THE INFORMATION SYSTEMS DISCIPLINE IN AUSTRALIAN UNIVERSITIES: A CONTEXTUAL FRAMEWORK

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ABSTRACT

This paper presents the contextual framework for a multi-method, multi-study of the State of the Information Systems Academic Discipline in Australia, and relates the genesis of the Australian study as preliminary to a larger Pacific-Asia study. Analysis of prior literature on the state of IS and on relevant theory, underpins a series of individual Australian state case studies that are combined with several conceptual analyses and a research issues survey. The paper outlines the methodological approach employed, with emphasis on the case study method of the multiple state studies. The process of multiple peer review of the studies is described. Importantly, this paper summarises and analyses each of the related sub-studies, also outlining ongoing work, beyond the overarching study reported herein.

INTRODUCTION

This paper presents the contextual framework for a multi-method, multi-study titled 'The Information Systems Discipline in Australian Universities' (the 'IS-in-Oz' study)[1]. Drawing on Whitley's Theory of Scientific Change, the study analyses the degree of 'professionalisation' of the Information Systems Discipline, the overarching research question being "To what extent is Information Systems a distinct and mature discipline in Australia?" This Australian study was spawned by a broader study of 'The State of the Information Systems Academic Discipline in Pacific Asia' (IS-in-PA), the results of which are forthcoming in a similarly titled special issue of Communications of the AIS (CAIS)[2]. A main aim of the IS-in-Oz study is to initiate an ongoing, longitudinal evaluation of the state of the IS academic discipline in Australia.

THE 'PARENT' IS IN PACIFIC ASIA STUDY (IS-IN-PA) DESIGN

Figure 1 depicts the main components of the 'parent' IS-in-PA study. The Pacific-Asia study (and its component Australian study) is motivated from a recognition that Information Systems (IS) as an academic discipline has evolved differentially around the world. For example, there is regional variation in the strength of its presence as an academic discipline; it may take on identifiably different local forms e.g. from a Soft Systems emphasis to a more technical focus; there may be

regional differences in topics taught and researched (as was observed by Avgerou et al. (1999) across Europe). The genesis of the study was a panel of the 6th Pacific Asia Conference on Information Systems (PACIS'02), Tokyo, Japan 2-4 September 2002, ultimately resulting in formal project commencement end 2004 with AIS endorsement and seed funding[3].

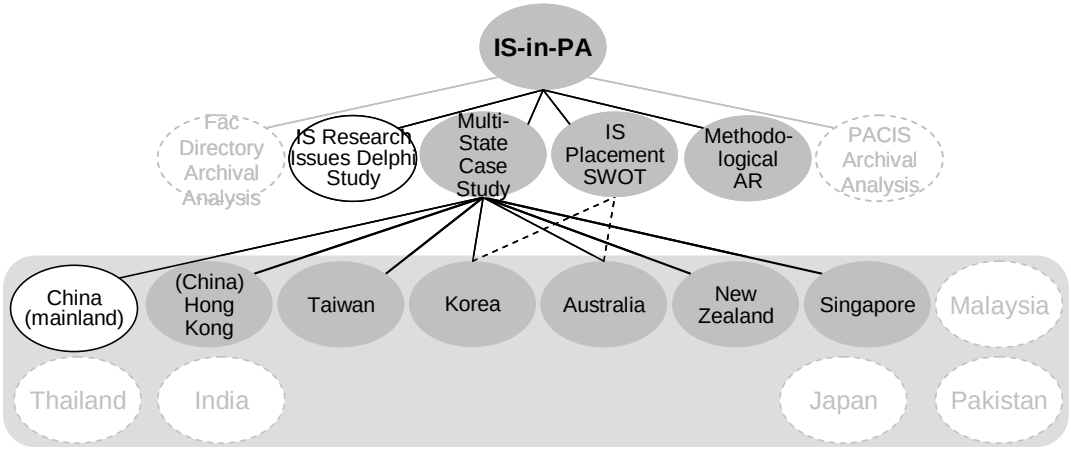

Figure 1 – The IS in Pacific Asia Region Study (IS-in-PA)

The IS-in-PA study includes nine main study components (see Figure 1), the principal of which is a multiple case study across six States of the Pacific Asia Region[4] (PA). It was decided early on to restrict the first iteration of the IS-in-PA study to those areas in the region where IS is relatively more visible internationally – Australia, Hong Kong (China), Korea, New Zealand, Singapore and Taiwan – the intent being in future to incrementally extend the study to other parts of the region[5]. Table 1 lists the main IS-in-PA study leaders.

State	Study Leader
Australia	Professor Guy G Gable, Queensland University of Technology
Hong Kong (China)	Professor Patrick Chau, The University of Hong Kong
Korea	Professor Jae-Nam Lee, Korea University
New Zealand	Professor Sid Huff, The University of Wellington
Singapore	Professor Bernard Tan, The National University of Singapore
Taiwan	Professor TP Liang, National Sun Yat-Sen University

Table 1 – The IS in Pacific Asia (IS-in-PA) Study Team

Both the IS-in-PA and IS-in-Oz studies have from the outset been designed and executed with the expectation that they will be extended and repeated over time. Shaded ovals in Figure 1 represent those components that are being completed in the first execution, with the detailed Australian results

reported in a special issue of Australasian Journal of Information Systems (AJIS)[6]. Unshaded ovals represent components that are in progress (E.g. Mainland China Case Study, IS Research Issues Delphi Study, Methodological Action Research/Learnings) and dashed ovals represent planned components soon to commence (note that further study components are expected to evolve).

THE AUSTRALIAN STUDY (IS-IN-OZ) DESIGN

A meeting of a sub-group of the IS-in-PA study team in Auckland January 2004 (Gable, Huff, Tan[7]) agreed that Australia, having been active in IS academe since the 70's, and having a correspondingly long and internationally visible history of IS research, would provide a useful 'pilot' study in advance of extending the multiple-state case study to other parts of Pacific Asia. This resulted in a proposal to conduct a multiple-case study of the Australian States – the IS-in-Oz study (Figure 2). Table 2 lists the main IS-in-Oz study team members.

