO)¹⁰. Each Institute is also autonomous with its own Governing Body, Executive Board and Academic Council responsible for running the Institutes within the bounds of the national legislation. There are regular meetings (one per quarter) each year of the group of ITMs employed in the sector to discuss various issues of common concern. There is also an active mailing list to which all the IT managers are subscribed to where questions of common interest are regularly posted and discussed. Individual ITMs are routinely selected to participate in applicable national committees to canvas opinion on behalf of the sector or set the agenda for relevant parts of the higher education policy. This mailing list is a key tool in agreeing a common position on such questions of strategic interest. This suggests that the group of ITMs has formulated itself into an active community of practice (CoP). A community of practice can be defined as a group “*of people who share a concern, a set of*

¹⁰ <http://www.cao.ie/> for more information on how the CAO works.

problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an on-going basis” (Wenger et al., 2002, p. 4).

This is a group which originally started off organically, like most CoPs (Wenger et al., 2002), in the mid-1990s as the posts of ITMs were being introduced into the sector. The success of this group in promoting common best practice in the sector was recognised a few years later when more formal structures were put in place, which remain today. This group continues to engage in CoP activity as they pursue answers to the similar problems that are all faced with in the sector.

Thus by treating the ITMs as a CoP a more holistic version of a sector-wide ITM emerges and one which exhibits signs of effective knowledge sharing adding to local and national strategy making and policy. An inevitable consequence of such regular knowledge sharing is deeper network reflection and trust building (Mintzberg, 2004; Gausdal, 2008) which contributes positively to greater collaboration between participants (Bryson et al., 2006). This in itself is a step in identifying the contributory factors to ITM effectiveness in the sector. The other two factors identified as contributing to management effectiveness: people and their interpersonal relationships and that of managing the organisation, will be explored through the interviews with the local IT managers.

The concept of communities of practice has been differentiated in the literature from that of networks of practice (Van Baalen et al., 2005; Wenger, 2011), with the network of practice considered to be a more loosely bound grouping where members may never meet up with other members of the group. In Ireland there are two broad sections to the Higher Education (HE) landscape; the IoTI sector and the University sector. Both sectors use common application procedures and results from secondary education final examinations as entry points to their respective colleges. Research spans both sectors and other shared services such as broadband data services, software licensing agreements and a shared quality control framework are common to both. The two sectors while consisting of independent colleges come under the auspices of the Higher Education Authority (HEA) for policy guidelines and funding decisions. In such a scenario it is not surprising to find that IT management in both sectors will have common concerns and issues and indeed will meet up and visit each other to address common problems. This would qualify the combined HE IT management group as being a network of practice and while this qualitative study, which includes one-to-one interviews, is for practical reasons of completing the study in the given time restricted to the 13 Institutes that constitute the community of practice found in the IoTI sector, it is not difficult to see how the instrument could be used beyond this sector into the wider network of 7 Universities or more generally to further validate the assessment of ITM effectiveness. Such a study remains available for future work in this area.

Approach to data analysis

Once a case study approach has been chosen and qualitative data from the interviews with IT managers is to be analysed using the lenses of relativism and constructionism through which to view

the phenomenon, it then remains to be decided on how to analyse the data in sympathy with these philosophies. The interviews will be with the IT managers in their own work settings which affords the opportunity to treat each interview as a sub-unit of the larger case. This allows for independent analysis of sub-units of data but also allows for analysis between various sub-units or across all sub-units in the study which combined “*serves to better illuminate the case*” (Baxter and Jack, 2008, p. 550). However at some point the data must converge into a whole or bigger picture with each sub-unit acting as an individual piece in a puzzle. It is at this point that the researcher may become overwhelmed with the volumes of data from all of the interviews and require the assistance of a computer package to manage the data.

The data for this study have already been identified in the conceptual framework and from this and the underlying three literature sources an interview guide was developed which is used to group and to code the data for initial analysis. Any analysis made in the field, i.e. observations made or memos written will be added to the replies that were given to the structured interviews by the IT managers and form the basis for after the field analysis which is chiefly concerned with coding the data (Bryman and Burgess, 2002). There continues to be much debate as to the best way of analysing qualitative data (Miles and Huberman, 1994; Bryman and Burgess, 2002; Mason, 2002; Dey, 2003; Silverman, 2010; Bazeley and Jackson, 2013) with no clear-cut prescriptive strategy being preferred as is the case with quantitative data in a positivist study. Also, the acceptance of the use of computers in the qualitative data analysis process is the subject of much debate (Fielding, 2000; Gibbs *et al.*, 2002; Roberts and Wilson, 2002; Thompson, 2002; Welsh, 2002; Atherton and Elsmore, 2007). This contrasts sharply with the use of computers in the quantitative data analysis process where software packages used for statistical analysis are in widespread use. Since the 1980s commentators have been discussing the use of computers in qualitative data analysis (Conrad and Reinharz, 1984; Denzin and Lincoln, 2000), and in 1994, the Computer Assisted Qualitative Data Analysis (CAQDAS)¹¹ networking project was setup in the UK with the aim of allowing qualitative researchers share their experiences of using software in the qualitative analysis process without any ties to the corporate world and without the constraints presented by a formal publishing mechanism (Bazeley and Jackson, 2013). In spite of the length of time that the debate has continued for and in spite of the numbers of software packages available to the researcher, there is still no clear agreement on the use of computers in qualitative research. Opponents claim that from an epistemological point of view that the very nature of computers, based as they are on structured logic simply makes them unsuitable to the mind-set required for qualitative analysis, while others decry the removal of the researcher from the data when using some of the automated tools available (Roberts and Wilson, 2002).

In an attempt to bring some clarity to the argument, many researchers have distinguished between the purely mechanical acts of data management and the conceptual acts of data analysis (Fielding,

¹¹ <http://www.surrey.ac.uk/sociology/research/researchcentres/caqdas/> for more information on CAQDAS

2000; Gibbs *et al.*, 2002; Roberts and Wilson, 2002; Thompson, 2002; Welsh, 2002; Atherton and Elsmore, 2007) and suggest that it is acceptable to use computers for the data management tasks while urging caution in replacing humans in the more interpretive acts of reading text and generating coding schemes. Because of the way that this study is organised around the three pillar works which are the basis for the structured interviews, the initial coding schemes have already been pre-determined around these themes in advance of any data collection. This does not prohibit the generation of other codes once the data has been collected, rather it is the initial coding structure to be used as a starting point for the analysis. As the researcher is one of the IT managers in the sector and the study is into effective IT management, it is probably inevitable that there would therefore be a natural tendency to use computers to assist in the research wherever feasible. To this end the QSR NVivo¹² software package will be used for the more mechanical acts of data and ideas management, querying or searching the data and assistance with the visual representation of the results. The emphasis is on the use of the software to speed up and simplify the mechanical actions associated with the analysis process and not to, in some way, guarantee better analysis “*in the same way that good writing is not guaranteed by the use of a word processor*” (Gibbs *et al.*, 2002, p. 12).

Conclusion

As a researcher it is important to recognise how one’s own background can shape the interpretation of any research that one might be involved in and even how to approach research. Basic questions of confidence in the truth of the research and how to research are greatly influenced by a researchers own personal experiences and beliefs. The reality being investigated here is the world view of the IT managers about their individual effectiveness which is combined into a measure of IT manager effectiveness in the sector and compared with what it might be. From an ontological point of view it is a study in the relativist tradition which believes that the truth is found in peoples’ opinions rather than external factors. It is for this reason that the nature of the work is examined rather than the functions of it with the emphasis on: leadership qualities, connectedness with senior managers in the Institutes and appropriate measures to assess performance. As this is a study into the behaviour and actions of humans then, from an epistemological point of view, it is not a positivist study which would be more appropriate to the natural sciences. Rather it is a study in the social constructionist belief which holds that through social interaction people are capable of forming their own reality and the researcher immerses him/herself in that world to discover that reality. The degree of freedom that a person has to form their own reality rather than to follow orders in a mechanistic way is a position somewhere along a continuum between voluntarism and determinism and in this case it is neither one extreme nor another. This is unlike the decision between an ideographic or a nomothetic study because as the researcher is already immersed in the world to be studied and is

¹² http://www.qsrinternational.com/products_nvivo.aspx for more information on NVivo

mining into the wisdoms and interpretations of the subjects under investigation, it places the study solely into the ideographic tradition.

There is a lack of clarity in the literature between unit of analysis and case study with some commentators almost using one as a synonym of the other while others prefer instead to concentrate on what it is the research is trying to say something about as the unit of analysis and if that is a case or multiple cases or something else, then that is what the research should concentrate on. In this case the research is comparing the current state of IT management effectiveness in the IoTI sector with the ideal state that it might be, making the combined state of IT management effectiveness in the sector as the unit of analysis.

As the study concentrates on opinions of IT managers through interviews which generates a lot of qualitative data a decision had to be made as to how to approach the data analysis piece of the work, and in particular whether or not to use computer software to assist the process. The researcher is happy as an IT manager to use a computer for this but will discriminate between the mechanical aspects of handling and storing the data from the data analysis part of the process which it is considered still requires human intervention.

References

- Atherton, A. and Elsmore, P. (2007) 'Structuring qualitative enquiry in management and organization research: a dialogue on the merits of using software for qualitative data analysis', *Qualitative research in organizations and management: An International Journal*, Vol. 2, No. 1, pp. 62-77.
- Baxter, P. and Jack, S. (2008) 'Qualitative case study methodology: Study design and implementation for novice researchers', *The Qualitative Report*, Vol. 13, No. 4, pp. 544-559.
- Bazeley, P. and Jackson, K. (2013) *Qualitative data analysis with NVivo*, Sage Publications Limited.
- Benbasat, I., Goldstein, D. K. and Mead, M. (1987) 'The Case Research Strategy in Studies of Information Systems', *MIS Quarterly*, pp. 369 - 386.
- Benson, P. G., Saraph, J. V. and Schroeder, R. G. (1991) 'The effects of organizational context on quality management: an empirical investigation', *Management science*, pp. 1107-1124.
- Berger, P. and Luckmann, T. (1992) 'The social construction of reality', *NY-1966*.
- Blaikie, N. (2009) *Designing social research*, Polity.
- Broadbent, M. and Kitzis, E. (2004) *The new CIO leader: setting the agenda and delivering results*, Harvard Business Press.
- Bryman, A. (2004) *Social Research Methods*, Second Edition Edn. OUP Oxford.
- Bryman, A. and Burgess, B. (2002) *Analyzing qualitative data*, Routledge.
- Bryson, J. M., Crosby, B. C. and Stone, M. M. (2006) 'The Design and Implementation of Cross-Sector Collaborations: Propositions from the Literature', *Public Administration Review*, Vol. 66, No. s1, pp. 44-55.
- Burr, V. (1998) 'Overview: Realism, relativism, social constructionism and discourse', *Social constructionism, discourse and realism*, pp. 13-26.
- Burrell, G. and Morgan, G. (1979) 'Morgan. G. Sociological Paradigms and Organizational Analysis',
- Chan, A. (2001) *Critically constituting organization*, John Benjamins Publishing.
- Chia, R. C. and Chia, R. K. G. (1996) *Organizational analysis as deconstructive practice*, Walter de Gruyter.

- Collis, J. and Hussey, R. (2009) *Business research: A practical guide for undergraduate and postgraduate students*, Palgrave Macmillan.
- Conrad, P. and Reinharz, S. (1984) 'Computers and qualitative data: Editor's introductory essay', *Qualitative Sociology*, Vol. 7, No. 1, pp. 3-15.
- Cowburn, J. (2008) *Free will, predestination, and determinism*, Marquette University Press.
- Creswell, J. W. (1994) *Research design*, Sage publications Thousand Oaks, CA.
- Creswell, J. W. (2003) *Research design: Qualitative, quantitative, and mixed methods approaches*, Sage Publications, Incorporated.
- Crotty, M. (1998) *The foundations of social research: Meaning and perspective in the research process*, Sage.
- Cunliffe, A. L. (2003) 'Reflexive inquiry in organizational research: questions and possibilities', *Human Relations*, Vol. 56, No. 8, pp. 983-1003.
- Deetz, S. (1996) 'Crossroads—Describing Differences in Approaches to Organization Science: Rethinking Burrell and Morgan and Their Legacy', *Organization science*, Vol. 7, No. 2, pp. 191-207.
- Denzin, N. K. and Lincoln, Y. (2000) 'Qualitative Research', *Thousand Oaks ua*.
- Dey, I. (2003) *Qualitative data analysis: A user friendly guide for social scientists*, Routledge.
- Easterby-Smith, M., Thorpe, R., Jackson, P. and Lowe, A. (2008) *Management research*, SAGE Publications Limited.
- Fielding, N. (2000) *The shared fate of two innovations in qualitative methodology: The relationship of qualitative software and secondary analysis of archived qualitative data*.
- Gausdal, A. H. (2008) 'Developing regional communities of practice by network reflection: the case of the Norwegian electronics industry', *Entrepreneurship and Regional Development*, Vol. 20, No. 3, pp. 209-235.
- Gibbs, G. R., Friese, S. and Mangabeira, W. C. (2002) *The use of new technology in qualitative research. Introduction to Issue 3 (2) of FQS*.
- Gill, J. and Johnson, P. (2002) *Research methods for managers*, Sage Publications Limited.
- Goles, T. and Hirschheim, R. (2000) 'The paradigm is dead, the paradigm is dead... long live the paradigm: the legacy of Burrell and Morgan', *Omega*, Vol. 28, No. 3, pp. 249-268.
- Gomm, R., Hammersley, M. and Foster, P. (2000) *Case study method: Key texts, key issues*, Sage.

- Gosling, J. and Mintzberg, H. (2003) 'The five minds of a manager', *Harvard business review*, Vol. 81, No. 11, pp. 54-63.
- Greene, J. C. (2006) 'Toward a methodology of mixed methods social inquiry', *Research in the Schools*, Vol. 13, No. 1, pp. 93-98.
- Grünbaum, N. N. (2007) 'Identification of ambiguity in the case study research typology: what is a unit of analysis?', *Qualitative Market Research: an international journal*, Vol. 10, No. 1, pp. 78-97.
- Guba, E. G. and Lincoln, Y. S. (1989) *Fourth generation evaluation*, SAGE Publications, Incorporated.
- Guba, E. G. and Lincoln, Y. S. (1994) 'Competing paradigms in qualitative research', *Handbook of qualitative research*, Vol. 2, pp. 163-194.
- James, K. and Vinnicombe, S. (2002) 'Acknowledging the individual in the researcher', *Essential skills for management research*, pp. 84-98.
- Karami, A., Rowley, J. and Analoui, F. (2006) 'Research and knowledge building in management studies: An analysis of methodological preferences', *International Journal of Management*, Vol. 23, No. 1, pp. 43.
- Lane, D. C. (2001) 'Rerum cognoscere causas: Part I—How do the ideas of system dynamics relate to traditional social theories and the voluntarism/determinism debate?', *System Dynamics Review*, Vol. 17, No. 2, pp. 97-118.
- Lee, A. S. (1991) 'Integrating positivist and interpretive approaches to organizational research', *Organization science*, pp. 342-365.
- Lundberg, C. C. and Young, C. A. (2005) *Foundations for inquiry: Choices and trade-offs in the organizational sciences*, Stanford University Press.
- Mandell, M. and Steelman, T. (2003) 'Understanding what can be accomplished through interorganizational innovations The importance of typologies, context and management strategies', *Public Management Review*, Vol. 5, No. 2, pp. 197-224.
- Mason, J. (2002) *Qualitative researching*, Sage.
- Meredith, J. (1998) 'Building operations management theory through case and field research', *Journal of Operations Management*, Vol. 16, pp. 441-454.
- Miles, M. B. and Huberman, A. M. (1994) *Qualitative data analysis: An expanded sourcebook*, SAGE publications, Inc.

- Mills, J., Bonner, A. and Francis, K. (2008) 'The development of constructivist grounded theory', *International journal of qualitative methods*, Vol. 5, No. 1, pp. 25-35.
- Mintzberg, H. (2004) *Managers, not MBAs: A hard look at the soft practice of managing and management development*, Berrett-Koehler Publishers.
- Mintzberg, H. and Gosling, J. (2002) 'Educating managers beyond borders', *Academy of Management Learning & Education*, Vol. 1, No. 1, pp. 64-76.
- Mitra, S., Sambamurthy, V. and Westerman, G. (2011) 'Measuring IT Performance and Communicating Value', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 47-59.
- Nola, R. (1988) *Relativism and realism in science*, Springer.
- O'Toole, L. J. and Meier, K. J. (1999) 'Modeling the impact of public management: Implications of structural context', *Journal of Public Administration Research and Theory*, Vol. 9, No. 4, pp. 505-526.
- Patton, M. Q. (2002) *Qualitative Research & Evaluation Methods, 3rd Edition*, Sage Publications.
- Peppard, J., Edwards, C. and Lambert, R. (2011) 'Clarifying the Ambiguous Role of the CIO', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 31-44.
- Roberts, K. A. and Wilson, R. W. (2002) *ICT and the research process: Issues around the compatibility of technology with qualitative data analysis*.
- Shaw, E. (1999) 'A guide to the qualitative research process: evidence from a small firm study', *Qualitative Market Research: an international journal*, Vol. 2, No. 2, pp. 59-70.
- Silverman, D. (2010) *Qualitative Research*, Sage.
- Stake, R. E. (1978) 'The case study method in social inquiry', *Educational researcher*, pp. 5-8.
- Thompson, R. (2002) *Reporting the results of computer-assisted analysis of qualitative research data*.
- Welsh, E. (2002) *Dealing with data: Using NVivo in the qualitative data analysis process*.
- Wenger, E., McDermott, R. and Snyder, W. M. (2002) 'Seven principles for cultivating communities of practice', *Cultivating Communities of Practice: A Guide to Managing Knowledge*.
- Yin, R. K. (1981) 'The case study crisis: Some answers', *Administrative Science Quarterly*, Vol. 26, No. 1, pp. 58-65.
- Yin, R. K. (1994) *Case Study Research*, Beverly Hills, CA: Sage.

Zimmermann, N. (2011) *Dynamics of drivers of organizational change*, Springer.

Zuriff, G. (1998) 'Against metaphysical social constructionism in psychology', *Behavior and Philosophy*, Vol. 26, No. 1/2, pp. 5-28.

Paper 4: Findings

Abstract

Since the wide scale adoption of computers into all facets of business in the late eighties the spread of ICT has been relentless. The person charged with ensuring the efficient running of ICT in the Institute of Technology sector in Ireland is the IT Manager (ITM). This study concentrates on the effectiveness of IT management in the sector by identifying from the literature the contributory factors to good IT management and comparing these factors with the practice of ITMs in the sector. The findings indicate a sector which is conservative in its approach to the introduction of new technologies and where the demands placed on the ITMs in the sector and the expectations of the role leave room for improvement if ITMs are to operate at optimum levels of effectiveness. All IT Managers, currently working in an Institute of Technology, were contacted to answer surveys based on ITM leadership. This was followed up with face-to-face interviews with all ITMs at their own workplaces to discuss various aspects of IT management including the scope of the role of an ITM, challenges faced, issues critical to success and most appropriate key performance indicators (KPIs) to measure the effectiveness of the ITMs within each organisation. The aim of the study is to measure the current effectiveness of IT management in the sector and to propose a general instrument to determine IT management effectiveness.

Keywords: IT Management effectiveness, leadership and measurement.

Introduction

The study is about the effectiveness of IT Managers in the Institutes of Technology (IoT) sector in Ireland. The principal goal is to measure the effectiveness of the contribution that IT Managers in the sector make to the running of the Institutes against the findings of IT management effectiveness found in the literature and to suggest methods to underpin the effectiveness of IT management in the Institutes. Three seminal works were chosen from the literature dealing with; “*Clarifying the Ambiguous Role of the CIO*” (Peppard *et al.*, 2011), “*The New CIO Leader*” (Broadbent and Kitzis, 2004) and “*Measuring IT Performance and Communicating Value*” (Mitra *et al.*, 2011), which are combined to evaluate the current condition of IT Manager effectiveness in the Institute of Technology (IoT) sector in Ireland. From the previous papers the conceptual model in Appendix A was constructed to describe the goal of the study and relationships with the underlying literature.

Extant online surveys and interview questions were combined to produce a survey instrument based on this model which was then used to gather the data for the study. There are currently 13 IoTs (Appendix B) in Ireland and as the researcher is employed as an IT Manager (ITM) in one of these the maximum number of other ITMs in the sector to interview is 12. However to capture all 13 Institutes the author’s home Institute statistical figures are included. Also, the online survey results of the author are included in this section for the same reason. All 12 ITMs were contacted and all agreed to participate and to be interviewed. All spoke openly about their experiences in the sector on the strict understanding that their comments or experiences would not be attributed back to them personally or to their Institutes.

Data collection was divided into two parts; the first part was to get all ITMs to take the online leadership assessment¹³ which accompanied “*The New CIO Leader*” (Broadbent and Kitzis, 2004) and the second part was the face-to-face interviews with each ITM in their own Institutes. Readers of “*The New CIO Leader*” are encouraged to take the online leadership survey (Appendix C) to assess their own CIO effectiveness through the lens of leadership and compare it with industry norms. The objective of the exercise is that readers (working CIOs/ITMs) can compare themselves with other CIOs/ITMs in the industry at the beginning of the book and return after reading it to self asses again with the expectant improvement in effectiveness. All ITMs in the sector completed this 20-30 minute assessment and all had posted the results back to the researcher prior to the interviews.

The interviews were conducted between June and September of 2013 and were recorded. To ensure that the data related back to the original reference material the interview questions were structured around the remaining Peppard *et al.*, (2011) and Mitra *et al.*, (2011) studies and along with one open ended question on the opinions of each of the ITMs to the online survey combined to produce an interview guide (Appendix D) divided into nine sections; scope of the role, issues critical to success, performance metrics, challenges, relationship with senior

¹³ Survey available at: http://www.gartner.com/5_about/news/gartner_press/NewCIO3.jsp

management, assessment of maturity of IT, online survey opinion, value metrics and communicating value. The resultant transcripts were later coded using QSR NVIVO 9 to facilitate management and retrieval of data. Coding proceeded along the lines of the individual 45 questions and 9 sections. Coding was added to manually as appropriate based on the interview responses and the experience of the researcher. The aggregated findings for each of the questions and the online surveys were presented back to the group at a regular ITM meeting for comment and approval where indeed they were approved as being accurate.

In this paper the results of the online survey are presented first with comparisons to international peer scores. The findings of the interviews are then presented in keeping with the 9 sections of the interview guide. The interviews are analysed to discover the level of IT management that the sector is functioning at as outlined in the underlying studies. Combining this level of IT management with the results of the comparisons with peers as indicated through the online surveys, suggestions for possible areas of improvement are presented to maximise ITM effectiveness in the sector.

Findings

Online Survey

Each of the ITMs were given a link to the survey and asked to complete it in advance of the interview. As all three of the reference works used to develop the conceptual model were all dealing with the topic of CIO or ITM effectiveness some of the themes dealt with in each of the works overlap slightly. For example Broadbent and Kitzis (2004), on which the online survey is based, devote their work to CIO leadership under headings which include inter alia; understanding the environment, creating vision, creating governance and weaving business and IT strategies together while Peppard *et al.*, (2011) discuss effective IT management with reference to importance of business knowledge versus importance of technical knowledge, identifying new technology and preparing the business for new technology, gaining active governance of IT and ensuring continued investment in strategic opportunities. Peppard *et al.*, (2011) further discuss performance metrics and possible mismatches with service expectations while Mitra *et al.*, (2011) discuss measuring IT performance and communicating value. This overlap is not seen as unnecessary duplication; rather it is seen as triangulating the findings by taking different approaches to the same core subject.

When agreement was being sought from the group of IT Managers to participate in the study it was considered prudent to issue the link to the online survey in advance of the interviews as the most common question being raised at that stage was enquiring into what sorts of topics would be covered in the interviews. By issuing the online survey in advance and informing the participants that similar topics would be covered in the interviews, all ITMs were familiar with the purpose of the interview and happy to proceed.

