

6. The information systems academic discipline in Queensland

Bob Smyth
School of Information Systems
Queensland University of Technology

Guy G. Gable
School of Information Systems
Queensland University of Technology

Abstract

Relative to its population, Queensland has a large number of universities, each of which is engaged in information systems (IS) teaching and research. As elsewhere, powerful external forces have wrought substantive change to the IS discipline in Queensland in recent years. The highly decentralised nature of Queensland has also had an enduring impact on the IS discipline in the state. Nonetheless, beyond several instances of adaptation to distance and decentralisation, the study reveals little evidence of a distinctive Queensland flavour of IS. Rather, there exists a diversity of curriculum approaches and an equally broad range of research foci and approaches to research. Two of the state's regional universities are notable for the relative strength of their IS presence, in terms of the number of IS staff, the number of IS students and the 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 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 nine Queensland universities there is wide variability in terms of the administrative location of IS 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, IS in Queensland universities cannot yet be considered a mature, distinct academic discipline. Profiles are presented of three people prominent in the development of the IS discipline in Queensland.



Figure 6.1 Location of Queensland within Australia

Introduction

For the IS community world-wide, this is a period of great turbulence. In 2002, there was an unprecedented downturn in demand for information technology (IT) skills, resulting in a sharp decline in student entry to university IT courses. Information systems courses have been among those affected by the downturn. The impact of the decline in demand for IS skills has been heightened by the fact that, unlike engineering for example, IT had never previously experienced anything but continuing growth. Indeed, in the years leading up to the IT downturn the demand for skills had been overwhelming, fuelled by the dotcom boom and the perceived Y2K crisis.

After the drop in demand for IS courses, there has been a major re-examination of IS. Old insecurities about the status of IS as a separate academic discipline have emerged. In universities in Queensland, as elsewhere in the world, IS curricula have been re-analysed with a view to repositioning IS in response to the fall-off in student demand. The changes to IS curricula have been accompanied in some instances by administrative restructuring of IS academic staff, driven by the goals of rationalising and economising.

In Australia, proposed Commonwealth government policy on research in universities has also had a profound effect on the IS discipline. The Howard government's proposed Research Quality Framework (RQF) caused IS groups in Australian universities to reassess academic staffing profiles and to reconsider research priorities.

In this setting of introspection and change, there is value in analysing IS in Queensland universities. From a position of soundly based understanding of the current status, and some feeling for how this status was arrived at, IS academics are better placed to plan to take advantage of emerging opportunities and to minimise the impact of identified threats to the IS discipline, to IS academics and to the programs of teaching and research guided by these academics. This chapter reports on such a study into the IS discipline in universities—in this instance, universities in the state of Queensland.

Purpose of the Queensland study

Queensland, one of the six Australian states, has a population of about three million people across an area roughly six times that of Britain. Brisbane, the capital of Queensland, has a population of about 1.2 million.

The Queensland study aims to document current characteristics of IS programs and research across universities in the state. As with the broader study, this one also seeks to assess the strength of the IS presence in the state's universities, to evaluate the maturity of IS as an academic discipline, to identify emerging trends in IS and to identify the main influences on IS in the state's universities. These aims are to be seen in the context of debate about what IS is and, significantly, whether IS can claim legitimately to be a distinct academic discipline.

The research method

The Queensland study utilises the case-study method. The specific case-study method applied draws heavily on the approach suggested by Yin (2003), incorporating some of the ideas of Walsham (1995). In particular, this version of the case-study method seeks an interpretive approach, directed at what Walsham calls 'rich insight'. Consistent with Yin's recommendation, the Queensland case study utilises a detailed case-study protocol. This protocol was developed by the Queensland study team members with input and consensus from all the Australian study team members. Major objectives of the detailed case-study protocol were to facilitate:

1. comparability across the states
2. consistency across the individual state case studies
3. efficiency in the data-gathering process.

The principal data-gathering method used in the case study was interviewing. Existing documentary and archival material was also gathered to supplement the interview data and to provide some triangulation of observations. The interviews were semi-structured, of about one hour's duration, with emphasis on broad perceptions by the interviewee on IS in his/her university, points of differentiation and distinctive features of IS in that university and in other Queensland universities.