Home State	Member
Queensland	Professor Guy G Gable, Queensland University of Technology Dr. Robert Smyth, Queensland University of Technology
ACT	Dr. Roger Clarke, Principal Xamax Consultancy Pty Ltd; and Visiting Professor, ANU Professor Shirley Gregor, Australian National University Professor Ed Lewis, Australian Defence Forces Academy, University of New South Wales Associate Professor Craig McDonald, University of Canberra
South Australia	Professor Andy Koronios, University of South Australia Associate Professor Mike Metcalfe, University of South Australia Professor Paula Swatman, University of South Australia
Tasmania	Dr. Gail Ridley, University of Tasmania
New South Wales	Professor Ernest Jordan, Macquarie University Dr. Jim Underwood, University of Technology -Sydney
Victoria	Dr. Elsie Chan, Australian Catholic University Associate Professor Carol Pollard, Appalachian State University Professor Graeme Shanks, Monash University
West Australia	Professor Janice Burn, Edith Cowan University Dr Chad Lin, Edith Cowan University Professor Graham Pervan, Curtin University of Technology Professor Craig Standing, Edith Cowan University

Table 2 – The IS in Australia (IS-in-Oz) Study Team

As in Figure 1, in Figure 2 shaded ovals represent those components that have been completed and are reported together in the special issue of AJIS. Unshaded ovals represent components that are in progress (e.g. ACIS Archival Analysis) and which will be reported in future.

There are 12 shaded ovals in Figure 2, corresponding with the 12 completed IS-in-Oz sub-studies. These include 3 conceptual studies (The Contextual Framework, The History, and the Theory Base) and 9 empirical papers (7 state case studies, a research survey and a 'contradictions' piece)[8].

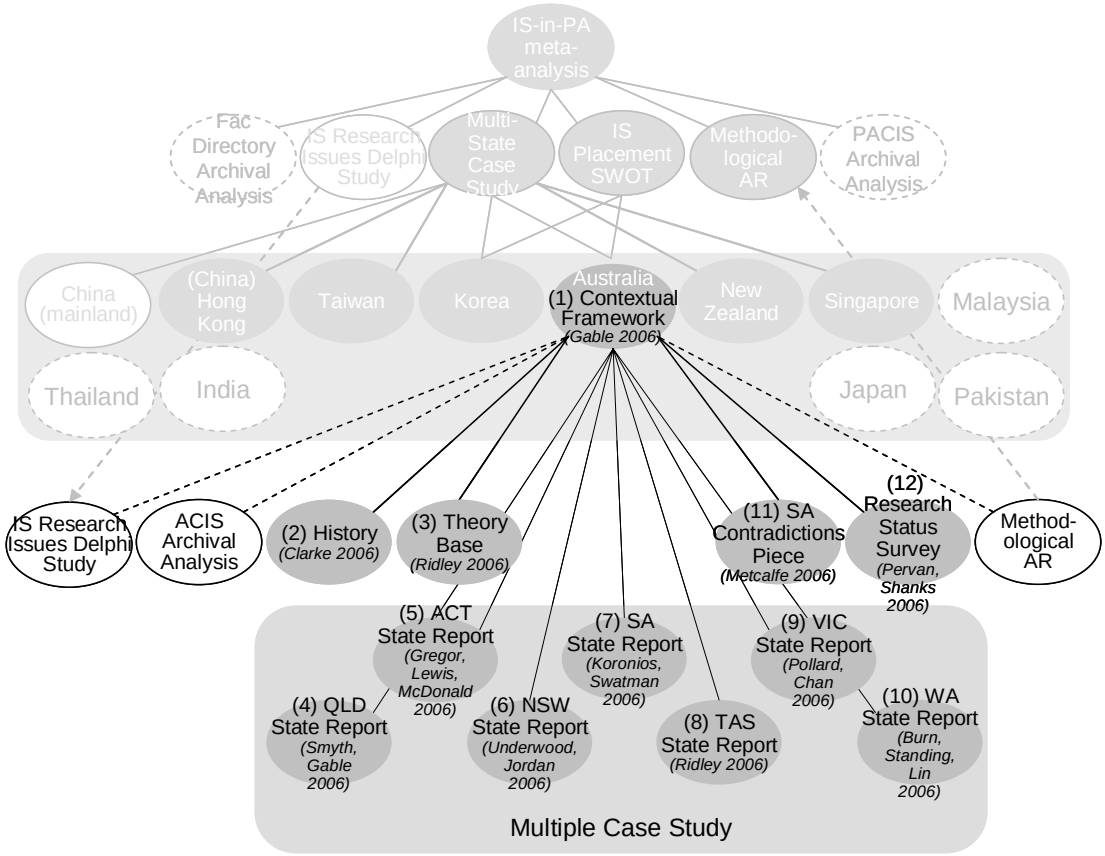

Figure 2 – The IS in Australia (IS-in-Oz) Study[9]

The IS-in-Oz (and IS-in-PA) study has from the outset sought to establish the 'beginnings' of a cumulative and ongoing effort to track and report on, and reflect upon the evolution, state and diffusion of the IS academic discipline in Australia (and Pacific Asia, and ultimately other world regions). Note that the study was never intended to be an exploration of the 'core of the IS discipline'[10], though it is anticipated that the IS-in-Oz results (and those from the IS-in-PA study and any subsequent replication) will contribute to that discussion.

This IS-in-Oz study seeks to draw upon and complement other recent or planned studies of the state of the IS discipline, notably those of Avgerou et al (1999) in Europe, and Pervan and Shanks (2004) in Australia. The IS-in-Oz study, being exploratory and descriptive, and to some extent a pilot, did

not commence from a highly specific theory base. The Ridley (2006) theory-base[11] evolved throughout the study, largely in parallel with the study, and somewhat influenced by the study.