The Broadbent and Kitzis (2004) work describes the top ten priorities that these authors have found for the effective new CIO leader. They are divided into two sides; a demand side which is concerned with the ability of the CIO to lead “*as peers, colleagues and even subordinates*” (Broadbent and Kitzis, 2004, p. 32) and requires a talent for leadership by persuasion. It focuses on the needs of the enterprise and the ways IT can enable the enterprise to achieve its strategic goals and fulfil its persistent business needs. The other side is the supply side, where the CIO depends more on the formal authority that comes with the position which can vary from one organisation to another and “*often counts for less than theory says it should*” (Broadbent and Kitzis, 2004, p. 32). This is about delivering on the promises that have been made on the demand side. The results of the online survey indicate where the IT management in the IoTI sector lie on both the demand side and the supply side of CIO leadership. Figure 10 shows that while scores vary over the ten categories, the two graphs are not too dissimilar with the IoTI ITMs scoring better in some categories and poorer in others. However as the IoTI score is based on the survey results of a group of ITMs all working in the same sector which is governed by the same legislative and funding frameworks, and the peer scores come from a wider group of ITMs, it is not surprising that there would be greater polarisation evident in the IoTI scores than in the peer scores. Overall the percentage difference between the IoTI ITMs and peers was +0.28% which is the result of thirteen ITMs taking a survey with ten categories and a total of 84 questions. The findings of the interviews are used to confirm these results and to form the basis for the ensuing discussion.

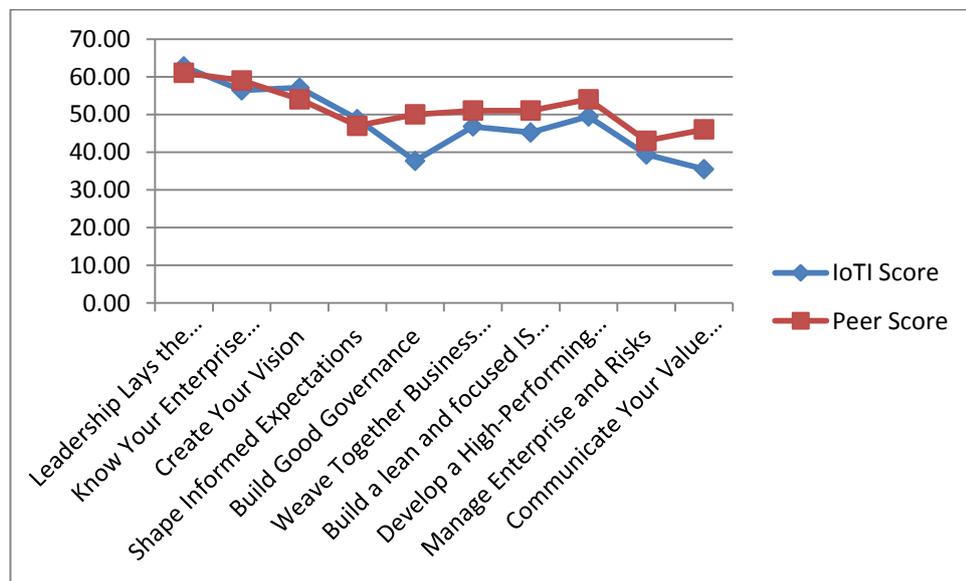


Figure 10: Comparison of IoTI IT Management with Peer Score

1. Leadership Lays the Foundation

The IoTI sector scored 1.69% better than peers who also took the survey. This section enquired into the ability of participants to change and to influence others. To be effective ITMs require vision, inspiration and passion to lead. This is distinct to the attributes required to manage effectively which depends on management skills of planning, organising, control and analysis.

2. Know Your Enterprise Fundamentals

The ITMs in the sector did not score as highly as peer ITMs; a difference of -2.62%. In the “*New CIO Leader*”, the chapter dealing with this section talks of being familiar with the planning and economic cycles of the business and understanding key financial and other metrics used by other business colleagues in the industry. Building relationships with key internal and external stakeholders is of importance here. The lower score could point to a lack of key financial metrics tied into the economic cycle of the business of the Institutes. The focus in third level colleges tends to centre on the academic cycle rather than on economic ones.

3. Create Your Vision

The IoTI sector ITMs scored 3.08% better than peers. This section attempts to establish the capacity of the participant in their current role to look ahead of business colleagues for opportunities to use technology for business benefit. It talks about leading and coaching colleagues to adopt or change current business processes through technology to unlock potential business uses. On this score, the IoTI sector would appear to be well served by the current ITMs.

4. Shape Informed Expectations

This is another section where the IoTI ITMs fared better than peers; 1.77% better. To excel in this area requires a CIO to work with senior executive colleagues to align key business needs and strategies with IT creating a shared and informed view of the expectations of the CIO. A strong picture emerges of IT Managers operating at middle management level who are at ease with senior executives in their Institutes and who are treated as trusted partners to provide technology solutions to the sector. There were however some exceptions to this where nationally established solutions were imposed on the sector without consultation with ITMs.

5. Build Good Governance

This is the section where the sector ITMs had the poorest score compared with peers; -12.31%. This section speaks as much about the overall organisation structure as it does about individual ITMs as it deals with the benefits to the organisation of robust processes and appropriate involvement across the organisation in major decision making in IT investment and use. It talks of a balance of decision rights of multiple constituencies amongst various sections of management and using formal mechanisms such as executive committees and informal mechanisms such as collaborating with colleagues. To build good governance requires an environment in which its importance is recognised. The imposition of national solutions on the sector, the lack of an IT voice at senior levels and the digital literacy of the SMT are all areas which can conspire to inhibit good IT governance in the sector.

6. Weave Together Business and IT Strategies

This section scored -4.23% in comparison with peers. It deals with defining a targeted set of objectives, initiatives and investments for a specified period. However as it depends on a good governance structure to indicate just who gets to decide on major areas of IT activity, the negative result is consistent with the poor showing in the previous governance section. This

section explores the existence of an enterprise wide system to adopting a portfolio approach to IT investment.

7. Build a Lean and Focused IS Organization

This was rated as -5.77% compared with peers. Success in this section depends on the authority of the ITM to organise people, operations and technology around end-to-end workflows rather than around functions, platforms or skill sets. It also discusses the need for appropriate outsourcing of day-to-day IT tasks to free up staff to focus on more value-added activities for the organisation. Once again the position of the ITM in the organisation and the latitude that they are afforded to reorganise end-to-end workflows across the Institutes impacts on the ITMs' ability to deliver in this category.

8. Develop a High-Performing Team

Comparison here was -4.54% against peers. This section talks about strategies such as making HR a valued business partner to help with reorganising centres of excellence and investing in training and recruitment and closing competency gaps. Some of this might be beyond the current ITMs working in the current environment but there may be other actions that ITMs might take such as working on soft skills to improve emotional intelligence and deploying different leadership styles where appropriate. Difficulties emerged with ITMs trying to coax reluctant departments to improve processes to deliver greater efficiencies as barriers to success in this area. Also there is very little change of personnel in Computer Services Departments in the Institutes; it is not uncommon to have departments staffed by personnel all of whom are into double digits in years of service to the Institutes. Coupled with the national employment control framework, mentioned by several ITMs as a challenge, means that recruitment into Computer Service Departments is next to impossible.

9. Manage Enterprise and Risks

This section was -3.62% against peers and more mention of governance. This time risk governance policies and processes are the focus of attention. Again the ITM cannot manage these risks alone; *"Too many causes and consequences are outside the control of the IS organization"* (Broadbent and Kitzis, 2004, p. 225). However this does not absolve the ITM from being proactive in taking the lead in these areas. By raising awareness of risks to the Institutes due to risks identified by the ITMs, there is potential to increase the level at which the ITM operates to take on a more strategic role in managing risk.

10. Communicate Your Value and Performance

The final section was -10.54% below peers. In the text, this section refers to building links between IT and shareholder value, but as all the Institutes in the sector rely almost exclusively on government funding and none of the Institutes has any shareholders, it might just mean that this section of the survey was not as relevant to the sector as it might otherwise have been.

All the findings with a positive comparison with peers; leadership, creating vision and shaping informed expectations are on the demand side of the model as described in the literature with

three of the indicators on this side being negative; understanding the environment, creating clear IT governance and weaving business and IT strategy together. However all indicators on the supply side of the model: building a lean and focused IS organisation, developing high-performing teams, managing enterprise and risks and communicating value and performance are all negative in comparison with peers. Support for what might account for these findings was sought out during the face-to-face interviews. Possible causes for this are that the demand side is characterised by activities where the ITMs are responding to the requirements of the Institutes and are thus measured by these while the supply side is characterised by activities associated more with the formal authority of the role. If the authority invested in the role by the Institutes is not sufficient, then this might explain the poor showing on the supply side.

Interview Findings

The Peppard *et al.*, (2011) study describes a journey that organisations take from requiring their ITM/CIO to play a supporting role to one where he/she becomes a driver of competitive advantage etc. the conclusion being that the more advanced along the journey the organisation and CIO are the more effective the CIO is and the more value that the organisation is getting from IT. From their studies, they have identified five distinct types of CIO: Utility IT Director, Evangelist CIO, Innovator CIO, Facilitator CIO, and Agility IT Director/CIO. The labels for the roles indicate the type of mission expected of the role (Appendix E) and for each role an appropriate set of leadership skills is required (Appendix F). In addition to identifying the five distinct CIO roles within an organisation Peppard *et al.*, (2011) suggested “*that the appropriate CIO role for an organization is determined by two criteria:*

- The chosen strategy of the organization and, in particular, the role that information and technology play in any competitive differentiation.
- The level of information capability within the organization” (Peppard *et al.*, 2011, pp. 37-38).

The five types of CIO are characterised by the following five traits which form the first five sections of the interview:

1. *Scope of the role*
2. *Those issues cited as critical to success*
3. *The performance metrics* used for assessment
4. *The challenges* cited
5. *The nature of the relationship* with CxO colleagues, in particular the CEO

Also “*the appropriate role for a particular organization at a point in time is determined by the criticality of information and technology for competitive differentiation and the maturity of its information leadership capabilities. Both are strongly influenced by the digital literacy of the CxO team*” (Peppard *et al.*, 2011, p. 31). To capture this point a sixth section was added to the interview guide to get the assessment of the ITMs of the criticality of information to the organisation and the digital literacy of the senior management team in each IoT. The seventh section was ITM opinion of the online survey.

The final two sections of the interview were based on “*Measuring IT Performance and Communicating Value*” (Mitra *et al.*, 2011). In this study a portfolio of metrics was developed across three distinct areas; operations, projects and innovation and measured against specific metrics which varied from IT specific metrics to business specific measures (Appendix G). Just as with the Peppard *et al.*, (2011) study where the role that the ITM/CIO plays in the organisation is dependent on many dimensions, with Mitra *et al.*, (2011) there is a similar set of measures to determine the focus of the ITM and by so doing will indicate the role that the organisation expects the ITM to play in the business. These are indicated by a combination of metrics from the portfolio and may change from one organisation to another and change over time. The five specific focus domains are:

- *Internal IT Focus:* The CIO’s focus is on IT-specific outcomes.
- *Project Focus:* The CIO’s focus is on effective delivery of projects and their business benefits.
- *Business Operations Focus:* The CIO’s focus is on reliability and efficiency of current business operations.
- *Business Process Focus:* The CIO’s focus is on improving performance, either at the process or the overall business level.
- *Innovation Focus:* The CIO’s focus is on the enablement of business innovation.

Relevant quotes to illustrate various points can be found in Appendix H .

Scope of the Role

This places the ITM in the organisational chart, enquiring into past and projected evolution of the role and the extent to which the Institutes utilised the ITMs’ business or technical knowledge. Of the 13 ITMs in the sector none of them are on the senior management team: six reported to the Registrar (the most senior academic in the Institutes), five reported to the Secretary/Financial Controller, one reported to the Head of Development and one reported directly to the President. This direct report to the President was a recent development and was considered to be temporary in nature. This places all ITMs in the sector at the middle management layer in the organisation. Length of time in the post varied from four months to the longest serving ITM in the sector at 18 years. When averaged out, this gave a value of nine years and six months service.

The ITMs in the post for only a few months had not seen any change in the role but people who were more established had seen great changes. The role had expanded to include more activity, it had grown along with the size of the Institute and the size of the Computer Services Department and also that the role had changed due to changes in technology over the years; even new ITMs in the sector but who had been working in IT for some years reported this. On future evolution of the role, some of the comments continued to be technology based e.g. moving more services to the cloud and virtual desktop deployment, however there was also a much stronger emphasis on becoming more strategic and greater use of Institute information. It is identified in the literature that coordinating organisational information and technology requirements is a sign of having reached Agility IT Director/CIO.

Another key indicator in assessing the current position along the road to Agility CIO is whether the ITMs' business knowledge was valued more than their technical ability. The findings show a range of answers from complete emphasis on technical knowledge only (50%) to recognition that management experience and political shrewdness were as important as business and technical knowledge were to be effective. However it was possible to detect a growing awareness of the need to be more involved in the business end of the Institute and also an acceptance that this shift had already happened. Also it was recognised that there is no one "Institute" position on what is required from an ITM but that as one person said "it depends on the individuals" indicating that some senior managers value the ITM input into business matters while others would prefer to restrict all interactions with ITMs to technical matters. This is to be expected as no two Institutes are identical; there are various sizes ranging from the smallest at 2,143 undergraduate students in 2012/13 to 7,327 in the largest¹⁴. There are also differences in the demographic makeup of the student base, course offerings, competition for students in a given locality etc. which will shape the expectations and demands that each Institute will place on their ITM. However this study is concerned with getting a view of the national position of the effectiveness of IT management in the sector rather than prescribing individual courses of action for each Institute in the state.

The ITMs can be seen as a trusted partner with a good global view of the business of the Institute but operating in an environment that is not always open to change or where individuals in the Institutes prefer to develop IT solutions themselves without reference to any IT Department or Institute standards. However the view of the ITM as a chief technician and nothing else can still be found in a small minority of cases. This could be due to the range of factors previously mentioned but it may also take into account the range in length of service across the sector with the newer ITMs not having established themselves just yet. There emerged also a divide between ITM interactions with functional areas and senior management in the Institutes and the synergy with academic departments. Culture was often mentioned as a reason why there might be a divide between ITMs and long established academic departments. Many academic departments were around long before computers or IT Managers were and had long established ways of doing business where computers might not be the first tool of choice for colleagues in these areas. In this type of environment ITMs expressed frustration at the conservative nature of faculty which might be very resistant to change. It was okay for Computer Services Departments to maintain a serviceable infrastructure but there was a sense of ITMs being unwelcome when it came to making changes or even suggestions about change when it came to the business end of academic departments.

In spite of some of these reservations about the desire of the Institutes for the ITMs to operate at a more strategic or business focused level, the interview responses indicated a strong dependence on the ability of the ITM to get things right. All major IT purchases are directed towards the IT Departments. Senior management appear happy to engage with ITMs for

¹⁴ Source: <http://www.heai.ie/en/statistics/2012-13>

analysis of larger projects and very often follow this up with funding for ITM proposed projects. Vendor management is also rated as important and ITMs are expected to manage and get best value from third parties.

On the road to achieving Agility CIO there is strong reinforcement of the trust that each Institute places in the skill of the local ITM to deliver and in the priority given to supporting agile student services, but in this case a picture emerges of a fully agile infrastructure being beyond the current thinking in the sector or even unachievable with ITMs wishing to contribute more in this area being hindered; human and financial resources, were quoted as limiting factors. There is also a sense of some Institutes requiring support for niche services rather than an agile infrastructure in line with the differing Institute profiles already mentioned.

On the topic of contribution to strategy formulation the responses all indicated some form of involvement by IT; either as a lone operator informally developing IT strategy in isolation to the rest of the Institute to ITMs who are involved extensively in formal structures in the Institute for strategy development. However where ITMs are formally involved it was not always as a result of internal planning or being invited to get involved, rather, it was as a result of pushing themselves forward into the process. This could be seen as ITMs wishing to travel along the journey to Agility CIO themselves independent of the needs of the Institutes to see the ITMs satisfying that role.

Issues Critical to Success

The issues identified by the ITMs as being critical to success as they saw it when compared with how these issues inform senior management and strategy of the Institutes are important in identifying which role the ITM is fulfilling. Great emphasis was placed amongst the respondents to the priority of service provision to the organisation. The importance that each organisation places on a stable and reliable IT environment was emphasised by all with some ITMs contrasting the current low tolerance levels to any form of disruption to IT services, even during what would be considered outside normal working hours, with the very limited impact disrupted services would have caused some years ago. Some ITMs replied that once IT services were maintained that they had no greater role to play while others expanded to include more non-technical roles such as team management and leadership functions, legal responsibilities to keeping the Institute licensed correctly for software and greater involvement in information management.

In spite of there being no ITM on the SMT all were happy to attend senior management meetings to discuss IT issues and to get feedback and all are invited in at some point. Some Institutes have more formal structures in place for ITMs and other middle managers to meet with the senior team which varies from once every quarter to once every two weeks. Some ITMs were happy to limit senior management interaction to invited sessions while others had aspirations to being a member of the senior management team in their own right. It was also felt

that it was useful too, to get the minutes of the senior management meetings in order to keep informed of issues being raised there.

These executive meetings can be seen as a tool used by the ITM in preparing the Institute for new technologies. The implication from the literature is that the more it is reported that this is part of the job then the more along the journey to Agility CIO the person is acting. This is an indication that the ITM is seen as more than a super technician but also a leader in the organisation who is trusted to lead in the selection and adoption of new technologies. The converse of this is that the more the ITM is considered to be the person to keep existing technologies working and not the person the organisation depends on for leadership in this field, then the ITM is acting more as a Utility IT Director. The vast majority of ITMs consider this to be very important or critical to what they do. However there was some dissent from this view where it was considered that existing Institute structures were preventing this from happening. There was an acceptance that there is a steady stream of new technologies emerging every day and that it would be impossible to introduce it all into any organisation. Thus a consensus emerged of a desire to keep up to date, but an informed caution was expressed when making changes. Stable infrastructure was seen as more important than just introducing new technology for the sake of having new technology.

The importance of maintaining service levels was mentioned in each of the three works on which this study is based; service, provision of service, maintenance of service, service levels etc. are all mentioned. There was broad general agreement that IT departments in the Institutes were there to deliver a service but opinion differed on the importance of maintaining service levels; some felt that it was critical to everything that their departments did. It was also mentioned that service standards or service level objectives might be more appropriate as if formal service level agreements were made without resources to maintain or expand them there was little point in having formal agreements.

Performance Metrics

This section continues with the traits identified by Peppard *et al.*, (2011) which differentiate between the different types of ITM. A view is elicited on the ITM indicators of success, then on what the senior management might consider to be important, this is followed by how IT innovation might be measured, how important return on investment (ROI) is and finally for this section whether or not user satisfaction is important to the ITMs.

On the topic of what items the ITMs would include as important indicators of success, maintaining a service and lack of complaints from either end users or SMT were the common themes to emerge. However it was identified that there are no formal metrics used to measure performance in this area which ties in with earlier comments where it was found that the importance of maintaining service levels was agreed to be core to the job but was not backed up by any formal service level agreements (SLA).

From a senior management point of view, the ITMs considered success to be the ability to keep the IT service going without issues being raised to the SMT. There was a sense that senior management did not have any desire to hear about IT but this was clarified by some who added that the SMT were happy when IT problems were not on the agenda but they did expect to be kept informed by the ITM of technical developments that may be useful to the Institutes in the future. There was an understanding that the SMT understood the importance of the provision of a well maintained IT infrastructure to the students and the negative impact that a poorly maintained IT service would have.

It appears then that there is universal agreement on the importance that both ITMs and SMTs place on the provision of stable IT infrastructure in the Institute. However service availability appears across the range of ITM roles identified in the literature so this on its own does not indicate what level the ITM is operating at. To help gauge whether the ITMs are operating above the basic Utility IT Director an indication of how the ITMs would measure the success of any innovation or project that they were involved in was queried. A common theme to emerge was delivering projects as planned on time and on budget. However this was almost taken for granted and not mentioned as an exceptional achievement. There emerged various stages of success of a project; the first one was engagement, just getting people to engage with an innovative idea to begin with was seen as an indicator of future success of a project. The second stage in success of a project was adoption of a solution that would have resulted from a project; there was little point in introducing world class technologies if nobody was going to use them. It was also pointed out that from implementation to adoption could take a few years as IT Departments quite often had to conduct proof of concept and pilot projects before implementing a technology but even then some end users might take time to be convinced of the merits of the project. The third stage of success was the impact that the project had on the end users; were there greater efficiencies as a result or had former areas of complaint been removed?

Success might also have been measured by return on investment (ROI) indicators and indeed the cost of technology and the necessity to spend wisely was of paramount importance for all ITMs. Apart from the Estates Offices, which are charged with maintaining buildings and paying utility bills, the IT departments in the Institutes are regularly the second highest spending departments in the organisation. For this reason ITMs would be very aware of the role that they have to play in keeping Institutes within budgets. However there was agreement that ROI in an academic environment was not an easy thing to measure. There is no general profit and loss account in any of the Institutes that can be affected nor is there any shareholding value that might help to identify a positive or negative swing in response to IT investment. One example of where it was measured was when one ITM was proposing a change to the methods used to cool the server room, the savings in utility bills for running the server room were calculated and it was shown that there would be a return on investment after a period of two years. This was however the exception with most ITMs reporting that it is not as clear cut when it comes to introducing something like an online virtual learning environment.

Performance metrics might also have been discussed in terms of end user satisfaction and without exception all ITMs said that it was either very important, key to what they do, critical or some such phrase to indicate that it was of paramount importance. There were some caveats inserted in the conversation however; user satisfaction is something that needed to be managed properly to avoid service expectations getting out of line with ability to deliver. Also the time gap for users to adopt a new technology and to become satisfied with it was mentioned as a difficulty in adopting end user satisfaction metrics as a measure of IT performance.

Challenges

In the literature the challenges faced by the CIO were seen as another indicator of the level at which the person in the role was operating at. This section concentrates on the challenges faced by ITMs by asking them to simply list them first of all and then enquiring into specific ones mentioned by Peppard *et al.*, (2011).

The first question asked was an open one to the ITM to discuss what they saw as the most serious challenges they faced. There was a wide variety of views expressed, but there was none the less consistency amongst the replies. All but one mentioned resources as a challenge, either financial or human resources and all but the one where finance was not a problem or an expected problem did not mention technology as a challenge or specifically mentioned that technology was not a challenge at all. The one where finance was not an issue did express the complex nature of technology as being the number one challenge; this may be due to the lack of budget constraints that all the others mentioned which may have limited the choices available to the rest but where finances were not a limiting factor the range of options available expanded to such an extent as to increase the complexity of the selection process.

A picture emerges of the sector as a largely conservative one that is resistant to change. This poses a problem for ITMs who are trying to introduce new technologies where all but a very few early adopters are quite happy to continue using whatever technology they have always used. This conservative approach is reported from the senior management team (SMT) right through the academic community in the Institutes to the extent that it defines the culture within which the ITMs are operating. There was much mention of lack of SMT buy in and lack of academic support or people taking ownership of solutions once they had been delivered. Even solutions to problems that were developed specifically for one area in the Institute were subsequently reported as then becoming the responsibility of the IT Department and not transferring to the requesting department. Another aspect of resistance to change was the numbers of people who encountered individuals or lecturers wishing to develop their own small scale solutions to problems without reference to, or even at variance with, centrally developed and supported solutions or policies. This suggests that the ITMs are required to operate somewhere between the Innovator CIO level and the Facilitator CIO or even the Utility IT Director who has to stop users' DIY IT.

In describing the difficulties of dealing with these challenges and the expectations of the role a very mixed picture emerges with some saying that they have no problems as the expectations of the role are not all that high to begin with while others expressing the view that people can expect too much from the ITMs and their departments and that expectations need to be tightly managed. This is especially so when delivering projects; the expected outcomes of the projects need to be clarified very early in the process to avoid expectations that are undeliverable. The financial and human resources constraints were mentioned as limiting factors in delivering on expectations as was the constantly changing technology horizon which required resources and fresh skills to implement. However the constant change and development of new technologies may be a challenge but it could also be what makes the job enjoyable for some.

There was a 50/50 split amongst the group as to whether or not their understanding of the business of the Institutes posed a challenge to them. As might be expected newer people into the post were still learning the ropes to a degree but reported that the management of IT was remarkably similar in education as it had been for them in previous employments outside the education sector. Of those who said that it was a problem, there was more an emphasis on difficulties experienced in trying to match technology deployment with business requirements because they may not have been included in business decisions due to not being at senior management level. Others who reported problems with understanding the business attributed it to the current state of change in the higher education sector in Ireland; there are several different groups of Institutes in merger talks and others in talks on increasing collaboration between Institutes to satisfy government policy. When these talks are complete, IT Departments along with many other departments like HR and Finance, in each Institute will have to adapt or change systems to match the requirement of the newly formed entities. There was also a sentiment expressed that individual IT Managers might be able to help themselves somewhat by getting involved more in the business end of things and shifting their focus from purely technical matters.