Theoretical framework guiding the study

There is a body of knowledge that suggests that many of the characteristics of IS are consistent with those observed across emerging disciplines in the early stages of their development. For example, some of the characteristics that manifested themselves in the early evolution of management as a discipline have been seen more recently in the development of IS.

The framework proposed by Ridley (see Chapter 3) is based on two constructs: 1) the degree of professionalisation as a discipline, and 2) maturity as an academic discipline. Both are derived from Whitley’s theory of scientific change (1984a, 1984b).

The first construct concerns the degree of professionalisation of the discipline, which is expected to increase as the impact of local contingencies decreases. Where a discipline is not highly professionalised, local contingencies such as political pressures have a high impact. Consequently, the degree of professionalisation of IS can be indicated by the extent of variation in the nature of IS curriculum and research.

The second construct—maturity as an academic discipline—has two components: mechanisms of control, and a core body of knowledge. The framework proposes increasing maturity as a discipline being characterised by increased control and prestige, as well as increases in the core body of knowledge associated with the discipline. The core body of knowledge, in turn, is viewed as having four dimensions:

- a common set of research and teaching methods and standards
- a unique symbol system that allows the exclusion of outsiders and unambiguous communication between initiates within the discipline
- a coherent set of key research and teaching topics
- a set of laws, rules and evidenced guidelines—some form of theory base.

The universities in this study

Data were gathered from all nine universities in Queensland, all of which teach IS on at least one campus. The universities and the campus locations where IS is taught are shown in Table 6.1.

Table 6.1 Campuses of Queensland universities where IS is taught

University	Campus locations for IS
Australian Catholic University	McAuley College, Brisbane
Bond University	Gold Coast
Central Queensland University	Rockhampton; Bundaberg; Gladstone; Mackay; Emerald; (International Colleges: Melbourne; Sydney; Gold Coast; Brisbane)
Griffith University	Brisbane; Logan; Gold Coast
James Cook University	Townsville; Cairns; Mackay
Queensland University of Technology	Brisbane (2 campuses); Caboolture
University of Queensland	Brisbane; Ipswich
University of the Sunshine Coast	Sunshine Coast
University of Southern Queensland	Toowoomba; Wide Bay

Relative size of the IS presence in Queensland universities

In total size, three of the Queensland metropolitan universities—the University of Queensland, Queensland University of Technology (QUT) and Griffith

University—rank with the largest universities in Australia. The University of Queensland and QUT have total student numbers of about 40 000, while Griffith students number about 32 000. At the other end of the range, Bond University has about 2600 students, the University of the Sunshine Coast (USC) has about 3200 students, while the Queensland branch of the Australian Catholic University (ACU), McAuley College, has fewer than 5000 students.

In terms of the number of IS students and academic staff, and the extent of degree programs and research activities, the IS presence in Queensland universities is, not surprisingly, aligned roughly with university size: larger universities tend to have a stronger IS presence. Table 6.2 approximates the size of the IS presence in each Queensland university.

Table 6.2 The size of the IS presence in Queensland universities

University	No. of IS academics	No. of IS students
Australian Catholic University	< 5	< 100
Bond University	5–10	< 100
Central Queensland University	15–20	> 1 000
Griffith University	> 30	> 1 000
James Cook University	< 5	< 100
Queensland University of Technology	> 30	> 1 000
University of Queensland	20–25	> 1 000
University of the Sunshine Coast	5–10	100–200
University of Southern Queensland	25–30	> 1 000

The use of broad ranges in Table 6.2 serves to overcome inconsistencies in terms of who respondents deem to be ‘IS academics’ and ‘IS students’. In some instances, an IS academic might also teach subjects in related disciplines, or sessional staff might or might not be reported in full-time equivalents. Similarly, IS students might be seen by some to include only those students who are studying an IS major, or equivalent, while others will include all students studying even the equivalent of a minor in IS. The number of IS academics at a university is perhaps the better guide to the size of the IS presence.