A key study aim was to evolve and apply (and 'test') a process of evidence collection and review, for future extension and possible replication within the region and across the other world regions. This was to some extent in attention to past concern expressed (e.g. by Phillip Ein-dor in (Gable 2002)) with the lack of a methodology and indicators for tracking diffusion of the IS discipline. It was posited that the establishment of measures and indicators of the state of IS, and a baseline snapshot of its current state, will facilitate tracking of the state and monitoring the effect of initiatives to promote IS as a discipline. While emphasis here is on Australia, many of the ideas, mechanisms and aims are generalisable to all AIS regions. Thus, one overarching aim of the study is to contribute to a general methodology with which to describe and monitor the evolving state of the IS discipline in any region or country. Other more specific study aims included:

- To begin documenting characteristics of IS programs across universities in Australia.
- To begin documenting characteristics of IS research across universities in Australia.
- To begin assessing the strength of the IS presence in Australian universities.
- To evaluate the maturity of IS as an academic discipline in Australia (as per the theory-base).
- To identify emerging trends in IS in Australian universities.
- To identify main influences on IS in Australian universities.

STUDY QUESTIONS

Study questions and the units-of-analysis (sometimes the University; sometimes the State) too evolved over time, along with the study design, with varying emphasis across the sub-studies.
Broad study questions implicit in the final case study protocol[12] include[13] :

- What is the relative size of the IS presence at the University?
- What is the Administrative Placement of IS (including changes over time)?
- To what extent has IS at the university been impacted by local contingencies?
- To what extent is IS identified as a separate field at the university?
- What are the distinctive features of the IS Curriculum at the university?
- What are the distinctive features of IS research at the university?
- Who are the key people who have impacted IS in universities in the State?

Questions posed to within-state reviewers of the state reports included:

- What to you believe to be the main challenges facing the IS academic discipline in your State today?
- What do you believe to be the main opportunities facing the IS academic discipline in your State today?

Similar questions were posed to the global reviewers of the full set of related sub-study reports (the complete draft special issue of AJIS).

In concluding this section, it is noted that though each of the papers in the special issue of AJIS has been written to stand alone, the papers in combination form an interrelated set of rich descriptions (if partial), analyses and interpretations of the state of the IS Academic Discipline in Australia as of this writing. Detailed and more interpretive background and history is presented in the Historical analysis. The next section briefly reviews literature on past studies of the IS discipline and relevant theory. The subsequent section summarises the overall study approach, with emphasis on

repeatability - a key study aim. Next, overall study outcomes are related. The final section describes study limitations and potential further research.

THE LITERATURE

Past Studies of the IS Discipline[14]

Articles discussing the state of Information Systems tend to revolve around several themes: (1) the identity crisis within IS, (2) IS as an academic field, (3) the state of IS research, and (4) the evolution of the field of IS.

One dominant theme is the existence or not of an identity crisis within IS, concern being that the discipline's central identity is ambiguous (Benbasat & Zmud, 2003). Articles debating the core and scope of IS are several. The debate in recent times culminated in a series of 11 articles published in the *Communications of the AIS.* This is an important debate as the degree of convergence of a discipline can have political implications. 'Convergent communities are favourably placed to advance their collective interests since they know what their collective interests are, and enjoy a clear sense of unity in promoting them'. (Becher, 1989, p160)

The academic field of Information Systems is another recurring theme. Avgerou et al (1999) comprehensively discuss the academic field of Information Systems in Europe while other authors concentrate on a single topic. Topics of discussion include: the status of IS as an academic discipline (Introna, 2003; Khazanchi & Munkvold, 2000); IS educational programs (Ang & Jiwahhasuchin, 1998; Lo, 1989); and the location of IS departments in universities (Sherer, 2002).

Articles on the state of IS research include: paradigmatic and methodological examinations of IS research (Chen & Hirschheim, 2004; Orlikowski & Baroudi, 1991; Vessey, Ramesh, & Glass, 2002); regional differences in IS research (Evaristo & Karahanna, 1997); and themes of IS research (Bacon & Fitzgerald, 2001; Palvia, Leary, Mao, Pinjani, & Salam, 2004).

There are two types of article on the evolution of Information Systems: those that assess the current status of the field by tracing its historical evolution and the driving forces that shape it (Adam & Fitzgerald, 2000), and those that gauge the status of information systems development and evolution, by examining changes over time in topics, themes and research strategies in the literature (Alavi & Carlson, 1992; Claver, Gonzalez, & Llopis, 2000; Farhoomand & Drury, 1999).

RELEVANT THEORY

The study reported in this volume (IS-in-OZ) aims to investigate the state of the Information Systems academic discipline in Australia from historical and current perspectives, collecting evidence across a range of dimensions. To maximise the descriptive potential of the study, the results need to be capable of integration, so that the relationships within and across the dimensions and geographical units are understood. A meaningful theoretical framework helps relate the results of the different dimensions of the study to characterise the discipline in the region, and assist in empowering the Australian IS research community. The Ridley (2006) theory paper (paper #3 in the AJIS special issue) reviewed literature on the development of disciplines, before deriving a theoretical framework for the broader study reported elsewhere in this volume. The framework considered the current and past state of IS in Australian universities from the perspective of the development of a discipline. The components of the framework were derived and validated through

a thematic analysis of both the IS and non-IS literature. The framework developed in the Ridley paper, which has been partly guided by Whitley's Theory of Scientific Change (1984a, 1984b), was used to analyse data collated from the Australian regions. The degree of variation in Australian IS as an indication of its "professionalisation" and its maturity as a profession were used to frame the analysis.

STUDY APPROACH

Following, study logistics are described. The overall study design is reflected in Figure 2 above. Sub-study methods and methodology are addressed in the individual papers of the volume. Some details of the case study method are included below in order to avoid repetition across the 7 state case reports.