However there were also other barriers described to understanding the business of the Institutes as four of the ITMs expressed a difficulty in getting sufficient time with senior management to achieve this. The difficulty was not on a personal level; there were no problems reported with interpersonal relationships rather the difficulties were expressed in terms of not being part of the senior management team when decisions were being made. There was a continued sense of isolation from major decisions being made in the Institutes.

Coupled with the sense of exclusion that ITMs were feeling were the views of governance where once again there was a 50/50 split. The ITMs who said that it was not an issue did not support this with any evidence of governance structures; they simply felt that it was not an issue for them. The common theme amongst the 50% who said that there were difficulties with governance was once again the ITM position in the overall organisation chart. There were reports of people who were trying to work on better governance but referred to constraints imposed at national level to use third party suppliers for certain systems as a hindrance to better

governance. This led to an acceptance of there being some things in the control of the Institutes to change in pursuit of better governance and some things which could not be changed.

This weakness in governance also emerged when discussing the environment in which the ITMs are charged with maintaining central services for the organisation and where individuals within that organisation might wish to experiment with different technologies that will not scale up to a solution that is possible to implement across the Institute. A difficulty arises in trying to reconcile the differences between the ITM view of systems, which of necessity has to have regard to Institute wide requirements which includes good governance, with the views of individuals who may not have as much insight, knowledge or interest in maintaining enterprise level systems. However the challenges posed by intelligent users who operated at a level of awareness compatible with maintaining enterprise level systems, were welcomed and enjoyed.

The issues associated with governance could also be found in discussing the process of setting technical standards where the majority of ITMs reported having some difficulties at some point. The problems centred on the culture of a set of organisations that values academic freedom and research and also encourages entrepreneurial endeavour. These were seen as possible sources of tension when setting standards and policies. The other source of friction in this area mentioned was the need to agree policies with unions who might see them as impinging on members' working conditions and freedoms. The third source of difficulty cited was the constantly changing environment in which the policies and standards are being written.

Relationship with Senior Management

In the literature there is a category listed under traits that deals with "Relationship with CxOs" and even though the challenge of getting face time with senior managers has already been explored the relationship with the SMT is examined here. When referring to the appropriate ITM role for a particular organisation at a given point in time it is stated that the maturity of the information leadership capabilities of the organisation which is strongly influenced by the digital literacy of the senior management team has a major role to play in determining the expected ITM role (Peppard *et al.*, 2011). When asked, all ITMs in the sector said that it was either important or very important for ITMs to have a good working relationship with members of the SMT and to have regular interactions with them. Some of the ITMs went further to say that it is as important if not more important to manage up to the SMT as it is to manage down to technical staff about operational issues.

However there was a certain sense of frustration surrounding interactions with the SMT as the role of the ITM in the Institutes would not be universally considered to be important amongst all the members of the SMTs. Executive members who do not deal directly with academic schools or departments, i.e. those who manage more central functions, might be inclined to value the work and opinions of the ITMs more than those on the SMT who did work directly with their own schools or departments. There was a view that the ITMs might be seen as an inhibitor to progress by these senior managers due to their insistence on retaining common standards

across the Institutes whereas these managers might be coming under pressure from academic staff in their areas who wish to develop small scale alternatives to Institute systems. The general view to emerge was one of ITMs being considered as something of a super technician or something between a technician and a member of the SMT. Nobody felt that they were treated as an equal with members of the SMT.

If some members of the SMTs in the Institutes are inclined to pass over ITMs this does pose a problem in the Institutes for how the ICT agenda is set. According to the roles identified in the literature, the more involvement the ITM has in setting the ICT agenda, the higher up the five roles that person is operating. All ITMs reported that they had either an exclusive role to play in setting the ICT agenda or a central role with either input to IT steering committees or consultation with all levels of staff and students.

Further to the importance of setting the ICT agenda the literature reported that the digital literacy of the SMT has a considerable bearing on the level to which the ITM is expected or allowed to operate at in an organisation. The ITMs' view of the SMT digital literacy depended on which member of the SMT was being considered. In general the Presidents were seen as having average digital literacy with only two Institutes reporting anything better than this. However this was not seen by the ITMs as being important as the President could not be expected to be a subject expert in each department in the Institute. When asked about the wider SMT, the impressions given were of a mixed bag of abilities. Each Institute has a Computing Department and in many cases the former Head of this department would have risen up to Head of School position and thus be part of the SMT and would be presumed to have good levels of digital literacy. However with the rest of the team it varied widely from having little or no literacy or interest in IT to those who might not come from a computing background but who had shown an understanding and an interest in IT. There were also reports of senior managers who might consider themselves to be very digitally literate on foot of being able to handle some basic computer tasks but in the opinion of the ITMs really did not understand IT in all its complexities.

Importance of Information

The level of digital literacy then informs the degree to which digital information is important to the Institutes. When asked how important it was for ITMs to maintain accurate and up to date information for the Institutes there was a wide variation in the roles that ITMs were playing in delivering information. Some saw it as a critical service to the Institute, others saw it as growing in importance and they would respond to requests for information if any were made rather than proactively providing information. In other Institutes still the ITM was working at arm's length from information and only really getting involved when there might be a problem with hardware. In these Institutes separate business units in the organisation were responsible for delivering information and not the IT Department. This once again reflects the mixed sizes and other varying factors which define each Institute. However there was an acknowledgement of

the growing importance of digital information to the Institutes with many ITMs suggesting that Institutes could do a lot more with information to get better value out of it.

To further examine the importance of accurate information, discussion elicited concerns about the integration of the use of information across the Institutes. Various reasons were given for the absence of integration from lack of resources to lack of demand but a consistent complaint was the constraints surrounding the use of the nationally supplied management information systems which all Institutes are obliged to use. These were seen in many cases as being the root of the problems as they created silos of information in the Institutes which were not easily integrated. While recognising that the integration of the use of information could be better, all ITMs had the desire to improve this situation in the future but required more resources and more freedom to manage their own information first before things could improve.

Online Survey Opinion

It may be recalled from the findings of the online survey that the ITM score followed the same general pattern as the scores for peer groups of ITMs in the industry. To give the ITMs in this survey an opportunity to discuss the findings there was an open question to get feedback on the surveys.

There were mixed views on the survey; some people felt that it was not applicable to public sector jobs and really only spoke to corporate America ITMs and therefore left some questions blank which would account for low scores in some areas; particularly in the questions on governance and strategy. Others felt that even though it was aimed at the corporate world that the general thrust of the questionnaire could be applied to ITMs in the public sector. This was taken a step further by those who said that they did resonate with the questions and found them very useful as a mechanism for making them think about their own posts and what they should be doing. There were ITMs who said that they had even come back to it again subsequent to completing the survey to pick up on ideas of how they might improve their own performance.

Performance and Value Metrics

This section and the next one on communicating value both tie in with the conclusions of the Mitra *et al.*, (2011) study and identify which metrics ITMs might use to measure their own performance and which metrics stakeholders in the Institutes might use. The ITMs overwhelmingly rely on response times to service desk calls and service availability; all ITMs mentioned these. Other items mentioned were user satisfaction, attitude of staff so that even if there was an outage in service or some other problem that it would be the attitude of the staff dealing with the end user that was as important as resolving the issue. Availability of printers, wireless networks and appropriate software were the other issues mentioned.

In contrast, the view of the ITMs was that stakeholders would use metrics such as: on time, within budget, delivers what was expected to the satisfaction of the end user as the important metrics. Other items to get a secondary mention included: the level of disruption caused by

implementing the project, the value that the project delivers to staff or students and that the project was managed well from beginning to end. However it was pointed out that sometimes IT might not get the credit for new innovation as people might simply see that they have a new way of doing things without realising that it was IT innovation that was at the heart of it.

The methods employed by ITMs to measure the quality of the service that they deliver included feedback at helpdesks, numbers of calls logged and more formal surveys from time to time for day to day operations. The main area of concern is to maintain a stable IT service in the Institutes which is in line with what they suspected the stakeholders would include in this category also.

The way that the ITMs would measure success of new processes or projects as opposed to operations varies from what they think the stakeholders might be looking for. The view of the stakeholders' important indicators of success included: on time, within budget, delivers what was expected to the satisfaction of the end user. However the ITMs had a slightly different view of success of projects or process change which focused more on the uptake of the new systems; were people using them and did they take ownership of them once they had been completed? There were no formal systems of measurement in this area and all measurement was either anecdotal or informal, but a project that was rolled out that placed a higher level of support on the IT Department to maintain was seen as not desirable.

The stakeholder view and the ITM view of performance metrics was compared with what the SMTs might use as performance metrics for the IT Department which is in keeping with the literature. Whereas the question is listed under performance metrics it ties in with the next and final topic of communicating value as CIOs who move up the value chain in delivering services are the ones who can communicate with the SMT in terms of the value that the senior team expects to get from IT. The unanimous position was that there is no formal measure in place and that normally the interest that the President and the rest of the SMT takes in IT performance is minimal. There is however one exception where the President requests regular updates from the ITM. The more normal position is that the SMT prefer not to hear about IT as if they do, it normally means that there is a problem and then the ITM is called into account for it. There is also a common view expressed that IT is seen as a cost or even a necessary evil or burden that the Institute has to live with. However there is a belief amongst the ITMs that the SMTs understand that IT can make a big contribution to delivering student services and that there certainly is value in that. Some ITMs recognise the potential for disconnect with the SMT due to the lack of formal performance measures and can try to alleviate this by managing up the chain of command in the Institutes.

Communicating Value

The final section of the interview questioned opinion on how the ITMs communicated the value of IT to the SMT and to the wider community of stakeholders. The replies were evenly split into those who said that they did not communicate value or did it very poorly and those who had a

more regular method of communications. Amongst those who did not do it at all or only poorly there was a recognition that it was something that did need to be addressed and would be in the future. However there were also ITMs who felt that communications about IT value were of little interest to peers or senior managers; services that worked spoke louder than any communications from the ITM. It was also felt that just as performance can be assessed by the amount of negative feedback that the SMT might get that value from IT could be communicated by the end users who might report an improvement in service or efficiencies due to some IT initiative. Among the ITMs who said that they did engage in communicating value regularly, presentations at senior management meetings and staff e-mails were seen as popular mechanisms for doing so.

Communicating the value of IT to the Institutes was reported to have changed very little over the last five years; people still expected the IT Department to deliver services effectively and efficiently. The only area where change may have happened was in the type of technology considered as delivering value. For example, five years ago very few if any Institute would have rated provision of wireless networks very high on any chart of items to watch whereas now it would be very high on everyone's list. However the reason for considering it now would be the same reason that anything else may have been considered five years ago; is it stable, delivering a service and at a price that we can afford?

Discussion

In this section the ITM role in the IoTI sector is placed in the Peppard *et al.*, (2011) five CIO roles (Appendix E). The most appropriate performance metrics are identified from the Mitra *et al.*, (2011) study (Appendix G) and then areas for improvement are discussed. While both the Peppard *et al.*, (2011) and the Mitra *et al.*, (2011) studies are central to identifying the levels at which ITMs in the sector are operating at, neither of them offer the reader any guidance on how to improve these levels. The Broadbent and Kitzis (2004) book in contrast is written with improvement in ITM performance as the goal. Therefore in this study the level that the ITMs are operating at; whether this is what the ITMs want to operate at themselves or whether this is what the sector wants the ITMs to operate at, is identified and the comparative scores from the online surveys are used to measure against peer scores to determine the areas where improvements can be made. The suggestions from the Broadbent and Kitzis (2004) book are then examined for applicability to the ITMs in the IoTI sector.

Role of the ITM in the IoTI Sector

The interviews were analysed against each of the categories in the literature to identify at which level IT management in the IoTI sector is currently operating at. The results of this analysis are shown in Figure 11. Taking the scope of the role, the interviews identified a grade of management where half of the incumbents reported to the CFO and there was a very strong bias in favour of IT supply. However there was also a consistent view that ITMs were engaged in changing mind-sets about information and all were involved in identifying sources of new

technology and raising the profile of IT as a solutions provider. This correlates with the online survey where ITMs in the sector compared well with peers in the areas of leadership, creating a vision and shaping informed expectations. None of the ITMs reported that they were actively engaged in empowering and enabling the business with information capabilities, rather they expressed some frustration with constraints in doing this. Thus a rating of half way between Evangelist CIO and Innovator CIO is appropriate.

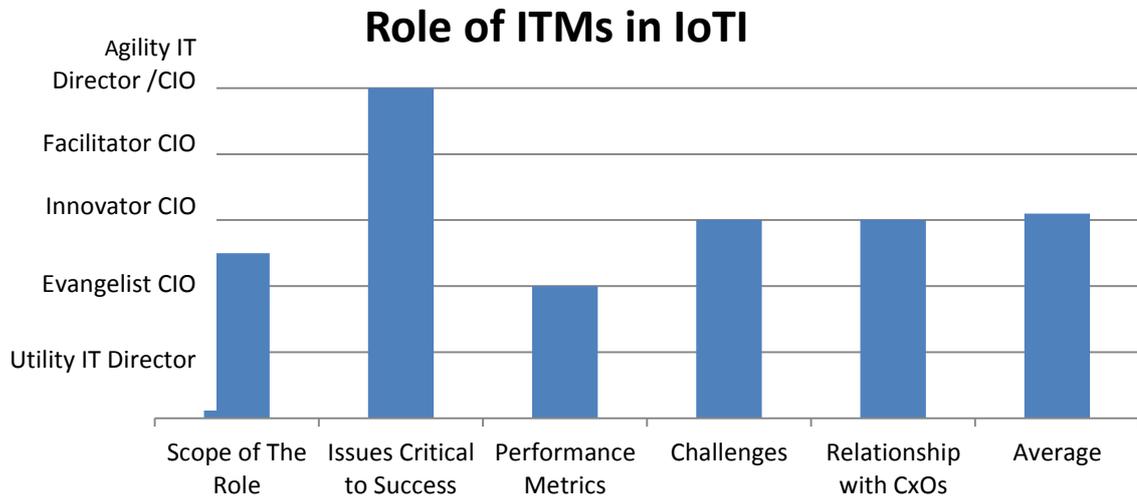


Figure 11: Role of ITMs in IoTI

In issues critical to success, it was clear that all or the vast majority of ITMs in the sector affirm that the issues that are critical to success for them are those which an Agility IT Director/CIO would select: maintaining service levels, identifying emerging technologies, ensuring integrity and agility of technical architecture, reading the technology marketplace and guaranteeing security and privacy. Once again this correlates with the online survey where the corresponding traits: leadership, creating a vision and shaping informed expectations scored highly. Therefore in this category the IoTI ITMs appear to be already operating at the highest level of IT management effectiveness.

The performance metrics category is different. Indicators of operating at higher levels of ITM effectiveness are not as apparent. There were no indications that there was any value placed on innovations developed and there was only one mention of Institutes operating in a competitive environment where information might be used for advantage but even in that Institute there was an acknowledgement that there was a lot of work to do before achieving this. Performance indicators amongst the ITMs were far more likely to suggest a sector ITM operating at Evangelist CIO level.

Under challenges the interviews placed the sector ITM operating at the Innovator CIO level. It was a function of all ITMs to ensure continued investment in strategic opportunities and it was a commonly reported problem that the role required respondents to limit key operational and support applications. The pressure of budget constraints was one reason but staff trying out and

developing new technologies can lead to disparate developments on campus which may be at odds with one another and run counter to central applications that the ITMs are endeavouring to maintain. Gaining active governance of IT at board level was also cited by many as a major problem.

For relationship with CxOs, all 12 ITMs agreed that interaction with the SMT was important to them. Even though there was no consistent formal mechanism across the sector where ITMs were able to interact with the senior team, there were very few problems reported by the ITMs in arranging more informal meetings. There were however mixed views of what the SMT members might think of the ITMs' roles in the Institutes. In those Institutes where ITMs said that they would be considered as a trusted partner, there was a sense that this might not be a universal feeling amongst the entire SMT with some considering them to be simply heading up a cost centre and others considering the ITMs to be the chief technician in the organisation. Thus the rating for this category is Innovator CIO. Indeed when all categories are rated and averaged out across the sector, a picture emerges of a sector wide IT management role of Innovator CIO.

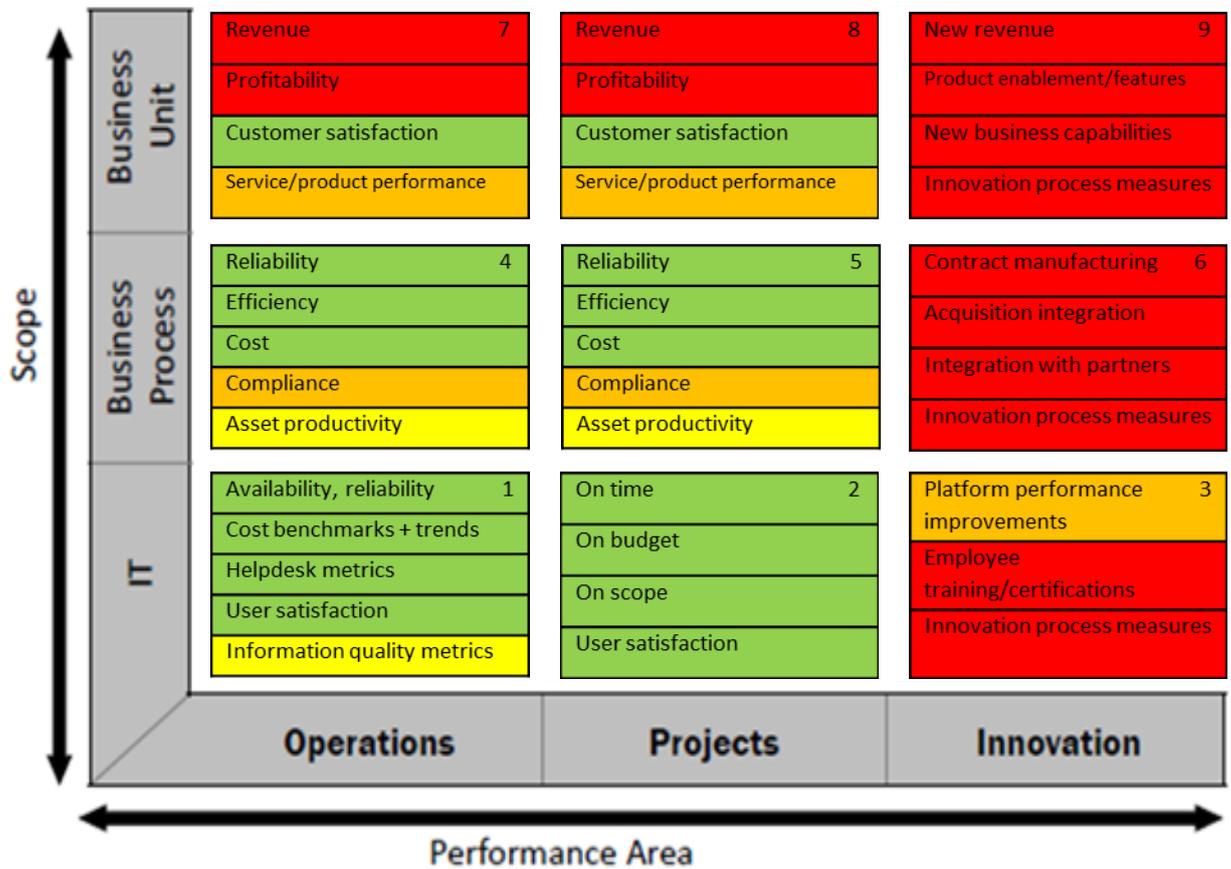
Performance Metrics

In the original Mitra *et al.*, (2011) study focus domains were identified and divided into five different domains: Internal IT Focus, Project Focus, Business Operations Focus, Business Process Focus and Innovation Focus. ITM impact is seen to increase as one moves from Internal IT Focus through to Innovation Focus. The authors assert that by identifying the focus domain of the ITM that it is possible to discover the prevailing views about the organisational role of IT. For this study the discovery of the focus domain of the ITMs in the sector is seen as corroboration of the findings revealed in both the Broadbent and Kitzis (2004) and Peppard *et al.*, (2011) sections of the research and the inclusion of this study serves to add validity to the findings. In the original study, cells were presented as: dark shaded (primary metrics), unshaded (secondary metrics) or light shaded (emerging metrics). This convention is refined for this study with various sub headings within each of the cells being assigned colours as indicated in Table 5. The addition of the red category is to indicate areas where currently there is no activity in the IoTI sector IT management.

Table 5: Importance of Metrics
Primary Metric
Secondary Metric
Emerging Metric
Non-existent Metric

For the performance metrics it is possible to identify the areas in the portfolio of metrics that the ITMs most commonly used to measure their performance and on which they communicate value. Mentions of increasing revenue or other revenue generating activities or profitability were completely absent in all the interviews, so this rules out performance metrics in these areas and explains the high numbers of red cells at the top of the chart. In the middle row there was

however much evidence of performance being informally measured in both the operations and projects areas but nothing to suggest much activity in the business process innovation area. Finally on the bottom row, IT scope, once again there was much evidence of activity in the operations and projects areas but little in the innovation section. Using the refined colour code, the portfolio of metrics for IT management in the IoTI sector is as shown in Figure 12



Legend

7	Business KPIs	8	Business KPI Improvements	9	Business Innovation
4	Business Process KPIs (End to end business productivity)	5	Business Process KPI Improvements	6	Business Process Innovation
1	Operations Performance	2	Project Performance	3	Technical Innovation

Figure 12: Portfolio of Metrics used by ITMs in IoTI

The literature suggests that by “focusing on specific performance areas, CIOs build credibility and improved IT performance more effectively” (Mitra et al., 2011, p. 51). If this is the case then all the non-green cells in Figure 12 and in particular the ones to the right and to the top of the diagram indicate that there is room for improvement by the ITMs in the IoTI sector. Further by only communicating performance in the lower left hand side of the table the perceived impact

that ITMs have on the business is considered to be limited. The Mitra *et al.*, (2011) study advocates that all ITMs should be operating in the bottom left two cells in the portfolio; it's simply part of the job, but by moving the value conversation up and to the right of the cells an ITM can begin to increase their impact on the business.

The aims of this research are to measure the effectiveness of IT management in the IoTI sector and to identify, areas where effectiveness might be improved. By so doing a general instrument for measuring ITM effectiveness is developed. As IT management in the Institutes can be shown to be operating at Innovator CIO level and as there are two levels identified in the literature as being higher than this: Facilitator CIO and Agility IT Director/CIO, then there would indeed appear to be room for improvement. This is confirmed by the numbers of non-green performance metrics being used in the business unit or innovation space of the Mitra *et al.*, (2011) portfolio of metrics. Returning to the Broadbent and Kitzis study of CIO leadership where there were ten categories of ITM activity rated through the instrument of an online survey and compared with peer scores it was found that in certain activities the IoTI ITMs lagged behind the peer scores. These areas of activities where there is a negative gap in the ratings are therefore identified as the ones to concentrate on in an attempt to improve ITM effectiveness.

Areas for Improvement

The first area below the peer score in Figure 10 and therefore more likely to have potential to improve is knowing the enterprise fundamentals. That is not to say that all areas cannot be improved on simply that those below peer scores are more likely to have room to improve. The replies showed only a 50% rating by the ITMs of the importance of their business knowledge to their roles. Although views were expressed as to the need to increase business knowledge, there is still an emphasis on technical skills. In spite of some of the reservations expressed by the ITMs of the applicability of the study to the public sector Broadbent and Kitzis (2004) do recognise that "*Government organizations have operating models rather than business models*" (pg. 42). The important thing for ITMs is to understand how their Institutes' business model works as if "*you don't understand your organizations' model and how it works, you and your IS organization can hardly envision ways technology might improve it*" (pg. 41). It is important therefore for the ITMs to understand key strategies of the Institutes as this is how senior management will measure the success or failure of many initiatives. During the interviews there were many references made, under challenges faced, to this very point; several ITMs felt that due to changing government policy and ongoing merger talks between groups of Institutes in the sector that this was an increasingly challenging environment to know exactly what the sector will look like in the short to medium term. It is all the more important for ITMs therefore to keep in close contact with these developments and to look for opportunities for IT to contribute to the future development of the Institutes.