In the two to three years leading up to 2006, the IS presence in Queensland universities was characterised by downsizing. After the global downturn in IT in 2002, all Queensland universities experienced a decline in demand for IS (and other IT) courses. With reductions in the number of full fee-paying students and in the number of international students, there was a decline in the revenue from these IS groups, thereby requiring a corresponding reduction in IS staff. Several Queensland universities offered voluntary early retirement packages to IT academics and associated professional staff as part of a strategy to reduce staff numbers. Although in 2006 there were some signs of a turn around and increasing demand from industry for IS and other IT graduates, by the end of that year this had not translated into a comparable increase in demand for IS places in Queensland universities. Several Queensland IS academics expressed the view

that demand for IS places in universities was likely to continue to lag behind the returning demand from practice for IS skills.

Regardless, it can be said that IS has a relatively strong presence in Queensland universities. One effect of the IT downturn appears to be that, at least in some Queensland universities, the impact on IS has been relatively less than that on computer science.

While the larger universities tend to have the larger IS presence, two regional universities that are far smaller than the three large Brisbane-based universities are distinctive for the relatively large size of their IS groups. At the University of Southern Queensland (USQ), the Department of IS is by far the largest of seven departments within the Faculty of Business, with almost 25 per cent of the faculty's enrolment. One interviewee stated that 'the Department of Information Systems [has] more students than the whole Faculty of Engineering'. While the relative size of IS at Central Queensland University (CQU) is not quite as great as at the USQ, it is still disproportionately large in terms of student numbers, staff numbers and the range of programs/courses offered, compared with the overall size of the university.

The USQ and CQU have long pursued a strategy of heavy emphasis on external studies (70 per cent of USQ IS students are external), a feature largely absent from the other Queensland universities. The consequence of heavy external enrolments, allied with a policy of setting up study centres in the Australian east-coast capital cities, means that only very small proportions of their IS students attend the home campuses of Toowoomba (USQ) and Rockhampton (CQU). The strength of external studies in IS at these two regional universities can be seen as a distinctive feature of the state of IS in universities in Queensland. The presence of IS classes away from the home campus, often in other states and commonly making up the bulk of IS enrolments at the university, is also notable.

The administrative placement of IS in Queensland universities

Across the nine Queensland universities there is remarkable variability in the administrative location of IS academic staff in the university structure. Table 6.3 shows, first, the administrative entity with which the IS academics at that university are affiliated. It should be noted at this point that it is common to find academics involved with aspects of IS across a range of departments, schools and faculties in a given university—for example, health informatics in a health faculty, IS auditing in a school of accounting, and so on. In this study, data were collected only on groups who self-identified as teaching and/or researching IS in each university.

A feature of IS in Queensland universities (perhaps not distinctive to Queensland) is that from late 2004 to mid-2006, many of the IS groups had either just

participated in restructuring or were about to begin a restructuring process. The CQU, Griffith, James Cook and USQ IS academics were about to begin a review process; Bond University IS staff members were involved in restructuring in June 2005 and QUT IS academics were in the midst of a restructuring. The downturn in demand for IT courses was cited as a major stimulus for restructuring.

It can be seen from Table 6.3 that five of the nine Queensland universities have IS academics in a separate school or department. A separate identity for IS might be associated with a higher level of academic control by the IS academics and with a higher level of prestige for the IS group. Interestingly, no two of these five universities use exactly the same terminology to describe their IS administrative entity. The remaining four universities—Bond, James Cook, the University of Queensland and the USC—have IS academic staff placed in administrative entities within other departments, schools or faculties. In these four instances, the administrative entities are identified as discipline groups.