Overview

The study process was a combination of deductive, top-down broad definitions of aims, questions and procedures; and inductive, bottom-up consideration of sources of evidence, project resources and feasibility. It could be said that early results were mainly inductive, these being followed by a more deductive, top-down review.

Project Management - Individual State teams managed their respective case studies, with the overall project managed by Guy Gable (Project Leader) and Bob Smyth (Project Manager). Main mechanisms of project management were: (1) a project web site, (2) regular status meetings of the project leader and project manager and related project status reporting by email, and (3) face-to-face team meetings as feasible (on several occasions in conjunction with ACIS or ACPHIS). (4) Several teleconference and Skype sessions were also held, as a cost-effective alternative to face-to-face. (5) The case study protocol, too, served as a valuable mechanism for coordinating the study teams.

Complexities and Issues Encountered - A range of complexities was encountered throughout the study, some of which were fully or partially overcome; others of which were not. Several pertained to the scope and object of the study: academe vs the profession vs both; teaching vs research; past vs present; … There was discussion around the utility of 'state' based case studies, it being mooted that other groupings of institutions might be more meaningful e.g. Sandstones vs the others; large IS vs small IS (i.e. based on numbers of undergraduate IS students).

The State Case Studies

The case studies were largely exploratory and descriptive, with relatively lesser emphasis on interpretation and generalisability. The case study approach is well suited for investigation where there is little established theory on the topic (Yin, 2003). The case study method also has the advantage of allowing the researcher to develop a good feeling for the complexities of interacting forces and subtleties that are more difficult to detect with other methods. Walsham (1995) refers to the "rich insight" possible from the case study approach.

Topics Explored in the Case Studies - The data collected in the case studies concentrated on the following topics:

- Relative Size of the IS Presence at the University
- The Administrative Placement of IS (including changes over time)

- The Extent to Which IS at the University is Impacted by Local Contingencies
- The Extent to Which IS Is Identified as a Separate Field at the University
- Distinctive Features of the IS Curriculum at the University
- Distinctive Features of IS Research at the University
- The Key People Who Have Impacted IS in Universities in that State

Team Data Gathering - It was planned that team members in Australian states and territories (henceforth referred to collectively as the study 'states') would gather qualitative data about each university (as well as relevant state-level data). The case study method was agreed as the research approach for the team study. The data gathered was intended to provide insights into the distinctive characteristics of IS in each university in relation to: degree of administrative autonomy, size and influence, curriculum, research, local influences, and significant persons in shaping IS at that university. Anchoring the data gathering and analysis was Gail Ridley's (2006) evolving draft framework derived from theory on the emergence of disciplines. Team members in each state sought to analyse the data across the universities engaged in IS in that state, and to present general observations on the features of IS as an academic discipline in that state.

The Protocol - Yin argues for the use of a Case Study Protocol to guide any study employing the case study method. To this end, a Multi-State Case Study Protocol was developed for use by study team members. In this instance, it was intended that use of the protocol would contribute to:

- comparability across the States
- consistency across the individual case studies, and
- efficiency in the conduct of the case studies, with potential for data gathering and some analysis being delegated to research assistants or other junior researchers

Yin strongly favours building a protocol around relevant theory. In this study, the protocol relies on a framework, emergence of a discipline, developed by Ridley and articulated fully elsewhere in the AJIS special edition. In practice, the Ridley framework was refined in parallel with the data gathering and analysis for the individual state case studies. Thus, data gathering in most states was guided by a partial version of the final framework, incorporating two constructs: (1) degree of professionalisation as a discipline and (2) maturity as a scientific field. Both derive from Whitley's theory of scientific change (1984a, 1984b).

Also, many of the tenets of General Systems Theory (Ackoff, 1971) are implicit in the approach to data gathering and the themes and questions documented in the Multi-State Case Study Protocol. The approach to data gathering advocated, based on semi-structured interviews utilising broad themes to tap the perceptions of interviewees, is consistent with General Systems Theory. This approach permits the researcher to take a more holistic approach to the topic, and allows the interviewee to touch on the multiplicity of interacting factors that might contribute to the distinctive characteristics of the IS presence in each university. The protocol directs the researcher to just some of the potential interacting factors that might determine the distinctive characteristics of IS at a given university: that the interaction of geography, administrative structure, individuals from within and outside the university, over time may influence curriculum and research at that university.

Another assumption implicit in the protocol, supported by the work of management researchers and IS people like McFarlan, Nolan and Norton (1973), is that form influences function. The protocol suggests that to know the structure of the IS academic group and its position in the university's administrative framework is a good starting point for looking at the nature of IS curriculum and research at that university.

The case study protocol represents "the main research mechanism" for the seven case studies[15]. In its earliest draft, the case study protocol lacked an explicit theory framework. Instead, it relied solely on the principles of General Systems Theory and of form influencing function to guide the data gathering and analysis. This limited theory base was unsettling to some members of the study team. Consequently, at a study team meeting in Hobart, in December 2004, attention was given to deciding on a suitable, stronger theory base to underpin the case study protocol. The meeting agreed that prior work by team member Gail Ridley offered promise of a suitable framework for this study. Dr Ridley undertook to prepare a draft framework paper. In response to feedback from team members, this draft framework underwent several iterations, in parallel with modifications to the protocol and actual data gathering in several states. The form of the Ridley framework, as described elsewhere in this edition was finalised late in the data gathering process for the individual states. Hence, not all states were able to avail themselves of the full framework during the data gathering process but most chose to consult this latest framework in considering their analysis of the data gathered (It is anticipated that the framework will be of greatest use to researchers wishing to extend the Australian study in other regions).