To ensure that ITMs are kept up to date with developments it is important that they continue to engage with members of the SMTs and other important stakeholders in the Institutes. None of the ITMs reported difficulties interacting with the SMT however there were some reservations

expressed about individual senior managers' views of the contribution that ITMs make to the running of the Institutes. It is important for ITMs to continue to work with these managers as without *“proper management, stakeholders may block your initiatives or simply become passive participants who do not contribute to the initiatives success”* (Broadbent and Kitzi, 2004, p. 48). Also the importance of one-to-one interaction is recognised and encouraged with the advice being that if ITMs want to increase the support that they get from individuals they must first give attention as it is a two-way interaction. This applies to all stakeholders and not just senior management. Broadbent and Kitzi identify a chart of stakeholder attributes illustrated in Figure 13 which should be used to identify where effort is required to increase one's influence. By concentrating on the people identified as falling into the bottom right hand quadrant in the diagram; people adopting a stance that is negative to the ITM view and who have high pull in the Institutes to influence others, the ITMs will better their chances of success.

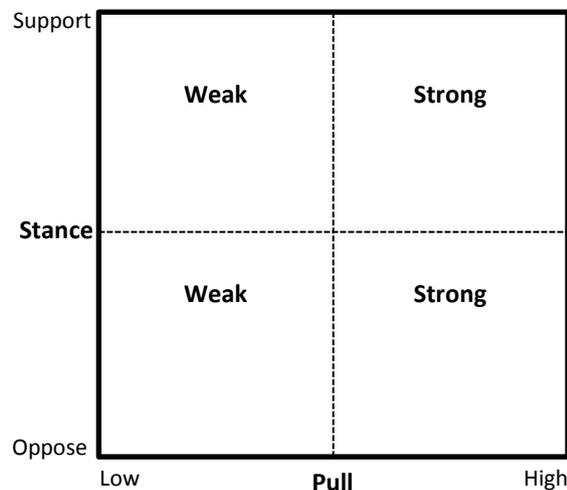


Figure 13: Stakeholder Quadrants (Broadbent and Kitzi, 2004, p. 52)

A root cause of the problems faced by ITMs to influence decision makers in the Institutes was identified as not being part of the SMT. Broadbent and Kitzi address this by saying that it used to be the case that credibility was measured by reporting directly to the CEO in an organisation or being a member of the executive committee. However this may be changing for CIOs who use the degree of regularity with which they attend executive meetings as equally important in increasing influence. Either way, membership of the SMT is seen by many in the IoTI sector as being important for them to increase effectiveness and this may be more reflective of the conservative nature of academia and therefore more important than for some of the ITMs in the Broadbent and Kitzi study who were working for publicly quoted firms on the stock market.

The next, and biggest, area to show negative comparison with peer ITMs is in the category of building good governance. This is confirmed throughout the interviews where the vast majority of ITMs expressed having problems or concerns about governance. Broadbent and Kitzi (2004) remind us that it is through good governance that issues are prioritised and decisions are made

on which demands are to be met. It also gets those who demand IT services involved in decision making and can determine how IT investment decisions are made, who gets to make them and who's accountable for what. New CIO leaders can use IT governance to help cut through the increasing complexity of technology by getting greater buy in from executives and business units in the organisation. However a recurring comment throughout was the problems posed when major IT decisions were made exclusively by executives without any involvement of ITMs at all. Of particular concern was the manner in which management information systems are managed as a central service nationally for the sector. Major decisions regarding selection of software applications and decisions about changes are made by the national board of this central service which consists of executive members from various Institutes but there is no representation from ITMs on this board. This may be seen as the root of the problem; however the sector might be better served by viewing this scenario as a symptom of how much ground there is to make up. If there was proper IT governance in the Institutes in the first place, by definition, this situation would not continue as ITMs would have to be involved in this process.

Having identified the problem, the question then arises as to how to tackle it. The literature suggests that enterprises, both commercial and non-profit ones are all controlled by some sort of body which is responsible for corporate governance. This is no different in the IoTI sector where each of the Institutes is required to have, by statute, a Governing Body. This body deals with corporate governance and as Broadbent and Kitzis (2004) suggest are becoming more interested in the risk posed by technology. By concentrating on the risks associated with technology ITMs can raise the level of awareness of IT matters and in so doing increase the level of IT governance in the sector to a more appropriate level.

The next area to look at for improvement is to weave together business and IT strategies. A cross reference with the interviews shows that the vast majority of ITMs agree that having an up to date IT strategy is very important, but there is not as much of a consensus on whether or not IT strategy is being developed in the optimum way; there are Institutes where ITM involvement in strategy formulation is very limited. This may be tied in with poor governance as according to the literature IT strategy formulation is bringing IT governance to the next level of specificity by agreeing a targeted set of objectives, initiatives and investments for a specific period (Broadbent and Kitzis, 2004, p. 129).

The suggestion by Broadbent and Kitzis (2004) to improve the integration of IT strategy into the business is for ITMs to develop a set of IT-related opportunities (ITOs). The objective is to identify and suggest innovative and radical solutions to problems that require "out-of-the-box" thinking which may be stifled in the more deliberative process of IT strategy. These ITOs are often proposed as a result of emerging new technologies which present a different way of dealing with problems. The ITMs in the sector are well placed to do this as all ITMs reported that identifying new technologies and selecting the right ones for their Institutes is a core function of their roles.

The next area for potential improvement is to build a lean and focused IS organisation. There are two suggestions: organising activities into process-based work and to engage in strategic outsourcing. The literature suggests taking a fresh look at IT supports in an organisation and organising them around the processes that they support rather than around functions, platforms, or skill sets which they may have been more traditionally organised by. This could mean working more closely with academic or other departments in the Institutes to ensure end-to-end workflows are supported. There are no clear examples given for academic Institutes but with reference to the interview questions, ITMs reported that their knowledge of the business was not as valued as it could be and that they were largely trusted to identify opportunities and get better value from IT in the Institutes on their own. There could therefore be opportunities for ITMs to volunteer their services in what might be considered to be the more traditional business areas of the Institutes with a view to identifying workflows that could benefit from a redesign with greater IT support.

The second part of the suggestion was to engage in more strategic outsourcing. This, it was suggested, should be realised as a means of refocusing on value added activities rather than as a cost saving exercise. Where activities are identified as requiring a lot of technical support for very little added value, these should be outsourced if possible allowing for a redeployment of resources to deliver more focused support for value add activities. Outside of the replies to the interviews for this study, the author is aware of a movement in this direction already; for example, some Institutes have outsourced their e-mail systems and many more are looking at the success of this outsourcing to evaluate their own e-mail requirements. The advantages are the cost savings realised by not having to procure and maintain hardware which is installed locally nor is there a need to maintain up to date back end e-mail skills to support such systems. The technical resources required to support mail can now be diverted to other systems which deliver more value to the Institutes.

The next category for improvement is to develop a high-performing IS team. Coupled with new technologies being introduced and some technologies being outsourced, there is a constant imperative to ensure that ITMs and staff in the IT departments keep their skills up to date and relevant. This can be achieved by having regular and relevant training courses for all staff in the departments. However according to the literature “softer” human skills required in a successful IT department are every bit as important as some of the other issues that have already been covered. There is great emphasis placed on the emotional intelligence of the ITM and other senior staff in the department to provide the leadership required to run a successful IT department. However there is also recognition that very often ITMs and other IT staff are promoted primarily as a result of superior technical skills. The benefits of high emotional intelligence for ITMs is that it improves team performance by providing clarity of direction and procedures, assists in organising work groups or teams to maximum benefit and gets the most out of staff by understanding individual needs and personalities. While there was no direct question in the interviews on emotional intelligence or on teams, the ITMs combined to mention teams on no less than 100 occasions throughout the interviews in terms of the importance they

place on proper functioning teams and their own responsibilities to the teams. This suggests that ITMs are already aware of team needs and their obligations towards them. Also mentioned in the interview were unions and culture (up to 25 times) as barriers to developing better functioning teams.

To improve the area of managing enterprise and risks, activities such as risk assessment, educating colleagues, integrating IT risk with enterprise risk, security governance etc. are examined. Including risk as a means of increasing IT governance has already been discussed but what remains for the ITM to do is to ensure that risk assessment is kept current and examined under the headings of mitigation, transfer, acceptance and avoidance. Whereas neither Peppard *et al.*, (2011) nor Mitra *et al.*, (2011) mention managing risk as contributing to ITM effectiveness Broadbent and Kitzis (2004) include it as they recognise the damage that can befall an ITM and an organisation if IT risk is not managed properly. Peppard *et al.*, (2011) mention the importance of maintaining up to date and accurate information and the impact that the level of digital literacy of the SMT can have on ITM effectiveness and in this context it is clear that the maintenance of accurate and up to date information, while important, is not a top priority for all ITMs in the sector and that the assessment of the digital literacy of the SMTs varied amongst individuals and Institutes but was not seen as being important for senior managers. This might explain the ITMs scoring lower than peers in risk management. None the less, it does point to an area for improvement.

The final category for improvement is to communicate value and performance. This correlates with the interviews when ITMs themselves recognised that they could improve this aspect of their operation. However some were not quite as inclined to do so as it was felt that senior managers or other members of staff were simply not interested in hearing how IT was doing. This might be, as Broadbent and Kitzis (2004) suggest, because IT is speaking a different language to that of the audience it is trying to communicate with and even though “*the specific value of IT is often hard to determine, every company has invested large sums in technology projects*” (Broadbent and Kitzis, 2004, p. 244). The authors state that technology investments have often been described in terms of the technology itself rather than in value terms that mean something to shareholders. For shareholders, ITMs in the IoTI sector could substitute SMT and other stakeholders. To integrate business value measures with IT value indicators the suggestion is to identify some measure of business value that can be shown to benefit from IT. This could, for example, be the provision of a wireless network; increasingly students are blogging online or posting comments on electronic notice boards about IT facilities in colleges leading to an enhanced or damaged reputation for a college with potential subsequent knock on effects for student numbers. Another suggestion that the authors make is to use previous strategic initiatives as a hook on which to attach an IT link to which value can be communicated. For future strategic initiatives opportunities should be identified at the beginning of a project to measure the value that IT brings to the initiative.

By adopting these initiatives, summarised in Table 6 the journey along the road to the Agility CIO will be progressed. For example, on the scope of the role, through becoming more involved

in the business processes of the Institutes the ITM would raise their profiles through empowering and enabling the business with information capabilities. This would raise the value of innovations developed by IT and increase assessment of IT performance. This would undoubtedly lead to ITMs operating at a level which would require tighter integration with the SMTs in the Institutes leading to greater ITM effectiveness. In a similar fashion by improving on the areas identified as being weaker than peers in the Broadbent and Kitzi's survey, the focus of the ITMs as described by the Mitra *et al.*, five focus domains moves further along the value chain to include more business process focus discussions and innovation focus for the ITMs.

Table 6: Areas for Improvement	
Area for Improvement	Suggestion
Knowing the Enterprise Fundamentals	<ul style="list-style-type: none"> • Keep in close contact with these developments and to look for opportunities for IT to contribute to the future development of the Institutes • Continue to engage with members of the SMTs and other important stakeholders in the Institutes
Build Good Governance	<ul style="list-style-type: none"> • Increase the level of governance by concentrating on risks posed by technology
Weave Together Business and IT Strategies	<ul style="list-style-type: none"> • Develop IT related objectives (ITOs) and suggest innovative and radical solutions to problems that require “out-of-the-box” thinking
Build a Lean and Focused Organisation	<ul style="list-style-type: none"> • Organise activities into process based work • Strategic outsourcing
Develop a High-Performing IS Team	<ul style="list-style-type: none"> • Maintain up to date technical skills • Ensure emotional intelligence in the department is not overlooked
Manage Enterprise and Risks	<ul style="list-style-type: none"> • Keep risk assessment current and examined under the headings of mitigation, transfer, acceptance and avoidance
Communicate Value and Performance	<ul style="list-style-type: none"> • Identify measures of business value that can be shown to benefit from IT and communicate them

Conclusion

This research set out to determine whether or not the current IT Management structures and roles in the IoTI sector remain relevant and effective to meet the challenges presented by the changes which have occurred in both technologies and the environment in which the IT Manager operates today. To do this the current levels at which the ITMs operate at is assessed and compared with peer scores of effectiveness to determine areas for improvement. The ITM roles were established in the IoTI sector in the 1990s before the widespread adoption of the internet, e-mail or mobile phones but the structures today remain largely unchanged. Through the changes in technology and the changes in higher education globally and with proposed mergers and possible changes of focus of Institutes, it is important that the role of ITM be assessed to maintain relevance for the position within the management team of HE.

The literature on the topic of IT or CIO management was examined and three relevant studies were chosen on which to base a conceptual framework for the study. All ITMs in the sector were

surveyed and engaged in follow on interviews to assess the current level at which IT management was functioning in the sector. It was shown that overall IT management in the sector is operating at a level equivalent to Innovator CIO which leaves room for improvement up the scale to both Facilitator CIO and Agility Director/CIO. Also it was found that the ITMs perform well at both an operational level of detail and at delivering projects but that there is room to be more effective at innovation.

The more specific recommendations from the study concerned with increasing IT management effectiveness in the sector are varied and not all within the remit of the ITM as currently structured. The approaches to increasing ITM effectiveness included understanding key strategies of the Institutes and aligning IT with them as this is how senior management will measure the success or failure of many initiatives. However changes in the sector due to mergers and collaborations point to a sector that is currently in flux and therefore proving difficult for ITMs, and others, to understand all the key strategies. If anything this increases the importance of continuing to engage with members of the SMTs and other important stakeholders as this is the mechanism through which ITMs can improve their understanding of key strategies and become more relevant. This suggests ITMs becoming part of the SMTs or at least having more regular meetings with the executive committees to discuss strategic objectives and opportunities for IT to play a part. The key objective is that IT strategy is kept up to date with Institute requirements. There is evidence however of the beginnings of awareness of the importance of properly functioning IT systems as now both finance processes and IT systems need to be signed off on during audits and IT appears as a section on its own in due diligence documentation connected with merger talks.

The topic of governance is one that needs to be addressed in the sector as this is how issues are prioritised and decisions are made which affect investment in IT and identifying who is accountable for what. There are benefits to raising the risks of underperforming IT governance as by concentrating on the risks associated with technology ITMs can raise the level of awareness of IT matters and in so doing increase the level of IT governance in the sector. This should help also in building a more focused IS organisation capable of organising activities into process-based work and to engage in strategic outsourcing. By engaging in governance issues, the ITMs are obliged to leave behind the more technical aspects of their roles and become more involved in the business areas themselves. However to succeed this requires more engagement by the current SMTs in the sector as there is little evidence of an appreciation by the SMTs of the impact and importance of IT to the sector. To improve this ITMs need to improve their communication to SMTs and other important stakeholders on matters which are important to them and in a language that they can engage with.

ITMs need to remain alert for new opportunities that present through the development of new technologies which includes strategic outsourcing. In the past any mention of outsourcing had connotations of staff losing their jobs however strategic outsourcing is more about the ability to refocus efforts on activities that deliver more value added services to satisfy internal demands rather than engaging in high-end technical activities to keep hardware running that could be

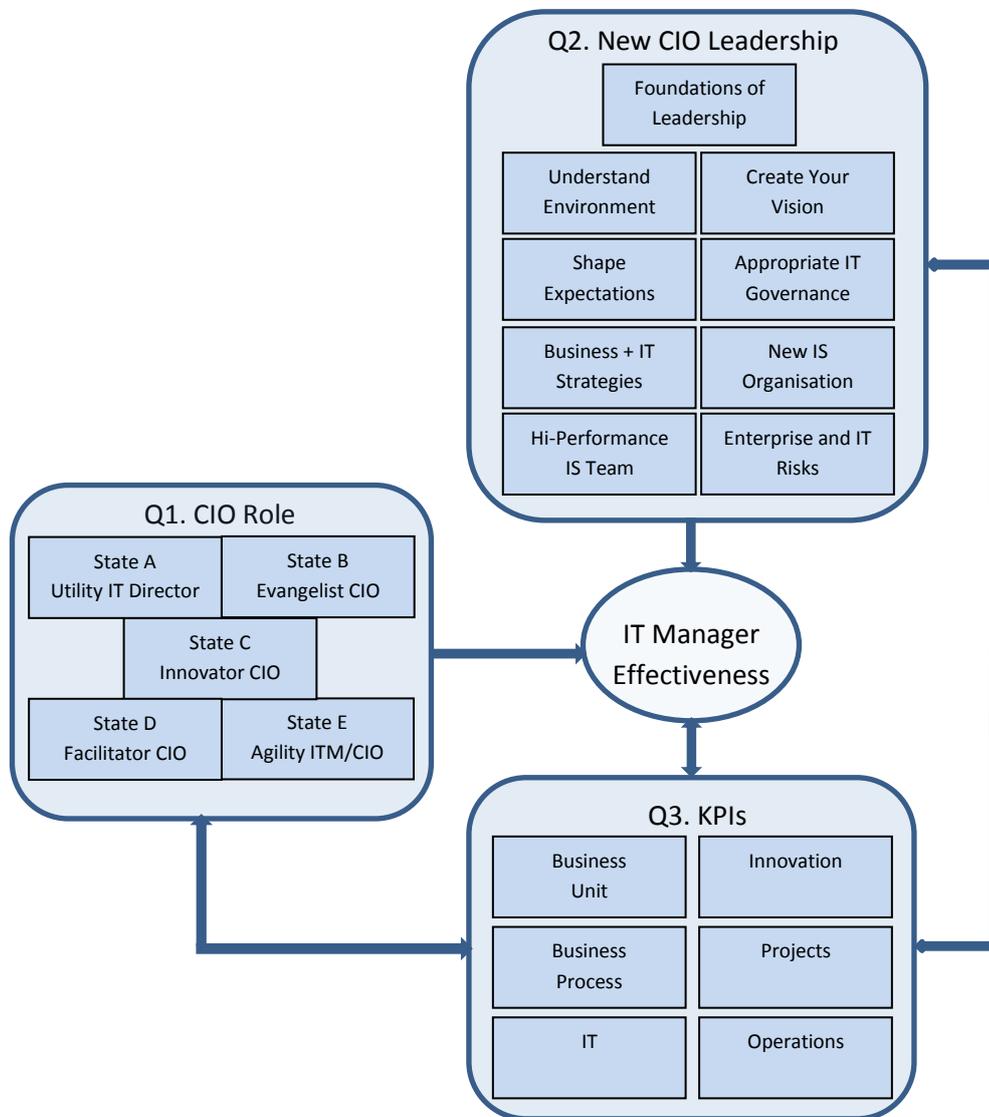
maintained off site. As leadership, creating a vision or shaping informed expectations were shown to be at or above the peer competencies in industry, this should prove achievable for the current ITMs. However this requires entrusting them with the appropriate levels of authority to do so. As a group they are already acutely aware of the issues which are critical to success but they do not seem to enjoy the authority identified as necessary on the supply side of the services to deliver on these needs as effectively as they would hope to do so.

This study concentrated on one section of higher education in Ireland, i.e. the IoTI sector but there is another section to this: the University sector. There is scope for future research to extend this study to include the University sector to see if there are similarities with the group of Computer Centre Directors (CCDir) in that sector and to explore possibilities for joint strategic outsourcing projects between both sectors. Currently the entire HE sector shares a common research network for Internet connectivity through HEAnet¹⁵ where the synergies of both sectors are used to deliver exemplary networking services. It is not difficult to imagine that there could be other possibilities for further collaboration across the total HE sector to produce equally successful results.

This paper deals specifically with the findings in the IoTI sector under the headings identified in the conceptual model. Proposals for future research and contributions to knowledge and practice will be dealt with in the next section along with emergent issues. Changes in the sector due to mergers or wider changes in education globally will require a close examination of all management layers in the sector; this study points the way forward for the IT management section of this review.

¹⁵ For more information go to www.heanet.ie

Appendix A Conceptual Model of IT Manager Effectiveness



Appendix B List of Participating Institutes

With grateful appreciation to the IT Managers in the following Institutes who gave so freely and openly of their time in the course of this study.

Athlone Institute of Technology

Institute of Technology Blanchardstown

Institute of Technology Carlow

Cork Institute of Technology

Dún Laoghaire Institute of Art, Design and Technology

Dundalk Institute of Technology

Galway-Mayo Institute of Technology

Letterkenny Institute of Technology

Limerick Institute of Technology

Institute of Technology Sligo

Institute of Technology Tallaght

Institute of Technology Tralee

Waterford Institute of Technology

Appendix C New CIO Leadership Survey

Survey available at:

http://www.gartner.com/5_about/news/gartner_press/NewCIO3.jsp

Welcome to the New CIO Leader Assessment

The assessment is organized into 10 sections matching the 10 priorities for a New CIO Leader. In each of the sections, you'll rate your level of agreement or disagreement with a number of statements related to that priority. When you finish responding to all of the statements, you'll receive a customized assessment of your current position on the path to becoming a New CIO Leader.

Each section has 5-10 questions. You should expect the assessment to take between 15 and 30 minutes. However, at any point in the assessment you may save your responses and return later to complete the remainder of the questions.

Please tell us about yourself. This information will help us customize the results of your assessment.

CHAPTER 1: The New CIO Leader

- O1. I have a compelling vision for how we can use IT to enable the enterprise and move to the next level of performance.
- O2. I can express my vision in a concise "pitch" that grabs the attention of others and excites them
- O3. I spend more and more of my time building and maintaining relationships with my executive colleagues.
- O4. I have developed my emotional intelligence, particularly my social awareness and empathy, so that I can be a good leader.
- O5. I know how to "lead from the back" when I don't have formal power and use my skills of persuasion to influence others.
- O6. I have fine-tuned my leadership skills so that I am able to modify my style to fit both the situation and the constituency I want to influence.

CHAPTER 2: Understand the Fundamentals of Your Environment

- O7. I can articulate the basis on which our enterprise competes in our industry (or provides services if in the public sector).
- O8. I understand our business fundamentals and know how to interpret our performance and financial statements (e.g., balance sheets, income statements), as well as other financial, regulatory, or legislative reporting requirements.
- O9. I understand the unique operating characteristics of our business units and the need to make trade-offs between synergy and autonomy as part of our enterprise strategy.

- O10. I meet with CEO or senior-most officer regularly and know his or her top priorities and strategic initiatives.
- O11. I know and understand the top priorities of the senior executives for each major business or area of the enterprise, and these executives know me.
- O12. I know and understand the performance requirements of the senior executives for each major business or area of the enterprise, and they know mine.
- O13. I have a strong working knowledge of our industry and am on top of emerging trends and issues.
- O14. I have identified the key internal and external stakeholders, and am proactively managing my relationships with them.

CHAPTER 3: Envision Your Enterprise as Truly IT-Enabled

- O15. I have a deep understanding of how my enterprise is IT-enabled today.
- O16. My business colleagues look to me to understand how our enterprise can be IT-enabled.
- O17. My vision is articulated and documented, and my business colleagues can and do understand it.
- O18. As CIO, I am proactive in ensuring we have a process for identifying IT-enabled business opportunities.
- O19. Members of my IS leadership team are actively involved in identifying IT-enabled business opportunities.
- O20. I am constantly examining how we can use our IT resources to extract greater customer value and economic return.
- O21. I have integrated network-era thinking (e.g., cheap computing power, bandwidth, ubiquitous communications) into my vision of how my enterprise can meet its business goals.
- O22. I have asked all senior executives what real-time information would enable them to better meet their goals and have a plan to deliver that information.
- O23. I have successfully secured resources for innovation and investment by linking business demand and persistent business needs to technology opportunities.

CHAPTER 4: Shape and Inform Expectations for an IT-enabled Enterprise

- O24. I have invested time with my business colleagues so that both they and I understand the extent to which leveraging synergies across business units matters to our enterprise.
- O25. I have invested time with my business colleagues in workshops or other processes so that all parties understand the business maxims of our enterprise.
- O26. I have invested time with my business colleagues so that they understand the IT implications of any business decision.

- O27. Working together, my business colleagues, my team, and I have developed IT maxims that express how we need to design and deploy IT across the enterprise to connect, share, and structure information.
- O28. I have communicated our IT maxims appropriately within the enterprise; my staff and my business colleagues know and understand these IT maxims well enough to use them as guidelines for making decisions and taking action.
- O29. I have been able to use IT maxims to identify potential infrastructure and shared services strategies that will create synergies (if appropriate) and savings for the enterprise.