Table 6.3 Administrative placement of the IS group in Queensland universities

University	Administrative entity	Home faculty
Australian Catholic University	School of Business and Informatics	Arts and Sciences
Bond University	Informal IS group within School of Information Technology	Business
Central Queensland University	School of Information Systems	Informatics and Communications
Griffith University	School of Information Communications and Technology/informal IS group in School of Management	Engineering and Information Technology/Business and Law
James Cook University	Informal IS group in School of Business	Law, Business and Creative Arts
Queensland University of Technology	School of Information Systems	Information Technology
University of Queensland	Information Systems Cluster in Business School; Data and Knowledge Engineering Division in School of Information Technology and Electrical Engineering	Business, Economics and Law/Engineering, Physical Sciences and Architecture
University of the Sunshine Coast	Information Systems Discipline Group in Faculty of Business	Business
University of Southern Queensland	Department of Information Systems	Business

In turn, the 'home' faculty for each IS group also shows some variability across the nine Queensland universities. At James Cook, Bond, USC and USQ, the home or parent faculty for the IS academics is business (or some variant of that title). At QUT, the home faculty for IS academics is a Faculty of Information Technology. Griffith University and the University of Queensland are distinctive in two respects in relation to the administrative placement of their IS academics: first, both universities are characterised by two separate IS groups. At Griffith, the smaller of the two groups is within the School of Management in the Faculty of Business and Law. The second, and larger, IS group at Griffith University is

distinctive in being administratively alongside engineering, in a Faculty of Engineering and Information Technology. At the University of Queensland, the larger of the two IS groups is in the Business School, while the second IS group, somewhat akin to Griffith, is within a School of Information Technology and Electrical Engineering. The placement of the IS group at the ACU within a Faculty of Arts and Science appears anomalous until it is observed that ACU has only three faculties, the other two being health and education.

In terms of independent status for IS groups in Queensland universities, there is evidence of two contradictory trends. On the one hand, at such universities as the CQU, Griffith and QUT, IS academics have moved into separate, identifiable schools of IS. On the other hand, at the USQ, a separate School of Information Technology, formed in 1990 to include IS and computer science, was broken up in 1993, with IS returning to the business faculty. Similarly, the Faculty of Information Technology at Bond University, which incorporated the IS group (and computer science), was disbanded in June 2005, with all IT being absorbed into the Faculty of Business as a new School of Information Technology. Thus, while some IS groups have been moving out of business faculties in Queensland, others have been moving back into business. The moves cannot be linked easily to broad outside forces; while the movement to business at Bond seems clearly linked to the decline in demand for IT, at the USQ the move back to business occurred at a time when IT demand was booming.

Sherer (2002) asserts that the theoretical basis of the discipline and the curricular needs of the professional community influence the organisational placement of the IS group. The assertion seems most plausible. If we assume that the theoretical basis of the discipline and the perceived curricular needs of the local community are two significant determinants of the administrative placement of IS groups, it is possible to make inferences about these factors from the differing placements in universities across the state. These inferences can provide useful insights regarding the maturity of IS as a distinct academic discipline. The administrative placement of the IS group is significant in relation to the acquisition, by the IS group, of mechanisms of power—a prerequisite for maturity of a discipline within the Ridley framework. This matter of the maturity of the discipline is analysed in a later section of the report.

Distinctive features of the IS curriculum

The Queensland universities offer a wide range of undergraduate and postgraduate IS courses/programs. Table 6.4 summarises the main IS courses currently presented in the Queensland universities. It is clear from the table that there is much variety in IS courses across the state. At the coarsest level of analysis, it can be seen that the IS courses bear a wide range of nomenclatures. Within these obvious differences in degree names, in the Queensland universities there is considerable further variability in IS curriculum content. One obvious

area of variability in curriculum content relates to the amount of 'technical' emphasis in different courses. At QUT and Bond University, for instance, at least 20 of the 24 units in the undergraduate IS degree course are from the Faculty of Information Technology. The IS units offered within the School of Information Technology and Electrical Engineering at the University of Queensland are characterised by the fact that every one of them has a technical focus. In contrast, the IS undergraduate degrees in the universities where the IS group is located within a business faculty tend to include a number (typically four to six) of compulsory business units. The same variability in IS curriculum content is to be observed in the course-work postgraduate IS courses across the Queensland universities.

Another aspect of the variability of IS curricula across Queensland universities is in the demarcation between IS and related discipline areas in relation to which discipline has curriculum responsibility for specific topic areas. For instance, at the CQU no programming subjects are controlled by IS staff; they are instead the domain of computer science staff. The CQU has, however, strong representation in its course curricula from such topic areas as management support systems and health informatics—topic areas covered by other faculties in some other Queensland universities. Topic areas such as database and data communications, as well as a range of web-related topics, are other examples of curriculum areas that lie within the ambit of the IS academic departments at some Queensland universities and, yet, with other departments at other universities.