Regardless, study team members from the different states chose to follow the protocol to varying extents. The study favoured an approach that maximised the capacity for the state team members to draw out the distinctive features of IS in universities in each state; thus, conscious deviation from the protocol was not discouraged where such deviations achieved the objective of highlighting distinctive characteristics of any state. This acceptance of deviation from the protocol was reinforced by the dynamic nature of the protocol, as the guiding framework evolved. In future studies it could be effective for all team members to reach consensus on the case study protocol prior to commencement of each study, with more uniform adherence to the agreed protocol.

The Queensland Pilot - To guide the direction of the state case studies, a pilot case was conducted in Queensland. The early version of the case study protocol was followed carefully in data gathering and analysis. In the initial Queensland write-up, additional contextual information was provided (e.g. explanation of the motivation for the single Queensland state study in relation to the larger Australia-wide study and the foreshadowed Pacific-Asia study) to enable the report to stand alone for review and reference purposes. The write-up of the Queensland pilot case study was then made available to Queensland interviewees and to all team members, across the states, for feedback. To the same end, the report of the Queensland study was made available on the team website. The pilot was subsequently discussed at a team meeting in Canberra. The approach adopted in the Queensland pilot was endorsed as appropriate for the other states. This pilot approach to the case studies proved an effective tactic.

Mechanisms to Increase Representativeness

Given the descriptive and exploratory character of the overall study, the team harboured no illusions regarding the ultimate completeness of issues to be identified, related evidence to be gathered, and analyses to be conducted. It was acknowledged that the study offers a mere starting point for ongoing monitoring of the state of IS in Australia. Regardless, efforts were made to achieve some level of representativeness of the evidence and perspectives reported. Key mechanisms were: (1) selection of the study team; (2) review of draft state reports by interviewees; (3) review of state reports by within-state experts; and (4) global review of the draft special issue by appropriate experts.

Selection of the Study Team - In establishing the study team, Australia-wide representation was sought. This suggested state-based case reports. Senior and long-standing IS academics were

approached, in most cases those first contacted welcoming involvement but with some changes to the composition of the team over the course of the study.

Review of draft state reports by interviewees - All interviewees received an early draft of the state report in which their views were recounted. Feedback was channelled through the project manager back to the state teams, and changes implemented by the state teams.

Within-state reviewers - In addition to careful review by state team members, interviewees, the project leader, and the project manager, each state report was given further local exposure in draft form prior to wider circulation to cross-case reviewers. Selected 'local experts' were sent a copy of the draft report for review, aims being to:

- Minimise potential adverse reaction from perceived misrepresentation
- Try to ensure the report is as representative of the State as possible
- Enrich the report with further insights
- Ensure that the process of peer-review results in papers of strong academic standard for publication in the special edition.

Global Reviewers - Two senior, and internationally active[16] and notable IS academics, Iris Vessey and Bernard Glasson, were sent a draft of the complete special issue and were requested to review the material and respond to a brief set of questions pertaining to the historical evolution of IS-in-Oz, the current state of IS-in-Oz and the possible future of IS-in-Oz. Aims of this survey included: (1) gather further insights, (2) account for diverse perspectives, (3) keep the study team accurate and seek balance (solicit third-party reactions to our areas of emphasis and our interpretations), and (4) maximise rigour.

Apologies for Omissions or Oversights - Though extensive measures have been pursued to ensure representative input to the special issue and a balanced report, resource and time limitations have constrained what is possible. While such a report will unavoidably reflect certain emphases and biases and choices made at all stages of its production, the team nonetheless apologises for any omissions or oversights. Given the desire that this study be replicated in future, feedback on any such omissions or oversights is all the more welcome.

Methodological action research

The overall study effort was compounded substantially by the intention to document the approach for repeatability. Mats Alvesson uses the term 'reflexive methodology,' referring to an evolutionary approach that aims to maximise the quality of study results. We prefer the term 'Methodological action research' (MAR) whereby, in addition to results in relation to research questions posed, the study seeks generalisable contributions to knowledge as regards the research process.

Thus, we sought to establish a highly systematised and proceduralised approach, readily extended and repeatable across other countries and regions (and publication collections - e.g. conferences or journals – see ACIS Archival Analysis in Figure 2). Note that there is a dotted arrow pointing up from the MAR oval in Figure 2, to a similar study at the IS-in-PA level of that Figure. This reflects how MAR learnings on the IS-in-Oz study have informed the parent study by evolving, recording and piloting various methods, mechanisms, concepts and interpretations. It is noted that several of the IS-in-Oz research instruments and approaches needed only marginal adaptation for the purposes of the IS-in-PA study.

STUDY OUTCOMES

This section summarises outcomes of the 12 sub-studies.

The Information Systems Discipline in Australian Universities: A Contextual Framework

The Contextual Framework introduces the IS-in-Oz study and the special issue, including background on study rationale and motivation, a summary of the study aims and conceptual design, and main outcomes. Contributions include a cogent synthesis of the literature on past studies of the Information Systems academic discipline. The approach described offers valuable methodological guidance for the replication and extension of the overall study approach within Australia, the region and to other world regions, and represents one of few attempts to methodically study the evolution of a discipline. With 18 core teams members in 12 sub-study teams, and in excess of 30 interviewees and a similar number of reviewers across Australia, the study too serves as a useful example of large-scale research project management. Most importantly, the contextual framework offers a meta-view of the underpinning sub-studies.

Key Aspects of the History of the Information Systems Discipline in Australia

Clarke (2006), referring to 3 main eras, offers cogent discussion on the evolution of the IS discipline in Australia, suggesting that it did not follow on from development overseas, but rather emerged in parallel. During the *Emergence Era* (up to 1965) a highly consequential Federal Government initiative was the Programmer in Training (PIT) scheme (from 1963), the syllabus of which emphasized systems analysis and design, and produced 100's of ultimately influential senior managers in both public and private sector.