CHAPTER 5: Create Clear and Appropriate IT Governance

- O30. I have actively engaged business units, senior executives, and key stakeholders in the creation of our governance process.
- O31. Our governance model clearly defines who has input into each IT decision and who owns the final decision rights.
- O32. Our IT governance process actively involves both the CEO and the CIO in appropriate decision-making activities.
- O33. Our governance model addresses all five IT domains (IT maxims, architecture, infrastructure, business applications, investments).
- O34. I have actively communicated our IT governance arrangements so that they are understood by the business units and so that business executives are active participants.
- O35. The clarity of our governance models has allowed us to make better investment decisions, with greater speed.
- O36. Our governance process has clear and well-understood exception processes.
- O37. Our IT governance process is functioning well enough that we will not have to make major revisions within twelve months.

CHAPTER 6: Weave Business and IT Strategies Together

- O38. My business colleagues understand the challenges of integrating business and IT strategies and plans.
- O39. Our IT planning process is flexible enough that it can rapidly reflect changes in our business environment along with incumbent shifts in our technology investments.
- O40. Our IT strategy is based on a firm foundation of good IT governance and clarifies both infrastructure and business application objectives and investments.
- O41. Our IT strategy ensures that we have properly prioritized our portfolio in light of business needs and our IT maxims.
- O42. Our IT strategy makes visible the linkages between IT and customer and shareholder benefits.

- O43. Our IT strategy has been built on a sustainable portfolio of services and capabilities that the governance process has identified and that links investment decisions to specific business needs.
- O44. We have a process for regularly reviewing the portfolio with business colleagues and the executive committee so that they understand what my team is doing and how it relates to business needs.
- O45. My team and I actively manage the portfolio, including prioritization and balancing risk and resources.
- O46. The portfolio is expressed in terms that make the IT investment strategy understandable to the board (or political constituents) and is clearly linked to business priorities.
- O47. We use a variety of funding mechanisms beyond the annual corporate budget to fund our portfolio.
- O48. We manage our IT-enabled opportunities (ITOs) in a fashion that allows us to rapidly assess opportunities, make investment decisions, and track outcomes.

CHAPTER 7: Build a new IS Organization

- O49. My “C” –level peer executives (e.g., CFO, COO) believe I run an appropriately lean and business-focused IS organization.
- O50. My IS team knows how to work well with external organizations that are part of our enterprise value chain.
- O51. I have begun organizing my IS team toward a process-based model whereby people, operations, and technology are structured around end-to-end work flows rather than functions, platforms, or skill sets.
- O52. I have adopted, or am moving toward, other forms of IS Lite, such as creating centers of excellence.
- O53. I have hired and trained relationship managers who have good communication skills, have credibility with both IS and the business units, and can drive IS delivery to high customer satisfaction.
- O54. I have created a dedicated resource inside my IS organization to assess opportunities to strategically source services and partner for external services where appropriate.
- O55. Managing the full sourcing life cycle (e.g., the evaluation, selection, and management of external service providers) is viewed as an IS competence by my business peers.
- O56. I am considering sourcing opportunities beyond basic utility deals, such as enhancement contracts, which reengineer an existing process, or frontier contracts, which add significant value to existing business activities.
- O57. My IS organization uses consistent corporate standard accounting mechanisms to account for all IT services costs.
- O58. My business colleagues and I understand IT services costs, including trends, at the top line and for individual IT services.

CHAPTER 8: Build a High-Performing Team

- O59. I have assessed my strengths as a leader, including my emotional intelligence; specifically, the capacity to recognize my own feelings and those of others.
- O60. I have put in place training opportunities for my IS leadership team to develop their emotional intelligence.
- O61. I have analysed the task, individual, and group needs of my team members and regularly assess the degree to which I am fulfilling the team's individual and group needs.
- O62. I understand my dominant leadership style and that of each member of my leadership team.
- O63. I have become more adept at knowing when it is appropriate to employ different leadership styles inside my IS organization; I have implemented training on leadership styles for my IS team.
- O64. I know the critical competencies my IS team requires.
- O65. I have employed a competency-based model to develop the specific roles required for my team.
- O66. I have shared my competency models with the human resources organization and use it as the basis for hiring, recruiting new staff, and training existing staff.
- O67. My IS team has a good mix of appropriate competencies to meet our current and future needs.

CHAPTER 9: IT Risks

- O68. I have examined our risks relative to our key business processes and have translated both tangible and intangible losses into economic terms that my business colleagues can understand.
- O69. I have educated my colleagues regarding the variety of IT risks we face, particularly the newer risk factors.
- O70. Our IT risk management strategy is fully integrated with enterprise risk management.
- O71. I have developed clear and appropriate security governance arrangements that specify who is responsible for making key decisions and who carries accountability for risk related issues.
- O72. We have created a risk council, or something like it, that is composed of senior managers who report directly to the CEO or the CFO and who manage risk across the enterprise.
- O73. I have a risk management plan and process in place that is regularly updated and tested.
- O74. We have trained both IT and appropriate business personnel to be aware of security policies and their own security responsibilities.

CHAPTER 10: Communicate Your Performance

- O75. My business colleagues believe that our IT-related investments help create business value.
- O76. I can link all IT investments to one or more key drivers; top-line growth (revenue), bottom-line growth (earnings), return on invested capital, and reputation.
- O77. My staff and I create a visible trail of evidence between IT investments and business impact for all stakeholders.
- O78. I have built my personal credibility by helping my CEO and CFO (or public representative) show how IT investments support the corporate strategy and the story they want to tell to investors and other stakeholders.
- O79. My CEO asks me to participate in shareholder and investor meetings (or public forums).
- O80. I have clear links between IT performance metrics and business goals or maxims.
- O81. For every IT-related project, we develop business value indicators as part of the business case.
- O82. For every project, we also create quantitative metrics for tracking and ultimately assessing progress toward specific goals and benefits.
- O83. I have a performance dashboard or scorecard that I share with my business colleagues.
- O84. My dashboard include measures of IS readiness for future initiatives.

Appendix D Interview Guide

Remember Yin (1994) skills required by the field researcher:

- To be able to ask good questions and interpret the answers.
- To be a good listener and not be trapped by preconceptions.
- To be adaptable and flexible, to see newly encountered situations as opportunities not threats.
- To have a firm grasp of the issues being studied.
- To be unbiased by pre-conceived notions, and thus receptive and sensitive to contradictory evidence.

Before you start:

- Thank the IT Manager for taking part
- Explain the research again – effectiveness of IT Managers in IoTI. Title: The Role of the IT Manager in the Institutes of Technology in Ireland
- Explain the format of the interview and how long it is likely to take
- Guarantee confidentiality and that all data used in the report will be anonymised
- Confirm permission to record VC
- Confirm that on-line leadership study has been completed and that both of you are looking at the results. This is what will inform the Leadership section of the questionnaire.

2. CIO Role, Peppard

Scope of the role: the intention of this section of the interview is to clarify the role that you play as IT Manager in your Institute. This is also an enquiry into the IT maturity of the organisation, especially at CxO level.

Scope of the Role

Who do you report to?

How long have you been in the position?

Have you seen your role evolve during this time?

How do you see the role evolving in the future?

How would you describe the importance the Institute places in your knowledge of the business of the Institute versus your technical knowledge?

How is this knowledge used to identify opportunities to develop IT in the Institute?

How does the Institute use your skills as an IT Manager to get better value from investment in IT?

How does the Institute use your skills as an IT Manager to develop an agile infrastructure?

Would you say that you have a strategic input into any aspect of the Institute?

Issues Critical to Success: the intention of this section is to establish the importance of the role that you play as IT Manager in your Institute

Issues Critical to Success

How would you describe the most important functions that you carry out?

How important is it for you to attend senior management meetings?

How important is strategy to your job?

How important is it to you to prepare the Institute for new technologies?

How important is it to you to maintain service levels?

How important is it to you to identify emerging technology?

Performance Metrics: the intention of this section is to establish the important performance metrics that you would use to measure your own effectiveness

Performance Metrics

What would you say are the most important indicators of success of your role?

What would you say are the most important indicators of success of your role by the senior management team?

How would you measure the success of any innovation or project that you were involved in?

Would you consider ROI to be important?

Would you consider user satisfaction to be important?

Challenges: the intention of this section is to establish the major challenges that you encounter

Challenges

What are the most serious challenges that you face in your job?

Do you have difficulties delivering on the expectations of the role?

Do you consider understanding of the business to be a challenge?

Do you consider face time with senior executives or other managers to be a challenge?

Is governance a problem for you in your job?

Do you encounter challenges with managing intelligent or demanding users?

Do you encounter challenges with setting technical standards and policies?

Relationship with CxOs: the intention of this section is to establish your relationships with other staff in the Institute.

Relationship with CxOs

How important is it for you to interact with senior staff?

How do you think your role would be viewed by senior management in the Institute?

How is the ICT agenda set in your Institute?

How would you rate the digital literacy of the President?

How would you rate the digital literacy of the rest of the senior management team – do they understand IT?

Leadership required for the Five States: this section tries to identify which of the five states of maturity the Institute currently exists in and hence the type of role expected of the ITM

Five States Questions

How important is your contribution to maintaining accurate and up to date information for business and strategic purposes?

How important is use of information in your Institute?

How would you rate the information capabilities of your Institute?

How integrated is the use of information across your Institute?

2. The New CIO Leader, Broadbent and Kitzis

The New CIO Leader's Top Ten Priorities



Questions on the Leadership online survey

What were your impressions of the survey – did it apply to you? All sections?

Your strong points were xxx, could you please explain why you think that this is the case?

Your weak points were xxx, could you please explain why you think that this is the case?

Did you learn anything about your own role or leadership style by simply doing the survey?

3. KPIs, Mitra

This section attempts to discover what dimensions of ICT that stakeholders find important.

Performance and Value Metrics questions

In discussing suitable operations or IT performance metrics of existing IT for your department, which items would stakeholders be most likely to include?

In discussing suitable project metrics for your Institute, which items would stakeholders be most likely to include?

In deciding on measures to capture the impact of IT innovation on the Institute, which items would stakeholders be most likely to include?

What measures would you use to measure the performance of IT Services?

What measures, if any, would you use to measure the contribution of IT to business processes?

What measures, if any, would you use to measure the contribution of IT to a school or to the IoT?

How does the President and the rest of the senior management team assess the value of IT?

Communicating Value

How do you communicate the value provided by IT to other heads?

Do you know if metrics used for IT have changed in the last five years?

When the interview is over:

- Thank the interviewee
- Once again give assurance of confidentiality

Ask if it is okay to come back for clarification if necessary

Appendix E Comparison of the Five CIO Roles

Comparison of the Five CIO Roles					
	Utility IT Director	Evangelist CIO	Innovator CIO	Facilitator CIO	Agility IT Director/CIO
Scope of The Role	<ul style="list-style-type: none"> IT supply orientation. Reports to CFO Strong technical bias 	<ul style="list-style-type: none"> Changing mind-sets about information Identifying sources of competitive advantage. 	<ul style="list-style-type: none"> Delivering opportunities for securing advantage. Raising profile of the IT unit as a business partner 	<ul style="list-style-type: none"> Empowering and enabling the business with information capabilities Levering IT assets. 	<ul style="list-style-type: none"> Developing agile infrastructure. Coordinating organisational information and technology requirements
Issues Critical to Success	<ul style="list-style-type: none"> Maintaining service levels Ensuring the integrity of IT infrastructure 	<ul style="list-style-type: none"> Securing “face time” with CxOs. Maintaining existing IT performance levels. Attendance of CxOs at the IT steering committee 	<ul style="list-style-type: none"> Delivering meaningful business innovations. Securing business commitment for significant business change. Appointing demand managers. Being part of the strategy process. 	<ul style="list-style-type: none"> Encouraging information ownership by the business. Preparedness of the business to adopt new skills. Training and supporting capabilities to enable business innovation with IT 	<ul style="list-style-type: none"> Maintaining service levels. Identifying emerging technologies. Ensuring integrity and agility of technical architecture. Reading the technology marketplace. Guaranteeing security and privacy.
Performance Metrics	<ul style="list-style-type: none"> Cost Control. Service availability. Efficiency. On-time project delivery. 	<ul style="list-style-type: none"> Maintaining service levels. Number of “converts.” Securing availability of a small “piloting” budget. 	<ul style="list-style-type: none"> Value of innovations developed. Requests for additional service. 	<ul style="list-style-type: none"> Outstanding ROI from information. Achieving competitive advantage from information exploitation. 	<ul style="list-style-type: none"> Service availability. Customer/user satisfaction. Technology responsiveness.
Challenges	<ul style="list-style-type: none"> Securing budget. Gaining management attention. Stopping users’ DIY IT 	<ul style="list-style-type: none"> Understanding the business and the industry sector in detail. Securing “airtime” with senior executives. Establishing credibility with business colleagues. 	<ul style="list-style-type: none"> Ensuring continued investment in strategic opportunities. Limiting key operational and support applications. Gaining active governance of IT at board level. 	<ul style="list-style-type: none"> Managing migration of IT innovation into the business. Letting go. 	<ul style="list-style-type: none"> Staying at the cutting edge of technology. Managing intelligent and demanding users. Setting technical standards and policies. Speed of response.
Relationship with CxOs	<ul style="list-style-type: none"> Not necessary, as most interactions are with operational staff. 	<ul style="list-style-type: none"> Sporadic. Fighting for time with CxOs. 	<ul style="list-style-type: none"> Regular formal and informal meetings. Challenges valued by CxOs. 	<ul style="list-style-type: none"> Trusted partner. 	<ul style="list-style-type: none"> Advisor on policies and risks. Advisor on technical capabilities.

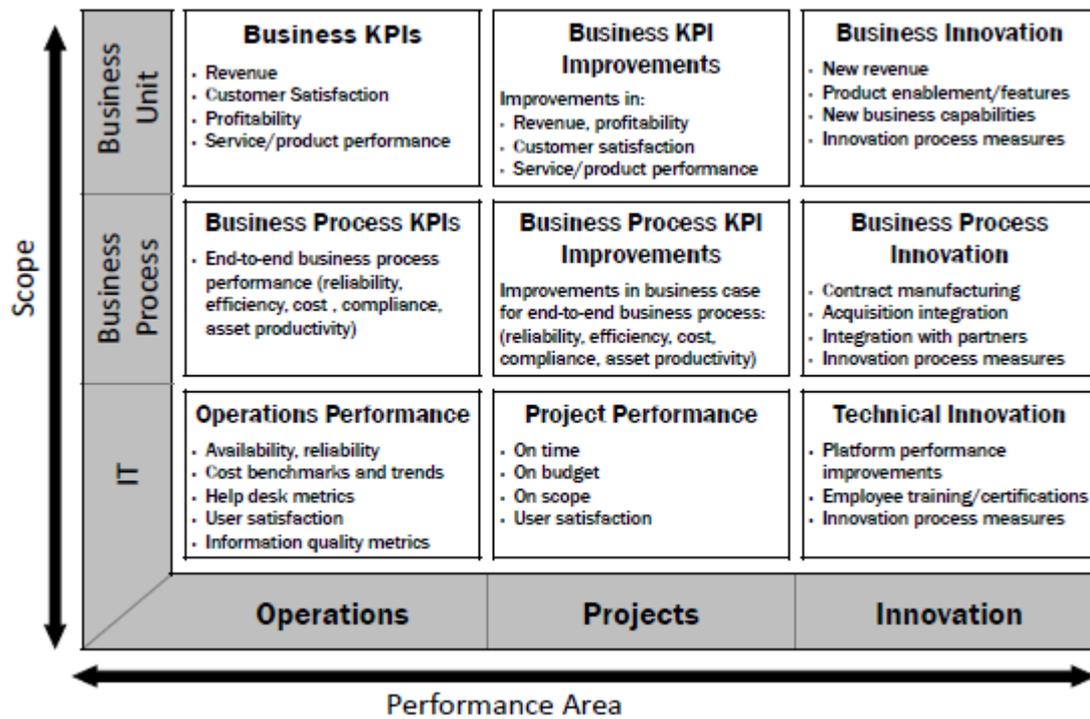
Comparison of the Five CIO Roles (Peppard *et al.*, 2011, p. 36)

Appendix F Peppard *et al.*, Five States

Comparison of the Five CIO Roles			
State	Criticality of Information and Technology for Differentiation	Assessment of Information Capabilities	Required Information Leadership Capability
A	Information is not currently used for differentiation	Information capabilities are currently low commensurate with organization needs.	Organizations typically need a <i>Utility IT Director</i> who makes (or is given little opportunity to make) a marginal contribution to the strategic application of information.
B	Examples exist of information usage contributing to competitive differentiation, but they are not widespread	Information capabilities in general are in need of improvement, but the need for this is not widely recognized	Organizations typically need an <i>Evangelist CIO</i> who can explain how information can be used for differentiation and can galvanize support.
C	Significant recognition of the high potential value of information exists across the organization	Information capabilities widely acknowledge to be in need of significant improvement.	Organizations typically need an <i>Innovator CIO</i> who actively exploits information to gain competitive advantage and to significantly enhance organizational information capabilities.
D	Information is used to provide competitive differentiation right across the industry; laggards suffer material disadvantage.	Information capabilities well developed with high level of acceptance and integration across the organization.	Organizations typically need a <i>Facilitator CIO</i> to work with business/department leaders to leverage the greatest possible advantage from information.
E	Information is at the heart of the industry and is treated as such.	Good information capabilities are pervasive across the organization, supported by an agile IT infrastructure.	Because information has become deeply embedded and integrated into every aspect of the organization-emerging technologies can now be orchestrated by an <i>Agility IT Director/CIO</i> .

The Five States Identify the Required Information Leadership Capabilities (Peppard *et al.*, 2011, p. 39)

Appendix G The Portfolio of Metrics



The Portfolio of Metrics (Mitra *et al.*, 2011, p. 49)

Appendix H Illustrative Quotes from Interviews

Scope of the Role

“When I started I wasn’t so much involved with strategy, with regards to planning activities, it was very much day to day firefighting activities. So the role has changed now where I very seldom get involved in the technical aspects of the job now which is the bit I most enjoy I have to say and I spend a significant portion of my time sitting in my office either on the phone, writing e-mails and I sometimes write reports.”

“Now the technology is absolutely firmly embedded, you don’t impress anybody by showing technology anymore, but where the real development is is in the whole information base, managing information and controlling it, putting in proper systems to deal with it and all that kind of stuff. So our role has gone much more from being the T side of the thing to the I, in my view, I think our role has become, I think our role always was but never recognised as being information, a CIO type of role but we were never put in that position in the organisation.”

“and I would have to say that to some extent, I’m guilty in that I tend to focus more on the technical side of what we do..... so really I should get more involved in those (business) areas”

“Business knowledge now. Certainly in early days you were seen as a techie, but that’s moved on a fair bit now.”

“The biggest issue, as I mentioned earlier, is culture. That there is an issue at the moment, where people are very resistant to change.”

“The academics are of the view that we would solely maintain the infrastructure and that our views with regards to the development of the infrastructure are inconsequential”

Issues Critical to Success

“The most important one of all is keeping daily operational services running, that pretty much sums up a lot of the job unfortunately.”

“Team management in terms of the technical support unit is incredibly important because it is acknowledged here in the Institute that nothing happens without technicians and IT support.”

“I’m beginning to see where I can be used in different areas and to go back maybe to the information and the knowledge management and I can see opportunities within the organisation for becoming more involved in those areas. Opportunities is probably the wrong word, it’s absolutely necessary if we want to progress....”

“I think that it is important but I would be very careful of the new technologies that I would be preparing for, you know, there are new technologies every day.”

“It’s important notionally and I’ll give you an example of this, because I lost staff I’d be very pragmatic about it and I would cut service levels very quickly if I don’t have the staff. I won’t put my staff under undue pressure to maintain service levels.”

Performance Metrics

“In terms of metrics, we really don’t have a whole pile”

“I was about to say feedback from management, but that really isn’t the case because by and large with a significant proportion of what we do, management don’t really care as long as people aren’t complaining to them, they don’t mind.”

“I suppose to maintain service level agreements that people are happy with, ourselves and our customers. I see our student population and staff as customers of our service”

“Once things are working and from the exec point of view, once they are not getting calls raised with them, that’s probably their biggest indicator. I do think though that exec in terms of direction probably should play a part in outlining in more detail what they want.”

“ROI again in our sphere of operation is a difficult one to quantify. When you are dealing in a profit and loss organisation return on investment is very simple. But we’re not dealing in that area.”

Challenges

“You can always say that you have some degree of difficulties alright because you are to some degree the front of something, you are pushing the boundaries of something all the time. In the point of view of the main body of people here you are pushing the boundary, pushing the boundary so there is that difficulty in it. So that’s a challenge, it’s enjoyable at times so calling it a difficulty, I’m not quite sure, a challenge might be more appropriate. There are no 2 days are the same in this job.”

“Yes, because the business is so wide and so varied and because, as I said earlier on, a personal shortcoming is that I focus on the technological side of the house rather than on the business side of the house”

“It is because our posts should be at the executive level, should be at CIO level so it is a very big problem for me, yes.”

“I enjoy the challenge of managing intelligent users who know what they want and can articulate it.”

“To a certain degree there would be certain challenges. The academics believe in academic freedom pretty much and that’s the most difficult environment to manage.”

Relationship with Senior Management

“It’s very important, it’s politics. I’m aware of the politics of the job, the politics of the job is sometimes more important than the operational bits.”

“There’s a bit of a double standard I think in that one. It’s probably the same for us all. You are seen as somebody who has key knowledge by being an IT person, and you are seen to some degree as being a super techie.”

“It would not be seen as part of their strategic senior management team because I’m not on the senior management team but it’s not seen as an operational tech

with a screwdriver either so it's something in between and different people would see it differently."

"They understand Facebook and social networking and all of that, but how to deliver it, using it and other technologies and stuff, they know what they want but they don't know how to deliver it or what technologies to get."

Importance of Information

"From our perspective from a BI perspective we will live and die by the quality of the information"

"the role has evolved now to become far more important about information than about technology"

"We don't necessarily decide what people want but if they come to us with what they want, then we provide it for them. That's what our role is."

"It's vital, but that's not to say that it is being used."

"It is underutilised and under integrated right now. I'd say that with the utmost respect and everyone has done as much as they could do but they're working in a very hamstrung environment in that we have a central core system that we can't really grow and do a lot with"

Online Survey Opinion

"I thought that it didn't relate to us at all. I really didn't."

"The whole idea of governance and strategies and is the IS organisation lean and focused, those types of areas really, some of the questions there you didn't know whether they applied to your sector or not or applied to industry and I left some blank so that's why in terms of governance there are low percentages."

"I suppose that I felt that it was more the CIO in business type of thing. I was looking at it and saying, yeah I scored low here but that's the environment we're in so I probably felt that it was more a generic CIO leader type thing than applicable to the public service"

"I thought that the survey was excellent because there were many areas that I was trying to focus on and considering and for it to be kind of mapped out in these 10 chapters I found very useful and very thought provoking"

Performance and Value Metrics

"Number 1 would be availability, that the systems are available. Number 2 is that they are fit for purpose, there's no point in having a thing that's missing 50% of the functionality if they need to do something, be it e-mail, be it timetabling, be it whatever, the system has to be fit for purpose."

"really what people are looking for from an IT project are; performance, quick resolution or being able to resolve a problem quickly if a problem arises and an understanding, even though they won't say it in these terms, understanding the

service level that has been delivered, in other words understanding what has been delivered”

“The end user, they have a new way of doing things, that’s fine but they don’t necessarily see that we drove it or that we delivered it at all.”

Communicating Value

“That is one of our weaknesses, without a shadow of a doubt. We have recognised that ourselves internally and we haven’t recognised how we are going to deal with it.”

“So whenever we implement or develop a new solution we bring it to the management team. The problem is that the management team really don’t care. If it doesn’t affect them directly they have absolutely no interest.”

“Sometimes the people who communicate our successes best are our end users”

“Yes, I think that the main metric is availability. Five years ago if something was unavailable they would nearly live without it, they’d go back to the chalk and talk, but now the fact that so much is IT based, you don’t have that luxury”

References

Broadbent, M. and Kitzis, E. (2004) *The new CIO leader: setting the agenda and delivering results*, Harvard Business Press.