The Ridley framework depicts the ready identification of a core body of knowledge—characterised in part by broad commonalities in the curricula of courses—as an important characteristic of a maturing discipline. It is clear from the data that in Queensland universities it is difficult to find evidence of consistency in the content of IS curricula across the state.

A phenomenon apparent in curriculum in Queensland, apparently in response to the overall decline in IT, has been an increased effort to develop courses closely aligned to the needs of business. For instance, at QUT during 2006 a Bachelor of Corporate Management degree was being developed for introduction in 2007. Similarly, at the USC a flexible new undergraduate IS structure, consciously aligned to the expressed needs of business, was being developed.

Table 6.4 IS courses in Queensland universities

University	Undergraduate courses/programs	Postgraduate courses/programs
Australian Catholic University	BIS	MIS
Bond University	BIS (discontinued after school's move to Faculty of Business) BIT (IS)	GradDiplIT MIT (Prof) MIT (Exec) MIT (Hons) MITM MEC
Central Queensland University	BBus (IS) BEC BIT (Bio-informatics)	GradCertIS GradDiplS Management MIS GradCert Health Informatics GradDip Health Informatics Master of Health Informatics PhD
Griffith University	BIT BBus (Commercial Comp)	MIT MIT (Advanced) MeCom MIS MIS (Advanced) MSoftEng MStrategicInfSysMgt PhD
James Cook University	BCom	MCom MBA-MInfTech PhD
Queensland University of Technology	BInfTech (IS)	BInfTech (Hons) GradDiplInfTech MInfTech MInfTech (Advanced) PhD
University of Queensland	BCom (IS) BBusMan (eBusiness) BInfTech	MCom (IS) MCom (eCom) MSc (Comp Sc) MEng MInfTech PhD
University of the Sunshine Coast	BBus (IS) BICT	GradDiplIS MInfTech (Research) PhD
University of Southern Queensland	BBus BIT	GradDiplInfTech GradDiplInfSys MInfSys MIT (Research) MIT (Prof) PhD

Distinctive features of IS research

As with IS curriculum, diversity is a feature of IS research in Queensland universities. Table 6.5 summarises major foci for IS research in Queensland universities and the organisational approaches to promoting research. Again, the diversity of topics highlights the breadth that appears to characterise IS. Once again, the research foci of the individual universities also do not appear to be related closely to geographical factors local to each university. Instead, the research areas appear to reflect the specific interests and skills of the academic research leaders. Again, there is evidence from some of the Queensland universities of a policy to focus deliberately on global IS issues in preference to purely local ones.

There is also no consistent pattern in the organisational approaches of the universities in seeking to promote and support IS research in Queensland universities. While some universities have established formal groups and programs and research centres, others—such as the two IS groups at the University of Queensland, which has a long tradition of research—rely largely on voluntary collaborations. Some of the groupings have a tight IS focus, while others—such as James Cook University—foster broad cross-discipline collaborations.

The diversity of research topics, research methods and administration of the IS research function in Queensland universities is at odds with the requirement, as expressed in the Ridley framework, for

- a common set of research methods and standards
- a coherent set of key research topics.

Again, this observation sees the IS academic field in Queensland failing to meet another prerequisite for the acceptance of IS as a mature discipline.

Table 6.5 IS research foci and groupings for IS research in Queensland universities

University	Areas of IS research focus	IS research groupings
Australian Catholic University	Business requirements definition; software quality assurance; management of IS; systems modelling and simulation	Individual
Bond University	Smart supply chain; business intelligence	Smart Enterprise Centre
Central Queensland University	Health informatics; group solutions (GDSS); teaching and learning; multimedia	No research centres; research clusters from across schools in the faculty
Griffith University	Software quality; packaged software; decision support systems; programming methodology; gender and IT; IS analysis, design, development and implementation; IS security; IS strategy; end-user issues; knowledge management; rural IS	Software Quality Institute; Institute for Integrated and Intelligent Systems; IS Group in Department of Management
James Cook University	People, identity and place: intellectual, social, economic and cultural dynamics; gender and IT	Collaborative; cross-faculty
Queensland University of Technology	IT professional services: knowledge management; enterprise systems success factors; IT sourcing; the management consulting process; information management in business processes; ERP life cycle knowledge management; business process management; workflow patterns; workflow tools; web service design and implementation	Centre for Information Technology Innovation: IT Professional Services (ITPS) Research Program; Business Process Management (BPM) Research Program