Early in the *Establishment Era* (1965-1973), departments were created in 'Colleges of Advanced Education (CAEs) to assist practice with the application (particularly application development) of computers in business and government. In parallel, topics about 'how to apply the technology' began to emerge in university Accounting Departments, these being relatively more concerned with the 'information' than the system. The transfer of PIT to CAEs toward the end of this era heralded formalized IS education, which expanded to Institutes of Technology. Much of this early effort was service teaching, with IS in universities migrating forward from "undergraduate service topics and units to sub-majors, majors and only later postgraduate teaching and research" (Clarke, 2006).

At the outset of the *Consolidation Era* (1974-1990), "UNSW [University of New South Wales] appointed the first Professor of IS, Cyril Brookes, and formed the first university IS department … in 1978 the first Australian was awarded a PhD in IS (Ron Weber at Minnesota under Gordon Davis' supervision)" (Clarke, 2006). Ron Weber was the 2nd Professor of IS (in 1981) with several further such appointments in the late 80s and about 20 in the 1990s resulting in over 30 IS Professors by 2005. Early published curricula from the UK and US was too comprehensive and either too computer science or business oriented for the mostly IS service subjects being taught; 'local' IS curriculum thus sometimes became almost insular. Long awaited recognition of IS within the Australian Computer Society Accreditation Guidelines (Clarke and Lo, 1989) proved watershed, their Core Body of Knowledge in 1990 evidencing 50% IS content.

"Through the 1970s and the 1980s the vigour of the discipline in the USA resulted in that country establishing leadership in, and for many years even downright dominance over, the IS discipline" (Clarke, 2006). Philosophies and methods of research were debated through this period, with some acceptance of pluralism. Clarke, in Maynard (1992), depicts IS as occupying "space between the

technical and business disciplines, encompassing a range of applied and instrumentalist topics, and interacting closely with many other disciplines and sub-disciplines" (Clarke, 2006).

Clarke lists 7 main clusters of topics or themes in Australian IS since 1965 (with much cross-fertilization among the themes): i) technology as enabler and driver, ii) applications of technology, iii) data management, iv) organisations, v) systems thinking, vi) business school thinking, and vii) information management. The apparent diversity of both curricula and research domains being perhaps more varied even, than that of Europe or America.

Characterising Information Systems in Australia: a Theoretical Framework

Ridley's (2006) theoretical explorations are based in a review of the literature on the development of disciplines, ultimately deriving a theoretical framework for the broader study. The framework considers the current and past state of IS in Australasian universities from the perspective of the development of a discipline. The components of the framework were derived and validated through a thematic analysis of both the IS and non-IS literature. Other aspects of this study were described earlier in discussion on 'relevant theory'.

The 7 "State" Case Studies

The next 7 studies are "State" case studies, for: Queensland, ACT, NSW, South Australia, Tasmania, Victoria, and West Australia.

Case Study: The State of Information Systems in Queensland Universities - Data was gathered from all 9 universities in Queensland (including Australian Catholic University, which has common approaches in all its Australian universities), as all teach IS on at least one campus. The Queensland case study (Smyth Gable, 2006) was commenced and completed first, and is in closest accord with the protocol, it being intended as an exemplar for the other teams. While the study revealed little evidence of a distinctive Queensland-flavour of Information Systems it did find that the state of Information Systems in Queensland reflects the highly decentralised nature of the state. Relative to its population, Queensland has a large number of universities, each of which is engaged in Information Systems teaching and research. The study reveals little evidence of a distinctive Queensland-flavour of Information Systems. Rather, there is a diversity of curriculum approaches and an equally broad range of research topics and research methods. Two of the state's regional universities are notable for the relative strength of their IS presence, in terms of number of IS staff, number of IS students and range of campuses across which IS is taught. The breadth of topics and approaches to IS in Queensland is evidenced by the existence of separate, competing IS groups in each of two of the largest universities; in each case, one of the IS groups is highly technical in orientation while the other is Business oriented. Across the eight Queensland universities there is wide variability in terms of the administrative location of the Information Systems academic staff in the university structure. The study assesses the state of IS in Queensland universities in relation to criteria indicative of the maturity of a discipline. Measured against these criteria, Information Systems in Queensland universities cannot be considered a mature, distinct academic discipline.

Case Study: The State of Information Systems in ACT Universities (Gregor Lewis McDonald, 2006) - The ACT case study was prepared by three leaders in IS from the Territory's three universities. The report depicts a vibrant IS group in each university but voices concerns about the disparate administrative locations of the IS academics and the relative lack of strong identity for IS in the Territory's universities. IS is prominent at all three universities, each having a distinctive background that reflects its position in Canberra, Australia's seat of federal government. Australian

Defence Force Academy (University of New South Wales) is essentially a private university for the Australian Defence Organization; Australian National University was set up to be a national research institution; and the University of Canberra group for many years focused on meeting the training needs for computing professionals for the federal government. Despite these distinguishing characteristics, the subject matter taught and researched in the three groups has much in common and *"each group regards itself as 'vibrant' and happy with what it does"*. Nonetheless, a low degree of professionalisation is reported relative to longer-standing disciplines, it being suggested that this is to some extent due to there existing *"a disjunct between what is taught as core knowledge and what is taught as research methods, a lack of social prestige, and a lack of acceptance as a discipline with a unique symbol system"* (Gregor Lewis McDonald, 2006).

The State of IS in Australian Universities: New South Wales Report - The New South Wales report (Underwood Jordan, 2006) identifies 12 separate IS academic groups across 9 universities in the state. Unlike the other state reports, the authors choose to address only a subset of the NSW universities; those they consider more prominent in IS[17]. They observe that students undertaking strongly-identified IS undergraduate degrees, can be found at few universities, with most offering a variety of majors within other programs. The size of the IS presence would thus appear to depend upon the university's enrolment in the core programs that offer the majors and the extent of compulsory IS subjects in there programs. Large accounting programs mean that many students will need to do IS, thereby requiring larger IS staff numbers. Growing enrolments in Commerce over 2 decades has advantaged IS units and staff in that faculty. Nonetheless, IS would appear not to have a common home, but rather resides in a variety of locations, especially science and computer science. Most IS groups remain as ad hoc or informal groups within larger departments. While the universities reported by Underwood and Jordan (2006) display some structural recognition of IS as a separate field, it was widely held by their interviewees that the distinctiveness of IS was not well known in the wider university communities. Indeed the interviewees themselves appeared to hold diverse definitions of IS. Research activity tends to be fragmented and diverse. Small research groups, especially of doctoral students, have tended to exist without undergraduate programs to build the staff numbers to critical mass.