Mitra, S., Sambamurthy, V. and Westerman, G. (2011) 'Measuring IT Performance and Communicating Value', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 47-59.

Peppard, J., Edwards, C. and Lambert, R. (2011) 'Clarifying the Ambiguous Role of the CIO', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 31-44.

Section 3

CONCLUSION AND RECOMMENDATIONS

Introduction

The topic under investigation in this study is the effectiveness of IT Managers (ITM) in the Institutes of Technology (IoT) in Ireland. The research set out to determine whether or not the current IT Management structures and roles in the IoTI sector remain relevant and effective to meet the challenges presented by the changes which have occurred in both technologies and the environment in which the IT Manager operates today. There are thirteen IoTs in Ireland, each of which has an IT Manager employed. The roles were established in the IoTI sector in the 1990s before the widespread adoption of the internet, e-mail or mobile phones but the structures today remain largely unchanged. Faced with the changes in technology and the changes in higher education globally and with proposed mergers and possible changes of focus of Institutes, it is important that the role of ITM be examined to maintain relevance for the position within the management team of higher education.

To determine effectiveness of ITMs this study develops an instrument to access the concept by combining the wisdom of three other works: “*Clarifying the Ambiguous Role of the CIO*” (Peppard *et al.*, 2011), “*The New CIO Leader*” (Broadbent and Kitzi, 2004) and “*Measuring IT Performance and Communicating Value*” (Mitra *et al.*, 2011). This enables the researcher to identify the part that ITMs play in the running of the Institutes by establishing the role of the ITMs, the areas where they are not currently adding value and by comparison with peers to grade the overall performance to highlight the areas where improvement efforts should be concentrated to get best returns.

Summary of Key Findings

At the time of inception of the ITM roles in the IoTI sector, the requirement was to introduce new technologies through the offices of a knowledgeable expert, who could install and maintain systems, on which the management and practice of teaching and learning might be improved; it was very much a supporting role. The findings of this study indicate that in spite of the proliferation of IT since the roles were established that ITMs in the IoTI sector still see themselves fulfilling the role of chief technologist with a portfolio that includes; change management, technology approver, mentor, visionary and super technician. There is also a very active community of practice evident in the sector at the current time.

The scope of the ITM role in the Institutes and the role that the Institutes want them to play is one which is strongly influenced by the supply and maintenance of IT services as opposed to strategy formulation, business development, information management or innovation. The role

does not have a natural reporting structure into the SMT as half the incumbents report to the Registrar and half to the Secretary/Financial Controller. This ambiguous reporting structure can affect the strategic direction that the ITM finds himself being pulled in; academic support, financial or development. However if the ITM were to report directly into the President (CEO) of the Institute who by virtue of being at the apex of the organisation hierarchy has a more overall view of strategy (Mintzberg, 1990), the ITM would be better placed to contribute to Institute strategy (David S Preston *et al.*, 2008; Johnson and Lederer, 2010). Reporting directly to the President or being part of the senior management team (SMT) was one of the findings most cited by ITMs themselves as likely to improve effectiveness. The challenge for the ITM if elevated to the SMT would be to establish themselves as representing a core activity and not just a support function. Recent studies have shown that where CIOs are elevated to the SMT that it can have a positive effect on firm performance (Hodgson and Lane, 2010; Nkwe, 2013; Hu *et al.*, 2014), the test for ITMs in education therefore is to demonstrate that they have the ability and the potential to be major contributors to overall Institute strategy.

One mechanism for doing this is to concentrate on the risk associated with the reported poor IT governance in the sector; in *“The New CIO Leader”* (Broadbent and Kitzi, 2004), the authors point out the responsibilities of “new CIO leaders” to raise concerns of poor governance to the point that it becomes a shared issue amongst the SMT. From the findings it is clear that the ITMs are already looking after the daily supply of IT services and that they are trusted to do this but that IT governance is a problem which is broader than supply of IT services; it also concerns performance and transformation of IT to meet the current and future demands of the organisation. Examples exist of how to improve IT performance through improving IT governance (De Haes and Van Grembergen, 2004; Weill and Ross, 2004; Van Grembergen and De Haes, 2005; Khatri and Brown, 2010) all of which involve increased contact with peers and superiors. The opposite of improving IT governance is to allow it to stagnate or by default to descend into anarchy, which is itself a form of governance but which has not been shown to increase either ITM effectiveness or Institute performance.

Issues critical to ITMs include: maintaining service levels, identifying emerging technologies, ensuring integrity and agility of technical architecture, reading the technology marketplace and guaranteeing security and privacy. There were no indications that there was any value placed on innovations developed by ITMs or their departments and no sense of operating in a competitive environment. There was broad agreement that funding for technology in the sector is a problem and other pressures on delivering services along with poor governance include: inability to replace staff who leave and IT maturity of the senior staff in the Institutes. To address the challenges reported by the ITMs there was a common thread of recommending that the post be upgraded to become a member of the SMT as a possible solution. All ITMs agreed that interaction with SMT was important but that full membership would be preferred as too many members of current SMTs considered the ITMs to be no more than chief technicians with no

strategic role to play in the running of the Institutes. This study found that ITMs did wish to make a more strategic contribution to the Institutes.

For performance metrics there were no mentions of increasing revenue or other revenue generating activities or profitability. Performance metrics tended to concentrate on areas of operations where maintaining service levels was paramount. Delivering projects were also mentioned as indicators of success. By concentrating on these types of metrics the ITMs can be categorised as not adding a lot of strategic value to the business of the Institutes; they are a cost centre providing an essential service.

From the position of the role of ITM as middle managers in the sector and due to the relative newness of the position and the ambiguous reporting relationship it is clear that the ITMs in the sector could not be considered as a traditional power base in the Institutes. However due to increased dependence on technology and greater auditing and regulation the ITMs have the capacity to play a more critical role in the strategy and change process of the Institutes (Broadbent and Kitzis, 2004; Braganza and Franken, 2007; Hawkins, 2008; Banker *et al.*, 2011). It has been reported that higher education, just like many other industries, is changing due to technology (Bates, 2003; Slaughter, 2004; Fry *et al.*, 2008), however the rate of change has been questioned and embedded teaching practices and culture have been reported to be resistant to change with the emergence of a digital disconnect (Blin and Munro, 2008) in the classroom. This was confirmed in the interviews with ITMs where a picture emerges of the sector as a largely conservative one that is resistant to change. Technology itself was not reported as a problem but what surfaces is the challenge of leading and managing change. This type of change is not unique to the IoTI sector, it is a more global phenomenon and one in which the ITM is at the core of, because it is technology-driven change. *“It involves massive cultural change in the way we think about what we do and how we do it”* (Raths, 2014, p. 19). Thus it is no longer enough for effective ITMs to concentrate solely on technology and expect to win over people with discussions based on technology alone, ITMs need to become specialists in change management to ensure the success of IT initiatives.

During the interviews, ITMs identified a divide between academic staff and departments and the IT support functions in the Institutes. This was often accounted for because of the need of the ITM to have a more global view of the Institutes rather than a more parochial one that could be found in individual departments. If ITMs are to become successful managers of change through the introduction of new or disruptive technologies they will have to be aware of this divide and not to overlook the impact that it can have on change. This requires ITMs to veer towards facilitating change rather than being formal leaders of change in the Institutes (Earl and Feeny, 2012). The importance of measuring performance and communicating value in terms that stakeholders rate is emphasised once again and one which the ITMs need to pay more attention to.

One aspect of IT that could benefit from change and in the process improve how the effects of IT are measured and communicated is the cost of IT. “*Higher education has never fully addressed how to measure costs, let alone how to ascribe spending to outcomes, necessary to measure productivity*” (Wellman, 2010, p. 5). This is one area of change where ITMs will have to work closely with academic departments and Finance to ensure meaningful measures are agreed as even if ITMs improve performance and introduce change; they may get no credit for their efforts unless there are prior meaningful measures in place before any change is attempted.

Contribution to Theory

This study set out to measure current effectiveness of IT management in the IoTI sector and to suggest appropriate areas for improvement. The study started by developing a method of measuring effectiveness by combining the online survey with follow-on interviews to triangulate the findings of the surveys and to get a richer insight into the current state of IT management in the IoTI sector. The study was based on three previous works: Broadbent and Kitzis (2004), Mitra *et al.*, (2011) and Peppard *et al.*, (2011). These works were scrutinised to extract the essence of what impacts on ITM effectiveness and to develop the interview guide to measure it. The initial findings of the study were brought back to the group of participating ITMs for validation whereupon the findings were unanimously accepted. This suggests a certain validation of the instrument used also which if repeated in other studies could go on to establish an accepted instrument to assess ITM effectiveness. The instrument could also be further refined by making it less general and more specific to various sectors. For example, questions relating to shareholder value or profitability could be rephrased to have greater appeal to the public sector where these concepts might not resonate. In spite of agreeing with the findings, this was the major criticism that ITMs had of the survey.

There have been several attempts at defining and measuring ITM or CIO effectiveness in organisations (Gottschalk and Taylor, 2000; Brown, 2006; Smaltz *et al.*, 2006; Iyengar, 2007; Lineman, 2007; D.S. Preston *et al.*, 2008a; Peppard, 2010b; Mitra *et al.*, 2011; Vreuls and Joia, 2011) but as yet there is no recognised standard by which to accurately assess it. Previous efforts have concentrated on looking at characteristics of ITMs or the outputs expected from ITMs or unique challenges faced by ITMs and discussing how to maximise effectiveness through these lenses. What this study does is to build on previous works on ITM effectiveness and to recognise the importance of rating ITMs against peers to discover whether there are deficiencies against international practitioners and what areas they might be in. It builds on this information to examine the roles that the ITMs are currently fulfilling in organisations with the understanding that even the most accomplished of ITMs can only operate to the level that the organisation will allow or expect him/her to operate at. It confirms the role that the ITM operates at by discovering the key performance indicators used by ITMs and examining their communication strategies. This all combines to deliver a unique assessment of ITM effectiveness and establishes an instrument to measure effectiveness through the combination of online survey and interview guide.

In terms of theory, it can be categorised as a theory for analysing which is more concerned with describing the current status of a concept rather than trying to predict or discover causality (Gregor, 2006). By more clearly identifying that ITMs can work on aspects of their individual leadership abilities to affect improvements in ITM effectiveness in an organisation which is dependent on organisational variables such as IT maturity of senior management this study contributes to the “*delineation of constructs and their associated measures*” (Gregor, 2006, p. 623).

Contribution to Practice

The findings of this study confirm an ITM at middle management layer in the IoTI sector but fulfilling a role that is ambiguous. The sector itself is unclear as to what role it wants the ITMs to play and there is an array of roles that the ITM could play from Utility IT Director to Agility IT Director/CIO (Peppard *et al.*, 2011) and there is a portfolio of metrics that can be used to measure IT performance (Mitra *et al.*, 2011). The findings of this study advance the impression of a post where incumbents are hindered in becoming more effective due to deficiencies in IT governance and IT maturity of the Institutes which ensures that the role remains at the middle management layer of the organisation while many feel that it could benefit from a promotion to senior management layer. A sector wide discussion at senior management level needs to address this issue if a clear and unambiguous role for ITMs is to be carved out. This conversation can only happen when questions about governance and IT maturity have taken place.

The study does confirm that while technical ability is indeed a requirement for the job increasingly it is not the most important requirement. As technology becomes more embedded in the Institutes the emphasis for an ITM is to lead the way forward with greater use of information for strategic purposes. The ITM will still have to manage the deployment of technology but will also need to understand the business of the Institutes more in order to get better value out of the data that they already hold. To this end the ITMs may find that they are managing less and less technology on campus as they develop more facilities remote to the Institutes or in the cloud. This will also change the focus of ITMs who up to recently purchased equipment and managed local resources to ensure local services ran on that equipment. With more services migrating to the cloud the ITMs will have to develop the ability to manage these services in locations remote or unknown to the campus. This will have implications for future recruitment and retention of ITMs to the sector; in the past it may have been superior technical skills that were sought out while recruiting an ITM, this will need to change for the future development of the role to include more strategic responsibilities and abilities to manage change. To this end minimum requirements, which currently emphasise the technical ability of the candidates, might be expanded to include general business administration or strategy development skills and future training and development needs of the current ITMs should include such non-technical topics too.

Limitations

While the study did find a method of assessing ITM effectiveness, it depended largely on the results of online surveys and interviews with current ITMs as the major source of data. This leaves the study open to criticism of possibly suffering from group think or not having enough balance. It was uncovered during the research that there is an active community of practice functioning in the sector which might have resulted in the emergence of a sector wide single ITM view of the world. To alleviate this opinions of peers, superiors and subordinates could be sought to confirm or otherwise the views of the ITMs to their roles and to their assessments of governance and IT maturity. This would require access to a wider community of staff in the Institutes and would benefit from a team of researchers as opposed to a lone researcher.

Conclusions

ITMs in the IoTI sector continue to have a major role to play in providing essential services to the Institutes. This in spite of the challenges and hurdles expressed throughout the interviews. The principal of elevating the IT function to a more senior role to get over hurdles is gaining traction nationally with the appointment in May 2013 of a CIO to the Irish government. If central government sees the wisdom of having a CIO backed up by a CIO council¹⁶ reporting directly to government, state bodies such as Institutes of Technology might be inclined to follow suit. This reflects what has been happening in global corporations for some time now with the CIO's position in the corporate structure *“rising steadily and inexorably from the tactical/operational level to the strategic/management level”* (Polansky *et al.*, 2004, p. 29). Increasingly good governance is seen as less and less of an ideal, rather since the introduction of the Sarbanes Oxley Act¹⁷ in the United States in 2002 to address a number of major corporate public accounting scandals, it is seen as a legal requirement (Brown and Nasuti, 2005; Kaarst-Brown and Kelly, 2005; Romano, 2005; Sutton and Arnold, 2005). However the realities of corporate and academic worlds are not always in synch with each other and academic institutions can find it hard to change to effective IT governance due to long standing culture issues or unclear enterprise goals (NASCIO, 2008). It is possible that *“IT governance will continue to focus on the institution's IT investment strategy and priorities but will increasingly focus on how the institution wishes to manifest itself online”* (Katz, 2008, p. 23).

Any elevation of ITMs would improve their position to exert influence on overall Institute strategy. As with any managerial post, there comes with it a certain amount of formal authority and the more senior the post the more formal the authority that comes with it. However formal authority will only go so far in increasing effectiveness and exerting influence, and it generally flows down the organisation to subordinates anyway, the real effectiveness is to be derived from *“crafting cross-functional, peer-based relationships”* (Harvey G Enns *et al.*, 2007). In any hierarchy, the people at the top depend on advice from the people around them and as the ITMs

¹⁶ For further information please go to <http://www.gov.ie/services/cio-council/>

¹⁷ For further information please go to <https://www.sec.gov/about/laws/soa2002.pdf>

begin to work more closely with the SMTs their influence will grow. The influence strategy used by the ITM will then become important. There are various types of broad behaviours that ITMs can adopt to increase influence: task behaviours, relations behaviours and change-orientated behaviours (Yukl *et al.*, 2002). Effective ITMs foster good relations at SMT, they also pre-sell their ideas by discussing them informally with peers before proposing them, however the most effective ITMs “*tailor their influence behaviors to individual executives on the top management team*” (Harvey G Enns *et al.*, 2007, p. 32). As with the findings on building an effective IS team in the survey, which requires inter alia high emotional intelligence, the ability to influence peers and superiors requires good emotional intelligence too. For this reason it is unlikely that an ITM who continues to hone their technical skills at the expense of the “softer” emotional skills required of effective managers will ever make it to Agility CIO. The findings indicate the current incumbents of the role already possess the awareness of the importance of those around them as evidenced in the constant mention of the importance of their teams. If ITMs were to make the progression onto the SMT, there is nothing to suggest that this importance of team attainment would not be just as significant.

Recommendations

The first step in increasing ITM effectiveness in the sector is to become more central to the core business. By establishing regular communications with the SMT tactics such as rational persuasion, legitimating, inspirational appeal and coalition behaviours have been shown to work successfully for ITMs (Holmes, 2006; Harvey G Enns *et al.*, 2007). Improving communications with the SMT would address one of the areas; the IoTI ITMs were rated at Innovator CIO level during the interviews which meant that there is room for improvement. While ITMs need to use their expert knowledge of IT they need to adapt the technical jargon that normally goes with the subject matter to persuade peers and superiors of the legitimacy of greater involvement of IT in core business matters (Liu *et al.*, 2013). One way to do this could be to persuade the SMT to adopt a more formal set of measures to assess the impact of IT on the Institutes. By agreeing this in the language of the SMT or Governing Body the ITMs will ensure that they have a mechanism for managing the expectations of what IT can and should be delivering in the Institutes. They would also address the poorest scoring section of the interviews; Performance Metrics and elevate that rating from the current Evangelist CIO level to a higher rating. Currently the unanimous view of the ITMs is that there is no formal measure in place to assess the contribution that IT makes to the Institutes and that the only interest the SMT takes in IT is when things go wrong and staff or students start to complain.

There were no mentions of other formal measures in place to assess the contribution of any other departments in the Institutes either. While not asked directly about these the opportunity presented to mention them by way of comparison measures if they had existed. As formal measures are developed to assess the contribution of IT to the Institutes the ITMs themselves may be able to extend the development of assessment measures or key performance indicators (KPIs) to include other sections of the Institute which currently may have a similar lack of

measures. This could well turn out to be one of the first contributions to overall Institute performance that the ITMs could make.

As one of the key advantages of implementing management information systems (MIS) is to improve the performance of organisations (March and Storey, 2008; Nudurupati *et al.*, 2011) ITMs would be in a prime position to be involved in determining the structure of performance measures for other departments. Having gone through the process themselves and being the custodians of MIS on which the measures will be recorded extends the influence of the ITMs in the organisation. This further ties in with the recommendations made by Broadbent and Kitzis (2004) for the “new CIO Leader” to develop high performance IS teams. So as the ITMs work at increasing their influence through greater involvement at SMT level and improve IT governance in the Institutes they must also look after the technical side of the jobs by developing relevant information systems. This in itself would address one of the other inhibitors to greater ITM effectiveness that was regularly mentioned in the interviews; the selection of management information systems by members of the SMT without reference to any technical expertise at ITM level.

The fact that senior, non-technical, managers would see fit to select technical information systems without input from ITMs in itself points to low levels of IT maturity in the sector. Peppard *et al.*, (2011) describe the level of IT maturity in an organisation at SMT level as one of the greatest impediments to improving ITM effectiveness. Comparison with the CIO metrics portfolio of Mitra *et al.*, (2011) confirms that across the sector that ITMs are operating almost exclusively at the operations and projects levels of metrics and only at the IT and Business Process levels of the Institutes. This leaves room to improve effectiveness by expanding into areas of greater innovation and into Business Units of the organisation.

Innovation

Where innovation was mentioned in the Mitra *et al.*, (2011) study as an important indicator as to what level the ITM was operating at, it made reference to things such as: revenue, profitability, product enablement/features, contract manufacturing etc. none of which the ITMs could relate to in the IoTI sector in the current configuration. The focus in the IoTI sector tends to centre on the academic cycle with its currency measured in student numbers and academic programmes rather than on economic ones with the emphasis on profit or shareholder value. From the interviews with ITMs it is clear that technology innovation or investments are far more likely to be described in terms of the technology itself rather than in value terms that mean something to the stakeholders in the Institutes. To become more effective ITMs need to concentrate their efforts on communicating in terms of business outcomes and not in terms of technology itself as a “*business case will never be made for an application, a database, a technology service, or any other pure technology*” (NASCIO, 2008, p. 4). This suggests dispensing with IT strategies in favour of ensuring that IT requirements become an integral component of business strategy. The ITM brings little of value to business strategy by discussing

how IT could be used, rather the value is to be added by discussing how IT should be used (Earl and Feeny, 2012).

If this approach to strategy can be adopted then the conversation changes from what technology will do to the Institutes or to education to how the Institutes will choose to use technology. This is a different type of conversation where the ITM needs to be at the heart of business decisions rather than, as they currently often are, brought in after major decisions have been made in order to make things work. To do this ITMs need to be able to persuade the Presidents of the Institutes and the wider SMTs that future IT projects are measured against strategic criteria by asking how any new project supports any business strategy rather than, as normally happens, concentrating on cost reduction or some other such measure (Carter *et al.*, 2011; Earl and Feeny, 2012; Guillemette and Paré, 2012). This should improve the poor showing found during the interviews to questions on communicating value based on both the (Peppard *et al.*, 2011) and (Mitra *et al.*, 2011) studies.

Another aspect to innovation which was not specifically touched on during the interviews but which was followed up subsequently is the topic of revenue and product. At a very high level the products of higher education can be described as the outputs from either: teaching and learning activities or of research. Many studies support the idea that higher education, and in particular teaching and research, is increasingly becoming a product and subject to the vagaries of the marketplace (Brown and Lauder, 1996; Pratt and Poole, 2000; Meyer, 2002; Cheng, 2004; Slaughter, 2004; Schofer and Meyer, 2005; Altbach and Knight, 2007; Marginson, 2010). Accepting that this is the case allows for the narrowing of the gap between the potential for IT to affect the profitability of a corporation or an institute of higher education by establishing closer links between IT services and teaching and research activities.

All Institutes in the IoTI sector have some form of online module or program delivery mechanism through the deployment of a virtual learning environment (VLE) which depends on stable IT infrastructure to exist. In many of the Institutes the pattern has been to establish the VLE through the offices of the ITM. However once established it is often the case that ITMs dwindle to performing no more than a supporting role for the hardware and responsibility for the future direction of online activity is handed over to another new or existing department. This effectively takes away from ITMs the potential to influence future revenue streams as by only performing a supporting role the ITM is one step removed from revenue generation through offering online courses. By campaigning to stay more closely involved strategically with future development of VLEs, the ITM would enhance their potential to affect the revenue of the Institutes and move further into the innovation space of the Mitra *et al.*, (2011) innovation metrics and also to move further up the rankings in the Peppard *et al.*, (2011) scope of the role and performance metrics criteria.

The other aspect of teaching to be affected by technology is the changing environment presented by the ability to store data in a digital format. “*There is no question that information*

technology, networks, and the onslaught of digital data are changing the way we can do teaching, learning, and research in absolutely fundamental ways” (Lynch, 2008, p. 43). Once again it is incumbent on ITMs who wish to improve effectiveness to stay close to all developments in the digital storage and retrieval spheres to drive these technologies to meet the demands of the Institutes. As “*digital media and broadband networks continue to change the form and amount of knowledge institutions can store and share, as well as who they can share them with*” (Hawkins 2008 p. 10), there should be greater opportunity for ITMs to contribute. Learning from the current experience with VLEs where ITMs become relegated to support players once the chosen VLE is up and running, ITMs need to remain alert for opportunities in the continually developing digital media field to be more effective.

The other high level product of higher education, and one which has great potential to attract funding, is research. Various attempts have been made to establish a correlation between greater research activity and better teaching practices (Linsky and Straus, 1975; Feldman, 1987; Neumann, 1992; Ramsden and Moses, 1992) but without much success. This suggests that ITMs should treat them differently too. Research tends to concentrate around individual researchers or research centres which place different types of demands on IT services. Where teaching activities are prescribed through approved modules or courses and from a technology point of view require a stable environment to operate in, research tends to be unfettered and require a much more open ended type of support. Also it is quite common that researchers are working on patented material which may require a high level of security around the permitted access to data unlike the more collegiate and free distribution of information found in support of teaching activities. During the interviews the ITMs described the teaching practices in the sector as being quite conservative and slow to change. However as the *raison d’etre* of much of the funded research activity in the Institutes is precisely to come up with new ideas and products and as a result to effect change, ITMs who are interested in becoming more effective should keep in close touch with researchers and ensure that they are the first port of call when it comes to either providing, brokering or advising on IT services. The alternative is that ITMs will become sidelined and less relevant as researchers and other corporate partnership initiatives look outwards to cloud service providers for services that once might have been supplied by internal IT departments. Research and cloud activities when coupled together can provide end users with much more choice than before and transform users into choosers thus outsourcing a once important service and in the process reducing the influence of the local ITM.