Table 6.5 IS research foci and groupings for IS research in Queensland universities

University	Areas of IS research focus	IS research groupings
University of Queensland	Ontological analysis; data quality; e-commerce; knowledge management; computer forensics; IT governance; mobile communications (security aspects); enterprise computing (workflows, etc.); spatial databases	Voluntary collaborative groupings
University of the Sunshine Coast	Knowledge management; data mining	Faculty Research Centre, SCRIBE
University of Southern Queensland	Eclectic: e-business; IS education; knowledge management; IS development methodologies	eBARC – Electronic Business Advisory and Research Centre, faculty-wide

A feature of IS research in Queensland universities has been the response by the IS groups to the Commonwealth government's proposed RQF. Interviewees frequently referred indirectly to RQF with statements about 'the new research environment'. While details of RQF had not been fully determined, the general thrust was a new approach to assessing and rewarding university research output. Beyond this, there was widespread conjecture among Queensland IS academics that failure to reach certain government benchmarks in research might be followed by a removal of government financial support for research at that university. The new Labor government announced in December 2007 its abandonment of the RQF, while foreshadowing a replacement mechanism for assessing university research. Information systems academic groups can be expected to adapt to whatever new mechanisms are put in place. Some changes observed among Queensland IS groups in response to the RQF proposals included the following.

1. Major efforts were begun to win competitive research grants, particularly Australian Research Council (ARC) grants. Universities where there had been little history of ARC grant applications were vigorously gearing up to make themselves competitive in seeking such grants.
2. New staff members with established research records were being sought. The understanding regarding RQF was that prior research publications would count in assessing current research output; so, 'buying in' established researchers was seen as a mechanism for immediately boosting the measured research output of the IS group.

3. Publication in conference proceedings, even of the most prestigious international IS conferences, was being eschewed in favour of journal publication. The understanding was that publications in conference proceedings would carry far less weight in the measurement of research output.

Key figures who have influenced IS in Queensland universities

Senior academics in IS in Queensland universities cite a wide range of individuals as having been significant to the development of IS teaching and research in their universities. In most instances, prominent IS academics in the early days of IS at the university in question were viewed as having had the greatest impact—for example, Ed Fitzgerald at the USQ.

Vignettes are presented in this chapter of just three of the many figures who have made major contributions to the IS discipline in Queensland universities. A vignette of Ed Fitzgerald provides an overview of his achievements and his contribution to the IS discipline in Queensland, most particularly through his contribution to IS curriculum at the USQ and more recently at the USC. Less commonly, outside figures were cited. At Bond University, British academic Frank Land, an early advisor to Bond, was proposed as a most influential individual. At QUT, it was John Puttick, a prominent IT proprietor and practitioner and chair of the QUT Faculty of Information Technology Advisory Committee. At the USC and the University of Queensland, Ron Weber was nominated as a significant influence because of his prominence internationally, along with Alan Underwood, another Queensland IS academic who made a significant contribution to the Australian Computer Society (ACS). Vignettes of Ron Weber and Alan Underwood are also presented here, as examples of leading figures in the development of IS in Queensland. Weber's contribution to research and scholarship in Queensland has been outstanding; Underwood has been the major contributor in the development of the largest IS group in Queensland universities.

Vignette—Ron Weber

Ron Weber had a major impact on IS in Queensland during his 25 years as an academic at the University of Queensland. In his final role at the University of Queensland, he was Professor of Information Systems in the School of Business and Research Director for the Faculty of Business, Economics and Law. In 2004, he was appointed Dean of the Faculty of Information Technology at Monash University.