A Case Study: The State of Information Systems in Australian Universities South Australia Report The South Australia report (Koronios and Swatman, 2006) emphasizes the lead role of the University of South Australia. Data gathered suggest that the state of South Australia's IS offerings were heavily influenced during the 1990s by the soft systems and critical systems approaches to the discipline, a situation which began to change at the turn of the century; and that the curriculum depends more heavily on industrial than political factors. Though they report several substantive research centres or labs, it is also noted that there is little local funding for research, and while the three universities work fairly well together and have created some highly successful technical joint ventures, with IS playing such a minor role in the State, obtaining funding for any research activities is extremely difficult.

A Case Study: The State of Information Systems in Australian Universities – Tasmania Report - The Tasmania case study (Ridley 2006) is distinctive in several respects. Firstly, it reports on just one university. Also, the data gathering approach applied is somewhat different. Where reports in the other states used interviews from one or two senior academics in each university, in Tasmania it was possible to draw on data from a wide range of academics, both current and former staff members from University of Tasmania. The author of the Tasmania report is also the author of the framework developed for the overall case study protocol. The Tasmania case study findings suggest that an inverse relationship exists between the impact of local factors and the degree of

professionalism in this IS setting. A surprising finding was that the relationship found varied for research and teaching issues.

A Review of Information Systems Programs in Universities in Victoria - Victoria, more than any other state, was heavily impacted by the Dawkins reforms to Australian tertiary education (Pollard Chan 2006). Amalgamations, mergers and takeovers were widespread in Victoria, sometimes bringing together strong IS groups with different cultures and different aspirations. Though most interviewees expressed the view that local industry had had negligible influence on curriculum, universities in Victoria universally appear to be seeking increased collaboration with the local community and industry as part of their strategic direction. Distinctive themes taught within the many programs identified, varied considerably. Despite diverse topics of research being pursued, IS research output in universities in Victoria was perceived as lesser than in other departments. Efforts are however underway to bolster research output. Interestingly, the Victoria report states "The mode of IS research in universities in Victoria is predominantly interpretive. Only 1 university reported using 'multi-method, with an emphasis on quantitative techniques'." Although research is considered a high priority at almost all universities in Victoria, available funding appears to have a negative correlation with the avowed importance of research. Perceptions of "very little funding", "dwindling funding" and "having trouble attracting ARC and other external funding " were evident in the data.

Information Systems in West Australian Universities - The Western Australia report (Burn Standing, 2006) identifies a degree of isolation, attributable to the size of the state and relative remoteness from the universities elsewhere in Australia. The report suggests how these factors have impinged on development of IS in the state's universities and how response to local contingencies inhibits the perception of IS as a mature discipline. Research focus within the four Universities is very different and this may be one of the reasons that all interviewees identified the low level of collaboration between WA Universities. Interviewees stressed the real need for IS leadership and active involvement in IS research by the Professoriate. IS groups without a professor tended to have significantly lower profile in their home university.

Using Contradictions to Appreciate the History of I.S. Education in South Australia - This paper presents Metcalfe's (2006) interpretation of the history of Information Systems (IS) education in South Australia (SA). The stance used to think about the history was that of seeking the contradictions, underlying tensions, which worked over time to create the present. The paper argues that IS education in SA was influenced significantly by maintaining a "how to" view of teaching IS which failed to distinguish itself from the engineering worldview. After explaining the underlying tension stance this paper uses extracts from a long semi-structured interview with two seminal IS educators to support this argument.

The 2005 Survey of Information Systems Research in Australia - As part of a study to investigate the state of Information Systems research in Australia, a survey of the heads of all IS discipline groups in Australian universities was conducted in mid 2005 (Pervan Shanks, 2006). The study revealed a wide range of topics researched (with rapid growth in Electronic Commerce and Knowledge Management), a range of foci, a balance between positivist and interpretivist research; survey was the most frequently used research method, and most research was directed at informing IS professionals.

CONCLUSION

In conclusion, it is reiterated that this study is in many ways a pilot; the first phase of an ongoing, longitudinal and evolving analysis. Further, specific evidence collections in-progress are described below. Further, more in-depth analysis of that additional evidence in combination with evidence already gathered in this study, is planned.

As reflected in extant literature, due to its youth, IS has understandably been soul-searching for the past two decades. Information Systems as a separate academic discipline is relatively young and yet maturing. The extensive variation observed across the state case studies in both curriculum and research foci as well as placement and level of IS in universities in Australia further attests to it's formative stage of evolution.

Following are described: (1) the communication of study results, (2) further planned or in-progress research, and (3) study limitations.

Communicating Study Results

The main vehicle for communicating study results is the special issue of the Australasian Journal of Information Systems within which this paper appears. Methodological learnings from the IS-in-Oz study have been mostly held in abeyance until the special issue of CAIS wherein the combined learnings from the IS-in-Oz and IS-in-PA studies are reported. A consolidation of the Australian State case studies appears in the special issue of CAIS as the Australian State case study in the Pacific Asia Region multiple case study.

Further Research

As per Figure 2, and represented therein by unshaded ovals, three sub-studies that complement the results reported in this special issue have been commenced but are not yet completed. They are: (1) Methodological Action Research, (2) The IS Research Issues Survey, and (3) the ACIS Archival Analysis.