Business Units

Working with business units in the Institutes was the other layer of activity in the Mitra *et al.*, (2011) study where IoTI ITMs showed a poor response and therefore had potential to improve. During the interviews there were three questions asked concerning: the importance to the Institute of the business knowledge of the ITMs, whether the ITMs considered understanding the business of the Institutes to be a challenge and how the ITMs would measure their contribution to the business processes of the Institutes. It is clear from the responses that, at

best, there is a 50/50 split between the group on whether they considered the Institutes placed any value at all on their knowledge of the business, or that they even fully understood the business of the Institutes and the only common thread of how their contribution to the business processes of the Institutes might be measured was to mention maintaining a service or response to service calls. Further when discussing challenges with applying common policies and standards the ITMs reported that on account of having to apply these standards that some of the academic departments, or business units, would consider the ITMs to be inhibitors to progress rather than partners or leaders. This suggests that there is value in the ITMs spending time with the departments to create a shared vision of the role of IT to position themselves as agents of business transformation rather than inhibitors to progress. To begin with the ITM may secure support from the President or one or two other executive members but in the longer term a shared vision of IT needs to be developed across the entire SMT (Earl and Feeny, 2012). This requires effort on behalf of the ITMs to maintain channels of communications to all members of the SMT and to actively canvas their support for initiatives.

While canvassing support the ITMs would benefit from accepting that while they may be experts in the field of IT that they are not experts in all business areas across the Institutes and that when they are discussing initiatives with members of the SMT or other middle managers that they are actually talking with the local experts who will have better insights into their own areas of operations than the ITM could be expected to have. It is the job of the ITM to demystify the technology and to enlighten colleagues as to how they might make better use of information and technology. However deference to superior knowledge in any given area does not suggest yielding to everything that a department wants or suggests as it must also be remembered that the ITM gets a view across the entire business and as a result is better placed to form a more global view of what is required for the Institutes (Earl and Feeny, 2012). The alternative is to attempt to satisfy everyone while not really satisfying anyone. While developing closer relations with the business units the ITMs must also not forget the importance of maintaining stable networks and systems as it is only when the minimal requirements are met, that “*the IT function is in a good position to add value to the organization*” (Guillemette and Paré, 2012, p. 538). The clients must first be satisfied with the basics before the ITMs can progress to adding value.

Innovation and contribution to revenue or product enhancement have already been mentioned as areas in which the ITMs can become more involved so when discussing business requirements with units in the Institutes the ITMs need to be alert for opportunities to make enhanced use of information. The ITMs are already the custodians of the technology that holds the corporate data of the Institutes but responses to the interviews clearly indicated that the Institutes had low expectations of what they could do with the data that they already had. In response to the lack of demand for greater use of the data ITMs were, by and large, content to simply ensure the security of the data and the reliability of the infrastructure that holds the data. This is where the ITMs have an opportunity to add value; by concentrating on what can and should be done with the data rather than how to store it, the ITMs begin to add value; “*It's not about how we hold the data, it's what we do with it*” (Taylor, 2014). This suggests a re-

balancing of the I and the T in information technology (Raths, 2014). As one of the ITMs put it during the interviews that it *“goes back to the I in the IT thing again, the role has evolved now to become far more important about information than about technology.”* It seems that the ITM who expressed this might already be on the track to adding greater value to his Institute and that some of the other ITMs in the sector would do well to follow his lead.

Further Research

The findings of this study indicate that there are areas of responsibility of an ITM which can be used to measure effectiveness. The conceptual model used to assess the current effectiveness of ITMs in the IoTI sector demonstrates that it is possible to place the roles on a continuum of effectiveness and to determine the areas of the organisation where the ITMs make their greatest contribution. This model could benefit from further research to validate the instrument for wider use and to explore whether or not it needs to be customised for various sectors. Further validation would require interviewing a wider section of the organisations' community to uncover alternative views to those of the ITMs. Further research could also be conducted into the possibility of transferring the entire survey into an online instrument for self-administration.

This research set out to determine whether or not the current IT Management structures and roles in the IoTI sector remain relevant and effective to meet the challenges presented by the changes which have occurred in both technologies and the environment in which the IT Manager operates today. In the process of doing this an instrument for ITM effectiveness was developed which could be further developed and refined. It is clear that ITMs in the IoTI sector are working in a challenging environment; budget constraints, position in the hierarchy, governance and IT maturity issues coupled with operating in a largely conservative environment while being relied on to introduce change and new technologies combine to ensure an exacting workload. ITMs appear to have an appetite to continue to strive to make a difference in the Institutes and look forward to a day when they can make a more strategic contribution to the sector. To this end there are certain actions that they can take themselves to ensure that the IT agenda and the Institutes' agendas function in harmony to deliver better services and technologies to the sector.

References

- Abdoli Sejzi, A., Aris, B. and Yahaya, N. (2011) 'Virtual University And Globalisation', *Journal of edupres*, Vol. 1, pp. 35-41.
- Altbach, P. G. and Knight, J. (2007) 'The internationalization of higher education: Motivations and realities', *Journal of Studies in International Education*, Vol. 11, No. 3-4, pp. 290-305.
- Atherton, A. and Elsmore, P. (2007) 'Structuring qualitative enquiry in management and organization research: a dialogue on the merits of using software for qualitative data analysis', *Qualitative research in organizations and management: An International Journal*, Vol. 2, No. 1, pp. 62-77.
- Bakhtiari, S. and Shajar, H. (2011) 'Globalization and Education: Challenges and opportunities', *International Business & Economics Research Journal (IBER)*, Vol. 5, No. 2.
- Banker, R. D., Hu, N., Pavlou, P. A. and Luftman, J. (2011) 'CIO reporting structure, strategic positioning, and firm performance', *MIS quarterly*, Vol. 35, No. 2, pp. 487-504.
- Bassellier, G., Reich, B. H. and Benbasat, I. (2001) 'Information technology competence of business managers: A definition and research model', *Journal of Management Information Systems*, Vol. 17, No. 4, pp. 159-182.
- Bates, A. T. (2003) *Managing technological change*, Jossey-Bass.
- Baxter, P. and Jack, S. (2008) 'Qualitative case study methodology: Study design and implementation for novice researchers', *The Qualitative Report*, Vol. 13, No. 4, pp. 544-559.
- Bazeley, P. and Jackson, K. (2013) *Qualitative data analysis with NVivo*, Sage Publications Limited.
- Becker, N. J. (1999) *Implementing technology in higher education: The leadership role and perspectives of the chief information officer*, Thesis, Teachers College, Columbia University.
- Bedeian, A. G. and Wren, D. A. (2001) 'Most influential management books of the 20th century', *Organizational Dynamics*, Vol. 29, No. 3, pp. 221-225.
- Benbasat, I., Goldstein, D. K. and Mead, M. (1987) 'The Case Research Strategy in Studies of Information Systems', *MIS quarterly*, pp. 369 - 386.
- Benbasat, I. and Zmud, R. W. (1999) 'Empirical research in information systems: the practice of relevance', *MIS quarterly*, pp. 3-16.
- Benson, P. G., Saraph, J. V. and Schroeder, R. G. (1991) 'The effects of organizational context on quality management: an empirical investigation', *Management science*, pp. 1107-1124.
- Berger, P. and Luckmann, T. (1992) 'The social construction of reality', NY-1966.

- Bharadwaj, A. S. (2000) 'A resource-based perspective on information technology capability and firm performance: an empirical investigation', *MIS quarterly*, pp. 169-196.
- Bharadwaj, A. S., Bharadwaj, S. G. and Konsynski, B. R. (1999) 'Information technology effects on firm performance as measured by Tobin's q', *Management science*, Vol. 45, No. 7, pp. 1008-1024.
- Blaikie, N. (2009) *Designing social research*, Polity.
- Blanchard, K. H., Zigarmi, P., Zigarmi, D. and Blanchard, K. (1985) *Leadership and the one minute manager: Increasing effectiveness through situational leadership*, Morrow New York.
- Blin, F. and Munro, M. (2008) 'Why hasn't technology disrupted academics' teaching practices? Understanding resistance to change through the lens of activity theory', *Computers & Education*, Vol. 50, No. 2, pp. 475-490.
- Bolman, L. G. and Deal, T. E. (1991) 'Leadership and management effectiveness: A multi-frame, multi-sector analysis', *Human Resource Management*, Vol. 30, No. 4, pp. 509-534.
- Braganza, A. and Franken, A. (2007) 'SOX, compliance, and power relationships', *Communications of the ACM*, Vol. 50, No. 9, pp. 97-102.
- Brannen, J. (2005) 'Mixing methods: The entry of qualitative and quantitative approaches into the research process', *International Journal of Social Research Methodology*, Vol. 8, No. 3, pp. 173-184.
- Brannen, J. and Coram, T. (1992) *Mixing methods: Qualitative and quantitative research*, Avebury Aldershot.
- Broadbent, M. and Kitzis, E. (2004) *The new CIO leader: setting the agenda and delivering results*, Harvard Business Press.
- Brown, P. and Lauder, H. (1996) 'Education, globalization and economic development', *Journal of Education Policy*, Vol. 11, No. 1, pp. 1-25.
- Brown, W. and Nasuti, F. (2005) 'Sarbanes-Oxley and enterprise security: IT governance-what it takes to get the job done', *Information Systems Security*, Vol. 14, No. 5, pp. 15-28.
- Brown, W. A. (2006) 'CIO Effectiveness in Higher Education', *Educause Quarterly*, Vol. 29, No. 1, pp. 6.
- Brunsson, K. H. (2008) 'Some effects of Fayolism', *International Studies of Management and Organization*, Vol. 38, No. 1, pp. 30-47.
- Bryman, A. (2004) *Social Research Methods*, Second Edition Edn. OUP Oxford.

- Bryman, A. (2006) 'Integrating quantitative and qualitative research: how is it done?', *Qualitative research*, Vol. 6, No. 1, pp. 97-113.
- Bryman, A. and Burgess, B. (2002) *Analyzing qualitative data*, Routledge.
- Brynjolfsson, E. and Hitt, L. M. (2000) 'Beyond computation: Information technology, organizational transformation and business performance', *The Journal of Economic Perspectives*, pp. 23-48.
- Bryson, J. M., Crosby, B. C. and Stone, M. M. (2006) 'The Design and Implementation of Cross-Sector Collaborations: Propositions from the Literature', *Public Administration Review*, Vol. 66, No. s1, pp. 44-55.
- Burr, V. (1998) 'Overview: Realism, relativism, social constructionism and discourse', *Social constructionism, discourse and realism*, pp. 13-26.
- Burrell, G. and Morgan, G. (1979) 'Morgan. G. Sociological Paradigms and Organizational Analysis',
- Carlson, S. (1951) *Executive behaviour: a study of the work load and the working methods of managing directors*, Arno Press.
- Carnevale, D. G. (1995) *Trustworthy government: Leadership and management strategies for building trust and high performance*, Jossey-Bass Publishers San Francisco, CA.
- Carroll, S. J. and Gillen, D. J. (1987) 'Are the classical management functions useful in describing managerial work?', *Academy of management review*, pp. 38-51.
- Carter, M., Grover, V. and Thatcher, J. B. (2011) 'The emerging CIO role of business technology strategist', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 19-29
- Cartwright, G. (2002) 'Today's CIO: Leader, Manager, and Member of the " Executive Orchestra"', *Educause Review*, Vol. 37, pp. 6-7.
- Chan, A. (2001) *Critically constituting organization*, John Benjamins Publishing.
- Chen, D. Q., Mocker, M., Preston, D. S. and Teubner, A. (2010) 'Information systems strategy: reconceptualization, measurement, and implications', *MIS quarterly*, Vol. 34, No. 2, pp. 233-259.
- Chen, Y. and Zhu, J. (2004) 'Measuring Information Technology's Indirect Impact on Firm Performance', *Information Technology and Management*, Vol. 5, No. 1, pp. 9-22.
- Cheng, Y. C. (2004) 'Fostering local knowledge and human development in globalization of education', *International Journal of Educational Management*, Vol. 18, No. 1, pp. 7-24.

- Chester, T. M. (2006) 'A roadmap for IT leadership and the next ten years', *Educause Quarterly*, Vol. 29, No. 2, pp. 56.
- Chia, R. C. and Chia, R. K. G. (1996) *Organizational analysis as deconstructive practice*, Walter de Gruyter.
- Chun, M. and Mooney, J. (2009) 'CIO roles and responsibilities: Twenty-five years of evolution and change', *Information & Management*, Vol. 46, No. 6, pp. 323-334.
- Clancy, P. (2008) 'The non-university sector in Irish higher education', *Non-university higher education in Europe*, pp. 123-145.
- Collis, J. and Hussey, R. (2009) *Business research: A practical guide for undergraduate and postgraduate students*, Palgrave Macmillan.
- Conrad, P. and Reinhartz, S. (1984) 'Computers and qualitative data: Editor's introductory essay', *Qualitative Sociology*, Vol. 7, No. 1, pp. 3-15.
- Copeland, H. L. and Hewson, M. G. (2000) 'Developing and testing an instrument to measure the effectiveness of clinical teaching in an academic medical center', *Academic Medicine*, Vol. 75, No. 2, pp. 161-166.
- Cowburn, J. (2008) *Free will, predestination, and determinism*, Marquette University Press.
- Creswell, J. W. (1994) *Research design*, Sage publications Thousand Oaks, CA.
- Creswell, J. W. (2003) *Research design: Qualitative, quantitative, and mixed methods approaches*, Sage Publications, Incorporated.
- Creswell, J. W. (2008) *Research design: Qualitative, quantitative, and mixed methods approaches*, Sage Publications, Incorporated.
- Crotty, M. (1998) *The foundations of social research: Meaning and perspective in the research process*, Sage.
- Cunliffe, A. L. (2003) 'Reflexive inquiry in organizational research: questions and possibilities', *Human Relations*, Vol. 56, No. 8, pp. 983-1003.
- De Haes, S. and Van Grembergen, W. (2004) 'IT Governance and its Mechanisms', *Information Systems Control Journal*, Vol. 1, pp. 27-33.
- De Siqueira, A. C. (2005) 'The regulation of education through the WTO/GATS', *Journal for Critical Education Policy Studies*, Vol. 3, No. 1, pp. 1-11.
- Deem, R. (1998) 'New managerialism and higher education: The management of performances and cultures in universities in the United Kingdom', *International Studies in Sociology of Education*, Vol. 8, No. 1, pp. 47-70.

- Deetz, S. (1996) 'Crossroads—Describing Differences in Approaches to Organization Science: Rethinking Burrell and Morgan and Their Legacy', *Organization science*, Vol. 7, No. 2, pp. 191-207.
- Denzin, N. and Lincoln, Y. (1998) 'Strategies of qualitative inquiry'.
- Denzin, N. K. and Lincoln, Y. (2000) 'Qualitative Research', *Thousand Oaks ua*.
- Denzin, N. K. and Lincoln, Y. S. (2008) *Collecting and interpreting qualitative materials*, Sage Publications, Incorporated.
- Devaraj, S. and Kohli, R. (2003) 'Performance impacts of information technology: Is actual usage the missing link?', *Management science*, pp. 273-289.
- Dey, I. (2003) *Qualitative data analysis: A user friendly guide for social scientists*, Routledge.
- Dyer, W. G. and Wilkins, A. L. (1991) 'Better stories, not better constructs, to generate better theory: A rejoinder to Eisenhardt', *Academy of management review*, Vol. 16, No. 3, pp. 613-619.
- Earl, M. J. and Feeny, D. (2012) 'Is your CIO adding value', *Sloan Management Review*, Vol. 35, No. 3.
- Easterby-Smith, M., Thorpe, R., Jackson, P. and Lowe, A. (2008) *Management research*, SAGE Publications Limited.
- Eisenhardt, K. M. (1989) 'Building theories from case study research', *Academy of management review*, pp. 532-550.
- Eisenhardt, K. M. and Graebner, M. E. (2007) 'Theory building from cases: Opportunities and challenges', *Academy of Management Journal*, Vol. 50, No. 1, pp. 25-32.
- Enns, H. (2000) 'Chief information officers' influence behaviors, outcomes, and technical background roles', *The University of Western Ontario (Canada), Canada*.
- Enns, H. and Huff, S. (2000) *Chief Information Officer Influence: An Exploratory Study*. Citeseer.
- Enns, H. G., Huff, S. L. and Higgins, C. A. (2003) 'CIO lateral influence behaviors: Gaining peers' commitment to strategic information systems', *MIS quarterly*, Vol. 27, No. 1, pp. 155-176.
- Enns, H. G., McFarlin, D. B. and Huff, S. L. (2007) 'How CIOs can effectively use influence behaviors', *MIS Quarterly Executive*, Vol. 6, No. 1, pp. 29-38.
- Enns, H. G., McFarlin, D. B. and Huff, S. L. (2007) 'How CIOs Can Effectively Use Influence Behaviors', *MIS Quarterly Executive*, Vol. 6, No. 1.
- Fayol, H. (1916) 'General and Industrial Management', in New York: IEEE Press, pp.

Feeny, D. F. and Willcocks, L. P. (1998) 'Core IS capabilities for exploiting information technology', *Sloan Management Review*, Vol. 39, No. 3, pp. 9-21.

Feldman, K. A. (1987) 'Research productivity and scholarly accomplishment of college teachers as related to their instructional effectiveness: A review and exploration', *Research in higher education*, Vol. 26, No. 3, pp. 227-298.

Ferraro, J. M. (2000) 'Reflective practice and professional development. ERIC Digest', *Washington, DC: ERIC Clearinghouse on Teaching and Teacher Education, American Association of Colleges for Teacher Education.*

Fielding, N. (2000) *The shared fate of two innovations in qualitative methodology: The relationship of qualitative software and secondary analysis of archived qualitative data.*

Fitzgerald, B. (2003) 'Informing each other: Bridging the gap between researcher and practitioners', *Informing Science*, Vol. 6, pp. 13-19.

Fry, H., Ketteridge, S. and Marshall, S. (2008) *A handbook for teaching and learning in higher education: Enhancing academic practice*, Routledge.

Galloway, I. (2010) *Exploration into the impact of CEO and CIO shared knowledge on firm performance*, Thesis, Concordia University.

Gammelgard, M., Lindstrom, A. and Simonsson, M. (2006) *A reference model for IT management responsibilities*. IEEE.

Gartner (2012) 'Gartner Says Customer Experience Enters Top 10 Cio Technology Priorities for 2012', *Press Release*.

Gausdal, A. H. (2008) 'Developing regional communities of practice by network reflection: the case of the Norwegian electronics industry', *Entrepreneurship and Regional Development*, Vol. 20, No. 3, pp. 209-235.

Gibbs, G. R., Friese, S. and Mangabeira, W. C. (2002) *The use of new technology in qualitative research. Introduction to Issue 3 (2) of FQS.*

Gibson, W. and Brown, A. (2009) *Working with qualitative data*, Sage Publications Limited.

Gill, J. and Johnson, P. (2002) *Research methods for managers*, Sage Publications Limited.

Gleeson, D. and Shain, F. (1999) 'Managing ambiguity: between markets and managerialism-a case study of 'middle' managers in further education', *The Sociological Review*, Vol. 47, No. 3, pp. 461-490.

Glenn, M. and D'Agostino, D. (2008) 'The Future of Higher Education: How Technology Will Shape Learning', *New Media Consortium*.

- Goles, T. and Hirschheim, R. (2000) 'The paradigm is dead, the paradigm is dead... long live the paradigm: the legacy of Burrell and Morgan', *Omega*, Vol. 28, No. 3, pp. 249-268.
- Gomm, R., Hammersley, M. and Foster, P. (2000) *Case study method: Key texts, key issues*, Sage.
- Gosling, J. and Mintzberg, H. (2003) 'The five minds of a manager', *Harvard business review*, Vol. 81, No. 11, pp. 54-63.
- Gottschalk, P. (2000a) 'The Chief Information Officer: A Study of Managerial Roles', *International Journal of Technology, Policy and Management*, Vol. 2, No. 2/2002000, pp. 93-101.
- Gottschalk, P. (2000b) 'Information systems executives: the changing role of new IS/IT leaders', *Informing Science*, Vol. 3, No. 2, pp. 31-40.
- Gottschalk, P. (2000c) *IS/IT leadership roles*. IEEE.
- Gottschalk, P. (2002) *The chief information officer: a study of managerial roles in Norway*. Published by the IEEE Computer Society.
- Gottschalk, P. and Taylor, N. J. (2000) *Strategic management of IS/IT functions: the role of the CIO*. IEEE.
- Greene, J. C. (2006) 'Toward a methodology of mixed methods social inquiry', *Research in the Schools*, Vol. 13, No. 1, pp. 93-98.
- Gregor, S. (2006) 'The nature of theory in information systems', *MIS quarterly*, pp. 611-642.
- Grover, V., Jeong, S. R., Kettinger, W. J. and Lee, C. C. (1993) 'The chief information officer: A study of managerial roles', *Journal of Management Information Systems*, Vol. 10, No. 2, pp. 107-130.
- Grünbaum, N. N. (2007) 'Identification of ambiguity in the case study research typology: what is a unit of analysis?', *Qualitative Market Research: an international journal*, Vol. 10, No. 1, pp. 78-97.
- Guba, E. G. and Lincoln, Y. S. (1982) 'Epistemological and methodological bases of naturalistic inquiry', *ECTJ*, Vol. 30, No. 4, pp. 233-252.
- Guba, E. G. and Lincoln, Y. S. (1989) *Fourth generation evaluation*, SAGE Publications, Incorporated.
- Guba, E. G. and Lincoln, Y. S. (1994) 'Competing paradigms in qualitative research', *Handbook of qualitative research*, Vol. 2, pp. 163-194.

- Guillemette, M. G. and Paré, G. (2012) 'Toward a New Theory of the Contribution of the IT Function in Organizations', *Mis Quarterly*, Vol. 36, No. 2.
- Haes, S. D. and Grembergen, W. V. (2008) *Analysing the Relationship Between IT Governance and Business/IT Alignment Maturity*. IEEE.
- Hales, C. P. (1986) 'What do managers do? A critical review of the evidence', *Journal of Management Studies*, Vol. 23, No. 1, pp. 88-115.
- Hancock, P. and Tyler, M. (2004) 'MOT your life': Critical management studies and the management of everyday life', *Human Relations*, Vol. 57, No. 5, pp. 619-645.
- Hanna, N. K. (2007) 'e-Leadership institutions for the knowledge economy', *World Bank Institute Working Paper*. Washington, DC: World Bank.
- Hardesty, D. M. and Bearden, W. O. (2004) 'The use of expert judges in scale development: Implications for improving face validity of measures of unobservable constructs', *Journal of Business Research*, Vol. 57, No. 2, pp. 98-107.
- Hawkins, B. L. (2008) 'Accountability, Demands for Information, and the Role of the Campus IT Organization', *The Tower and The Cloud*, pp. 98.
- Heck, R. H. and Hallinger, P. (2005) 'The Study of Educational Leadership and Management Where Does the Field Stand Today?', *Educational Management Administration & Leadership*, Vol. 33, No. 2, pp. 229-244.
- Henn, M., Weinstein, M. and Foard, M. N. (2005) *A short introduction to social research*, SAGE Publications Limited.
- Hersey, P. and Blanchard, K. H. (1969) *Management of organizational behavior*, Prentice-Hall Englewood Cliffs, NJ.
- HETAC (2006) 'External Review of HETAC' [Online]. Available at: <http://www.hetac.ie/docs/Appendix%205.pdf> (Accessed 17th June 2012).
- HETAC (2012) 'Higher Education and Training Awards Council' [Online]. Available at: <http://www.hetac.ie/> (Accessed 18th June 2012).
- Hodgson, L. and Lane, M. S. (2010) 'What are the key job functions and critical competencies required for the role of the CIO in achieving superior organizational performance?', *Issues in Informing Science and Information Technology*, vol 7, pp. 257-266.
- Hogan, J., Dolan, P. and Donnelly, P. (2009) *Approaches to Qualitative Research Theory & its Practical Application*, Cork: Oak Tree Press.
- Holmes, A. (2006) 'The art of influence', *CIO*, Vol. 20, No. 3, pp. 48-58.

- Hu, Q., Yayla, A. A. and Lei, Y. (2014) *Does Inclusion of CIO in Top Management Team Impact Firm Performance? Evidence from a Long-Term Event Analysis*. IEEE.
- Hunter, G. (2010) 'The Chief Information Officer: A Review of the Role', *Journal of Information, Information Technology, and Organizations*, Vol. 52010, pp. 18.
- Iyengar, K. P. (2007) *The effect of leadership style on cio effectiveness*, ProQuest.
- Iyengar, K. P. (2008) 'The effect of leadership style on CIO effectiveness'.
- Jackson, G. (2004) 'A CIO's Question: Will You Still Need Me When I'm 64?', *Chronicle of Higher Education*, Vol. 50, No. 21, pp. B22.
- James, K. and Vinnicombe, S. (2002) 'Acknowledging the individual in the researcher', *Essential skills for management research*, pp. 84-98.
- Johnson, A. M. and Lederer, A. L. (2010) 'CEO/CIO mutual understanding, strategic alignment, and the contribution of IS to the organization', *Information & Management*, Vol. 47, No. 3, pp. 138-149.
- Jonas, D. (2010) 'Empowering project portfolio managers: How management involvement impacts project portfolio management performance', *International Journal of Project Management*, Vol. 28, No. 8, pp. 818-831.
- Kaarst-Brown, M. L. and Kelly, S. (2005) *IT Governance and Sarbanes-Oxley: The latest sales pitch or real challenges for the IT Function?*
- Karahanna, E. and Watson, R. T. (2006) 'Information systems leadership', *Engineering Management, IEEE Transactions on*, Vol. 53, No. 2, pp. 171-176.
- Karami, A., Rowley, J. and Analoui, F. (2006) 'Research and knowledge building in management studies: An analysis of methodological preferences', *International Journal of Management*, Vol. 23, No. 1, pp. 43.
- Katz, R. N. (2004) *Information technology leadership in higher education: The condition of the community*, EDUCAUSE Center for Applied Research.
- Katz, R. N. (2008) 'The gathering cloud: Is this the end of the middle', *The tower and the cloud: Higher education in the age of cloud computing*, pp. 2-42.
- Kehm, B. (2006) *Professionalizing Mid-Level Management in Higher Education Institutions*.
- Kelley, T. D. and Sharif, N. M. (2005) 'Understanding the mindset of higher education CIOs', *Educause Quarterly*, Vol. 28, No. 4, pp. 33.

- Kelliher, F. (2005) 'Interpretivism and the pursuit of research legitimisation: an integrated approach to single case design', *The Electronic Journal of Business Research Methodology*, Vol. 3, No. 2, pp. 123-132.
- Kerlinger, F. N. (1986) *Foundations of Behavioral Research Third Edition*, Florida: Harcourt Brace College Publishers.
- Khatri, V. and Brown, C. V. (2010) 'Designing data governance', *Communications of the ACM*, Vol. 53, No. 1, pp. 148-152.
- Ko, D. and Fink, D. (2010) 'Information technology governance: an evaluation of the theory-practice gap', *Corporate Governance*, Vol. 10, No. 5, pp. 662-674.
- Kogan, M. (2007) 'The academic profession and its interface with management', *Key challenges to the academic profession*, pp. 161.
- Kurien, P. and Purushottam, V. (2004) 'The case for re-examining IT effectiveness', *Journal of Business Strategy*, Vol. 25, No. 2, pp. 29-36.
- Kurke, L. B. and Aldrich, H. E. (1983) 'Mintzberg was right!: A replication and extension of the nature of managerial work', *Management science*, pp. 975-984.
- Lamond, D. (2003) 'Henry Mintzberg vs Henri Fayol: Of Lighthouses, Cubists and the Emperor's New Clothes', *Journal of Applied Management and Entrepreneurship*, Vol. 8, No. 4, pp. 5-28.
- Lamond, D. (2004) 'A matter of style: reconciling Henri and Henry', *Management Decision*, Vol. 42, No. 2, pp. 330-356.
- Lance, D. D. (2006) *Examining the CEO/CIO disconnect using Luftman's strategic alignment maturity assessment model five years later*, Thesis, CAPELLA UNIVERSITY.
- Lane, D. C. (2001) 'Rerum cognoscere causas: Part I—How do the ideas of system dynamics relate to traditional social theories and the voluntarism/determinism debate?', *System Dynamics Review*, Vol. 17, No. 2, pp. 97-118.
- Lau, A. W., Newman, A. R. and Broedling, L. A. (1980) 'The nature of managerial work in the public sector', *Public Administration Review*, Vol. 40, No. 5, pp. 513-520.
- Lau, A. W. and Pavett, C. M. (1980) 'The Nature of Managerial Work: A Comparison of Public- and Private-Sector Managers', *Group & Organization Studies*, Vol. 5, No. 4, pp. 453 - 466.
- Lee, A. S. (1991) 'Integrating positivist and interpretive approaches to organizational research', *Organization science*, pp. 342-365.
- Lineman, J. P. (2006) *The chief information officer in higher education: A study in managerial roles*, Thesis, CAPELLA UNIVERSITY.

- Lineman, J. P. (2007) 'The corporate CIO model and the higher education CIO', *Educause Quarterly*, Vol. 30, No. 1, pp. 4.
- Linsky, A. S. and Straus, M. A. (1975) 'Student evaluations, research productivity, and eminence of college faculty', *Journal of higher Education*.
- Liu, G. H., Li, J. and Wang, E. T. (2013) 'Obtaining Management Support for IT Projects: A Persuasion View'.
- Luftman, J. (2000) 'Assessing business-IT alignment maturity', *Strategies for information technology governance*, Vol. 4, pp. 99.
- Lundberg, C. C. and Young, C. A. (2005) *Foundations for inquiry: Choices and trade-offs in the organizational sciences*, Stanford University Press.
- Luthans, F. (1988) 'Successful vs. effective real managers', *The Academy of Management Executive (1987-1989)*, Vol. 2, No. 2, pp. 127-132.
- Lynch, C. A. (2008) 'A Matter of Mission: Information Technology and the Future of Higher Education', *The tower and the cloud: Higher education in the age of cloud computing*, pp. 43-50.
- Maditinos, D. I., Kokkinos, N. C. and Papadopoulou, M. (2012) 'Chief Information Officers' roles and responsibilities in the Greek Industry'.
- Mahoney, T. A., Jerdee, T. H. and Carroll, S. J. (1965) 'The job (s) of management', *Industrial Relations: A Journal of Economy and Society*, Vol. 4, No. 2, pp. 97-110.
- Mandell, M. and Steelman, T. (2003) 'Understanding what can be accomplished through interorganizational innovations The importance of typologies, context and management strategies', *Public Management Review*, Vol. 5, No. 2, pp. 197-224.
- March, S. T. and Storey, V. C. (2008) 'Design science in the information systems discipline: an introduction to the special issue on design science research', *MIS quarterly*, Vol. 32, No. 4, pp. 725-730.
- Marginson, S. (2010) 'Higher education in the global knowledge economy', *Procedia-Social and Behavioral Sciences*, Vol. 2, No. 5, pp. 6962-6980.
- Marginson, S. and Wende, M. (2007) 'Globalisation and higher education', pp. 1-85.
- Marks, A. and Rezgui, Y. (2008) 'IT Leadership in Higher Education: The CIO Candidate', *Management science*, Vol. 54, No. 3, pp. 415-428.
- Marks, A. and Rezgui, Y. (2011) 'IT Leadership in Higher Education: The CIO Candidate', *IT Professional Magazine*, Vol. 13, No. 3, pp. 52-56.

- Martinko, M. J. and Gardner, W. L. (1985) 'Beyond structured observation: Methodological issues and new directions', *Academy of management review*, Vol. 10, No. 4, pp. 676-695.
- Mason, J. (2002) *Qualitative researching*, Sage.
- Matsushita, M., Schoenbaum, T. J. and Mavroidis, P. C. (2006) *The World Trade Organization*, Oxford University Press.
- Maxwell, J. A. (1992) 'Understanding and validity in qualitative research', *Harvard educational review*, Vol. 62, No. 3, pp. 279-301.
- McCall, M. W. and Segrist, C. A. (1980) *In Pursuit of the Manager's Job: Building on Mintzberg*, Center for Creative Leadership.
- McGrath, J. E. (1984) *Groups: Interaction and performance*, Prentice-Hall Englewood Cliffs, NJ.
- McLean, E. R. and Smits, S. J. (2012) 'Management, Leadership, and the Roles of the CIO'.
- Melville, N., Kraemer, K. and Gurbaxani, V. (2004) 'Review: Information technology and organizational performance: An integrative model of IT business value', *MIS quarterly*, Vol. 28, No. 2, pp. 283-322.
- Menz, M. (2012) 'Functional Top Management Team Members A Review, Synthesis, and Research Agenda', *Journal of Management*, Vol. 38, No. 1, pp. 45-80.
- Meredith, J. (1998) 'Building operations management theory through case and field research', *Journal of Operations Management*, Vol. 16, pp. 441-454.
- Meyer, H. D. (2002) 'The new managerialism in education management: corporatization or organizational learning?', *Journal of Educational Administration*, Vol. 40, No. 6, pp. 534-551.
- Miles, M. B. and Huberman, A. M. (1984) *Qualitative data analysis: A sourcebook of new methods*, Sage publications.
- Miles, M. B. and Huberman, A. M. (1994) *Qualitative data analysis: An expanded sourcebook*, SAGE publications, Inc.
- Mills, J., Bonner, A. and Francis, K. (2008) 'The development of constructivist grounded theory', *International journal of qualitative methods*, Vol. 5, No. 1, pp. 25-35.
- Mintzberg, H. (1971) 'Managerial work: analysis from observation', *Management science*, pp. 97-110.
- Mintzberg, H. (1973) *The nature of managerial work*, New York: Harper & Row.

- Mintzberg, H. (1979) 'The structuring of organizations: A synthesis of the research', *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.
- Mintzberg, H. (1989) *Mintzberg on management: Inside our strange world of organizations*, Simon and Schuster.
- Mintzberg, H. (1990) 'The design school: reconsidering the basic premises of strategic management', *Strategic management journal*, Vol. 11, No. 3, pp. 171-195.
- Mintzberg, H. (2004) *Managers, not MBAs: A hard look at the soft practice of managing and management development*, Berrett-Koehler Publishers.
- Mintzberg, H. and Gosling, J. (2002) 'Educating managers beyond borders', *Academy of Management Learning & Education*, Vol. 1, No. 1, pp. 64-76.
- Mithas, S. and Krishnan, M. (2009) 'From association to causation via a potential outcomes approach', *Information systems research*, Vol. 20, No. 2, pp. 295-313.
- Mitra, S., Sambamurthy, V. and Westerman, G. (2011) 'Measuring IT Performance and Communicating Value', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 47-59.
- Morse, J. M., Barrett, M., Mayan, M., Olson, K. and Spiers, J. (2008) 'Verification strategies for establishing reliability and validity in qualitative research', *International journal of qualitative methods*, Vol. 1, No. 2, pp. 13-22.
- Napier, N. P., Keil, M. and Tan, F. B. (2007) 'IT project managers' construction of successful project management practice: a repertory grid investigation', *Information Systems Journal*, Vol. 19, No. 3, pp. 255-282.
- NASCIO (2008) 'IT Governance and Business Outcomes—A Shared Responsibility between IT and Business Leadership', *NASCIO Governance Series*.
- Nelson, M. (2003) 'The CIO in higher education: Leadership, competencies, effectiveness', *ECAR Research Bulletin*.
- Neumann, R. (1992) 'Perceptions of the teaching-research nexus: A framework for analysis', *Higher Education*, Vol. 23, No. 2, pp. 159-171.
- Nicolet, T. (2011) 'Leadership in higher education: the CIO role and the leadership team'.
- Nkwe, N. (2013) 'Chief Information Officer position in Botswana's private and public sector', *Global Business and Economics Research Journal*, Vol. 2, No. 1, pp. 39-49.
- Nola, R. (1988) *Relativism and realism in science*, Springer.

- Noordegraaf, M. and Stewart, R. (2000) 'Managerial behaviour research in private and public sectors: distinctiveness, disputes and directions', *Journal of Management Studies*, Vol. 37, No. 3, pp. 427-443.
- Nudurupati, S. S., Bititci, U. S., Kumar, V. and Chan, F. T. (2011) 'State of the art literature review on performance measurement', *Computers & Industrial Engineering*, Vol. 60, No. 2, pp. 279-290.
- O'Toole, L. J. and Meier, K. J. (1999) 'Modeling the impact of public management: Implications of structural context', *Journal of Public Administration Research and Theory*, Vol. 9, No. 4, pp. 505-526.
- Onwuegbuzie, A. J. and Leech, N. L. (2005) 'On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies', *International Journal of Social Research Methodology*, Vol. 8, No. 5, pp. 375-387.
- Paolillo, J. G. P. (1987) 'Role profiles for managers in different functional areas', *Group & Organization Management*, Vol. 12, No. 1, pp. 109-118.
- Patton, M. Q. (2002) *Qualitative Research & Evaluation Methods, 3rd Edition*, Sage Publications.
- Pavett, C. M. and Lau, A. W. (1983) 'Managerial work: The influence of hierarchical level and functional specialty', *The academy of management journal*, Vol. 26, No. 1, pp. 170-177.
- Penrod, J. I. (2003) 'Creating a realistic IT vision: The roles and responsibilities of a chief information officer', *The Technology Source*.
- Penrod, J. I. (2005) 'Reflections on a Career as a Four-Time CIO', *Research Bulletin*.
- Penrod, J. I., Dolence, M. G. and Douglas, J. V. (1990) *The chief information officer in higher education*, CAUSE.
- Peppard, J. (2010a) 'The Hi-Impact Chief Information Officer (CIO): Reframing the CxO Dialogue'.
- Peppard, J. (2010b) 'Unlocking the performance of the chief information officer (CIO)', *California Management Review*, Vol. 52, No. 4, pp. 73-99.
- Peppard, J., Edwards, C. and Lambert, R. (2011) 'Clarifying the Ambiguous Role of the CIO', *MIS Quarterly Executive*, Vol. 10, No. 1, pp. 31-44.
- Pereira, C. M. and Sousa, P. (2005) *Enterprise architecture: business and IT alignment*. ACM.
- Polansky, M., Inuganti, T. and Wiggins, S. (2004) 'The 21st century CIO', *Business Strategy Review*, Vol. 15, No. 2, pp. 29-33.

- Pratt, G. and Poole, D. (2000) 'Global corporations "R" us? The impacts of globalisation on Australian universities', *Australian Universities' Review*, Vol. 43, No. 1.
- Preston, D. S., Chen, D. and Leidner, D. E. (2008) 'Examining the Antecedents and Consequences of CIO Strategic Decision-Making Authority: An Empirical Study*', *Decision Sciences*, Vol. 39, No. 4, pp. 605-642.
- Preston, D. S., Chen, D. and Leidner, D. E. (2008a) 'Examining the Antecedents and Consequences of CIO Strategic Decision Making Authority: An Empirical Study*', *Decision Sciences*, Vol. 39, No. 4, pp. 605-642.
- Preston, D. S. and Karahanna, E. (2009) 'Antecedents of IS strategic alignment: a nomological network', *Information systems research*, Vol. 20, No. 2, pp. 159-179.
- Preston, D. S., Leidner, D. E. and Chen, D. (2008b) 'CIO leadership profiles: implications of matching CIO authority and leadership capability on IT impact', *MIS Quarterly Executive*, Vol. 7, No. 2, pp. 57-69.
- Punch, K. F. (2005) *Introduction to social research: Quantitative and qualitative approaches*, Sage Publications Limited.
- Ramsden, P. and Moses, I. (1992) 'Associations between research and teaching in Australian higher education', *Higher Education*, Vol. 23, No. 3, pp. 273-295.
- Raths, D. (2014) 'The New CIO: Strategist, Change Leader, Digital Guide' [Online]. Available at: http://campustechnology.com/research/2014/03/magazine_march.aspx (Accessed March 2014).
- Rau, K. G. (2004) 'Effective governance of IT: Design objectives, roles, and relationships', *Information Systems Management*, Vol. 21, No. 4, pp. 35-42.
- Richards, L. (2005) *Handling qualitative data: A practical guide*, Sage Publications Limited.
- Roberts, K. A. and Wilson, R. W. (2002) *ICT and the research process: Issues around the compatibility of technology with qualitative data analysis*.
- Rockart, J. F. (1982) 'The changing role of the information systems executive: a critical success factors perspective', *Sloan Management Review*, Vol. 24, No. 1, pp. 3-13.
- Rockart, J. F., Ball, L. and Bullen, C. V. (1982) 'Future role of the information systems executive', *MIS quarterly*, pp. 1-14.
- Roets, R. and Sewry, D. (2006) *ICT: Irrelevant to Transformation in Higher Educational Institutions*. Pretoria, South Africa,
- Romano, R. (2005) 'The Sarbanes-Oxley Act and the making of quack corporate governance', *Yale Law Journal*, pp. 1521-1611.

- Ross, J. W. and Feeny, D. F. (1999) 'The evolving role of the CIO', *Oxford Institute of Information Management-Research and Discussion Paper*.
- Saunders, M., Lewis, P. and Thornhill, A. (2003) *Research methods for business students*, 3rd Edn. Prentice Hall, London.
- Sayles, L. R. (1999) 'Managerial Behavior and a journey through time', *The Leadership Quarterly*, Vol. 10, No. 1, pp. 7-11.
- Schofer, E. and Meyer, J. W. (2005) 'The worldwide expansion of higher education in the twentieth century', *American Sociological Review*, Vol. 70, No. 6, pp. 898-920.
- Schofield, J. W. (2002) 'Increasing the generalizability of qualitative research', *The qualitative researcher's companion*.
- Scott, J. E. (2007) 'Mobility, business process management, software sourcing, and maturity model trends: propositions for the IS organization of the future', *Information Systems Management*, Vol. 24, No. 2, pp. 139-145.
- Seddon, P. B., Walker, D., Reynolds, P. and Willcocks, L. (2008) 'A Case-Based Assessment of the Descriptiveness of Three CIO Typologies and Validity of Two CIO-Effectiveness Models'.
- Shaw, E. (1999) 'A guide to the qualitative research process: evidence from a small firm study', *Qualitative Market Research: an international journal*, Vol. 2, No. 2, pp. 59-70.
- Silverman, D. (2010) *Qualitative Research*, Sage.
- Simkins, T. (2000) 'Education reform and managerialism: comparing the experience of schools and colleges', *Journal of Education Policy*, Vol. 15, No. 3, pp. 317-332.
- Slaughter, S. (2004) *Academic capitalism and the new economy: Markets, state, and higher education*, JHU Press.
- Smaltz, D. H., Sambamurthy, V. and Agarwal, R. (2006) 'The antecedents of CIO role effectiveness in organizations: An empirical study in the healthcare sector', *Engineering Management, IEEE Transactions on*, Vol. 53, No. 2, pp. 207-222.
- Smircich, L. and Morgan, G. (1982) 'Leadership: The management of meaning', *Journal of Applied Behavioral Science*, Vol. 18, No. 3, pp. 257-273.
- Srivastava, A., Bartol, K. M. and Locke, E. A. (2006) 'Empowering leadership in management teams: Effects on knowledge sharing, efficacy, and performance', *Academy of Management Journal*, Vol. 49, No. 6, pp. 1239-1251.
- Stake, R. E. (1978) 'The case study method in social inquiry', *Educational researcher*, pp. 5-8.
- Stake, R. E. (1995) *The art of case study research*, Sage Publications, Incorporated.

- Stake, R. E. (2005) *Qualitative case studies*, Sage Publications Ltd.
- Stephens, C. S., Ledbetter, W. N., Mitra, A. and Ford, F. N. (1992) 'Executive or functional manager? The nature of the CIO's job', *MIS quarterly*, pp. 449-467.
- Stewart, R. (1982) 'A Model for Understanding Managerial Jobs and Behavior', *Academy of management review*, Vol. 7, No. 1, pp. 7-13.
- Stewart, R. (2007) 'Studies of managerial jobs and behaviour: the ways forward', *Journal of Management Studies*, Vol. 26, No. 1, pp. 1-10.
- Sutton, S. G. and Arnold, V. (2005) 'The Sarbanes-Oxley Act and the changing role of the CIO and IT function', *International Journal of Business Information Systems*, Vol. 1, No. 1, pp. 118-128.
- Szekeres, J. (2006) 'General staff experiences in the corporate university', *Journal of Higher Education Policy and Management*, Vol. 28, No. 2, pp. 133-145.
- Taylor, B. (2014) 'CIOs need to re-brand themselves as drivers of digital innovation, says EY's David Nichols' [Online]. Available at: <http://www.techrepublic.com/article/cios-need-to-re-brand-themselves-as-drivers-of-digital-innovation-says-ey-s-david-nichols/> (Accessed May 1st 2014).
- Tengblad, S. (2006) 'Is there a 'New Managerial Work'? A Comparison with Henry Mintzberg's Classic Study 30 Years Later*', *Journal of Management Studies*, Vol. 43, No. 7, pp. 1437-1461.
- Thompson, R. (2002) *Reporting the results of computer-assisted analysis of qualitative research data*.
- Todd, P. A., McKeen, J. D. and Gallupe, R. B. (1995) 'The evolution of IS job skills: A content analysis of IS job advertisements from 1970-1990', *Management Information Systems Quarterly*, Vol. 19, pp. 1-1.
- Torkzadeh, G. and Doll, W. J. (1999) 'The development of a tool for measuring the perceived impact of information technology on work', *Omega*, Vol. 27, No. 3, pp. 327-339.
- Utley, A. (2001) 'Outbreak of 'new managerialism' infects faculties', *Times Higher Education Supplement*, Vol. 20.
- Van Baalen, P., Bloemhof-Ruwaard, J. and Van Heck, E. (2005) 'Knowledge Sharing in an Emerging Network of Practice:: The Role of a Knowledge Portal', *European Management Journal*, Vol. 23, No. 3, pp. 300-314.
- Van Grembergen, W. and De Haes, S. (2005) 'Measuring and improving IT governance through the balanced scorecard', *Information Systems Control Journal*, Vol. 2, No. 1, pp. 35-42.

- Voss, C., Tsikriktsis, N. and Frohlich, M. (2002) 'Case research in operations management', *International journal of operations & production management*, Vol. 22, No. 2, pp. 195-219.
- Vreuls, E. H. and Joia, L. A. (2011) 'An Exploratory Model for the Relevant Factors Related to the Professional Performance of the Brazilian CIO', *The Electronic Journal of Information Systems in Developing Countries*, Vol. 47.
- Weill, P. (1992) 'The relationship between investment in information technology and firm performance: A study of the valve manufacturing sector', *Information systems research*, Vol. 3, No. 4, pp. 307-333.
- Weill, P. (2004) 'Don't just lead, govern: How top-performing firms govern IT', *MIS Quarterly Executive*, Vol. 3, No. 1, pp. 1-17.
- Weill, P. and Ross, J. W. (2004) *IT governance: How top performers manage IT decision rights for superior results*, Harvard Business Press.
- Wellman, J. (2010) 'Accountability for Productivity', *Delta Project on Postsecondary Education Costs, Productivity and Accountability*.
- Welsh, E. (2002) *Dealing with data: Using NVivo in the qualitative data analysis process*.
- Wenger, E. (2011) 'Communities of practice: A brief introduction'.
- Wenger, E., McDermott, R. and Snyder, W. M. (2002) 'Seven principles for cultivating communities of practice', *Cultivating Communities of Practice: A Guide to Managing Knowledge*.
- Whitchurch, C. (2008) 'Shifting identities and blurring boundaries: The emergence of third space professionals in UK higher education', *Higher Education Quarterly*, Vol. 62, No. 4, pp. 377-396.
- Winter, R., Sarros, J. and Management, M. U. D. o. (2001a) *Corporate reforms to Australian universities: Views from the academic heartland*, Department of Management, Monash University.
- Winter, R., Sarros, J. and Management, M. U. D. o. (2001b) 'Corporate reforms to Australian universities: Views from the academic heartland'.
- Winter, R., Taylor, T. and Sarros, J. (2000) 'Trouble at mill: Quality of academic worklife issues within a comprehensive Australian university', *Studies in Higher Education*, Vol. 25, No. 3, pp. 279-294.
- Yin, R. K. (1981) 'The case study crisis: Some answers', *Administrative Science Quarterly*, Vol. 26, No. 1, pp. 58-65.
- Yin, R. K. (1994) *Case Study Research*, Beverly Hills, CA: Sage.

Yukl, G., Gordon, A. and Taber, T. (2002) 'A hierarchical taxonomy of leadership behavior: Integrating a half century of behavior research', *Journal of Leadership & Organizational Studies*, Vol. 9, No. 1, pp. 15-32.

Zimmermann, N. (2011) *Dynamics of drivers of organizational change*, Springer.

Zuriff, G. (1998) 'Against metaphysical social constructionism in psychology', *Behavior and Philosophy*, Vol. 26, No. 1/2, pp. 5-28.