Methodological Action Research - The 'reflexive methodology' employed on this study, and the concomitant emphasis on repeatability, was described earlier. This effort is ongoing, overlapping substantially with the parent IS-in-PA study. Detailed methodological findings, including template instruments, will be reported in IS-in-PA special issue of CAIS.

The IS Research Issues Survey - In March of 2005 a global survey of issues facing IS researchers yielded over 800 responses. Primarily due to resource and time constraints, this data, though cleaned, has yet to be fully analysed and interpreted. This study is progressing and results are expected to be available in early 2007, though outside the timeframe of the AJIS special issue.

Australasian Conference on Information Systems (ACIS) Archival Analysis - In December 2004, at a meeting of the IS-in-Oz study team in Hobart, in conjunction with ACIS'04, enthusiastic discussion ensued on the possible value to the IS-in-Oz study from a careful archival analysis of ACIS proceedings across its existence. A key assumption here was that the research reported at ACIS is representative of IS research in Australia. A proposal was submitted to the Australian Computer Society (ACS), Information Systems Board, requesting seed funding for this activity. In May 2005 the funding was approved. Although the ACIS archival analysis is not complete as of this writing (and thus is depicted as an unshaded oval in Figure 2), it is worthy of note here as a

promising future source of insight into the ongoing evolution of the IS Academic Discipline in Australia. Also, preliminary work completed has yielded a useful profile of ACIS across its 16 year history.

Limitations

As acknowledged at various points in this paper, the study was a learning experience, a major aim being to evolve an approach that could be repeated across time and across regions; as such, its limitations are many, several of which have been specified throughout this paper.

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ACKNOWLEDGEMENTS

This study of The Information Systems Academic Discipline in Australian Universities has made significant demands on Queensland University of Technology (QUT), in terms of the time and efforts of Professor Gable, Dr. Robert Smyth and Ms. Karen Stark; the provision of the study team website; facilities for conferencing; and numerous other resources to support the project. I wish to acknowledge here my appreciation to QUT for this significant provision of resources to make the study achievable.

A project of this magnitude involves a large number of people. Many have contributed their valuable time to the study. In addition to the core study team members, we express our sincere thanks to: (1) State Report Reviewers, who reviewed a draft of one (or more) of the state case reports; (2) Interviewees, who gave of their time for evidence collection; and (3) Special Issue Reviewers. We offer our special thanks to the Special Issue Reviewers, who reviewed the complete special issue, offering ideas and advice particularly valuable and influential in the finalising of the papers. Thanks also to AIS for endorsing the study and for seed funding.

Finally, my personal thanks to Bob Smyth for his untiring support as project manager throughout the study duration. We could not have made it without him; his input throughout has been substantial. My sincere thanks also to Karen Stark, who crafted sections of the Overview; whose due diligence insured maximum accuracy and completeness; and whose meticulous eye introduced a level of presentation quality otherwise not possible within project scope.

ENDNOTES

[1] The author acknowledges the substantial contribution to this paper and the overall study from both Dr. Robert Smyth (project manager) and Ms. Karen Stark, both Senior Research Associates with QUT's IT Professional Services Research Program.

[2] To appear 2007

[3] The panel, titled 'Integrating the Global IS Academic Community: The Asia-Pacific Connection,' included Phillip Ein-Dor (then President AIS), KK Wei (then President-Elect AIS), and Ryutaro Manabe (PACIS 2002 Conference Chair) and others. During that discussion, Gable (2002) recorded thoughts on a possible multiple case study of the AIS Region3 - Pacific Asia Region (PAR), with the suggestion that AIS might be a sponsor. Early ideas were encouraged by Phillip Ein-Dor and KK Wei, who suggested submission of a formal proposal for consideration by the AIS Council at ICIS 2002 in Barcelona (Gable 2002). The then proposed study of 'The State of IS as an Academic Discipline in Pacific Asia' (IS-in-PA) was endorsed by AIS Exec in Barcelona and formally approved by AIS council mid-2003 to proceed on a smaller scale with 'seed' funding from AIS; that funding received end 2004. The study received subsequent strong endorsement from Rick Watson and Michael Myers.

[4] Note that Association for Information Systems (AIS) the main international association of Information Systems academics, organizes its activities around three world regions: (1) the Americas, (2) Europe, Africa and the Middle East, and (3) Pacific Asia.

[5] The study is currently being extended to Mainland China (in progress), Japan, India, Malaysia, Pakistan, and Thailand, for which tentative State study team leaders have been identified.

[6] The several articles of the special issue of AJIS have been consolidated in an Australian case study to appear in the special issue of CAIS, along with case studies of the five other States in Pacific Asia, and related sub-studies as reflected in figure 1.

[7] Felix Tan, Auckland University of Technology, who was then the elected AIS Region3 Council Representative.

[8] Each of these studies is briefly described later in this paper.

[9] Australia is made up of 6 states and 2 territories: NSW – New South Wales, SA - South Australia, QLD – Queensland, TAS – Tasmania, VIC – Victoria, WA – West Australia, ACT – Australian Capital Territory, NT – Northern Territory. Note that there little identifiable, substantive IS presence at any NT university as of this writing.

[10] As debated extensively in 2003 and subsequently. This was considered beyond the study scope.

[11] This paper presents a possible theory-lens for viewing the evolution of the IS discipline. It evolved in parallel with the study, and particularly influenced the multiple-case study protocol and cross-case and meta-analyses.

[12] Note that the state teams varied in their reliance upon the protocol.

[13] The protocol includes a long list of more specific questions, based around each of these broad questions.

[14] This section offers a very brief overview of past studies of the IS discipline. Individual articles in the special issue make more specific reference to relevant literature.

[15] Methodological learnings from the IS-in-Oz and 'parent' IS-in-PA studies are reported in detail in a special issue of Communications of the AIS to appear in 2007

[16] Though both highly active internationally throughout their careers, Bernard Glasson is now retired and Iris Vessey semi-retired.

[17] Some might disagree with their assessment.