Weber's first degree was a Bachelor of Commerce, in which he obtained first-class honours from the University of Queensland in 1972. After working as a programmer, systems analyst and project manager, he undertook his MBA (1975)

and PhD (1977) in Management Information Systems at the University of Minnesota. He had the privilege of having Gordon Davis as his advisor and of studying with a number of doctoral students who would go on to make major contributions to the IS discipline.

In 1977, Weber returned to Australia as Senior Lecturer in the Department of Accounting and Public Finance at The Australian National University. In 1979, he took up the post of Reader in Commerce at the University of Queensland. In 1981, he was appointed Professor of Commerce and, in 1988, he was the inaugural appointment to the GWA Chair in Commerce, which he held until 1993.

Weber has held visiting academic appointments at the University of Alberta, the University of British Columbia, the City University of Hong Kong, the University of Minnesota, Nanyang Technological University Singapore, New York University and the University of Otago.

His main research interests are in ontology (a branch of metaphysics), conceptual modelling, modelling of IS and IS management, auditing and control. He has published extensively in Australian and international journals, and many students and practitioners have used his book, *Information Systems Control and Audit*, internationally.

Weber is a Fellow of the ACS, the Institute of Chartered Accountants in Australia, CPA Australia, the Association for Information Systems and the Academy of the Social Sciences in Australia. In 2002, he was elected a life member of the Accounting and Finance Association of Australia and New Zealand. He was the first president from Region 3 of the Association for Information Systems. In December 2000, he was co-chair of the International Conference on Information Systems (ICIS). During 2001, he was chair of the ICIS Executive Committee.

His many awards include the University Medal (the University of Queensland), University of Minnesota Corporate Fellowship and the Prime Minister's Award for University Teacher of the Year (2000). In 1994, he won one of four Silver Jubilee Awards given world-wide by the Information Systems Audit and Control Association for contributions to the profession and the discipline of IS auditing. In 2000, he received the Accounting and Finance Association of Australia and New Zealand's inaugural Outstanding Educator Award and the Notable Contributions to the Accounting Literature Award.

Weber has worked on many editorial boards. He is a past senior editor for the *MIS Quarterly* and on, 31 December 2004, he ended a three-year term as Editor-in-Chief of *MIS Quarterly*—the first non-American resident to ever hold the position.

Vignette—Ed Fitzgerald

Ed Fitzgerald has 37 years' experience in the ICT industry, including 10 years working as a project manager/systems analyst/programmer, and 27 years in universities. His strong research background is supported by a PhD in IS strategic planning. He also maintains an active involvement in consulting in the public and private sectors.

In 1978—at a time when IS was still called data processing—Fitzgerald, along with two colleagues, began building what in the space of 10 years became the largest academic department in the USQ, the second-largest IS department in Australia at that time, and the first to offer IS courses by distance education. Starting with three data-processing staff providing 'service' subjects to a dominant (and domineering) accounting program, he led the establishment of a major in IS within the Bachelor of Business degree, then a Bachelor of IT, a Masters by course-work and a Masters by research. Always available to assist students and to explore ways of making possible what others said was impossible, he was nevertheless rigorous in his approach to academic standards in teaching and research.

Many of his students who now hold senior management positions in IT will tell you that Fitzgerald was demanding, but fair, and they still draw on key lessons learnt from him in his role as teacher and mentor. Some of those students benefited from the links Fitzgerald had established earlier when he was head of computer training in the Department of Defence in Canberra. At a time when IS jobs were few and far between in Queensland, Fitzgerald created Department of Defence opportunities, resulting in Canberra becoming home to hundreds of USQ IS graduates in the following years. Several IS professors will tell you how Fitzgerald also fostered their careers—encouraging them to enrol in Masters and PhD degrees, and supporting them personally and professionally through difficulties and successes.

After 25 years of managerial roles at the USQ ranging from foundation Head of the Department of Information Systems and Associate Dean (Academic) and Acting Dean to director of an e-business research centre, in 2003, Fitzgerald moved to the USC to take up the newly created role of Professor in Information Systems. Challenged to create in a new regional university an IS program that developed graduates with career opportunities equal to those of larger urban universities, he designed a degree with an 'industry studies' component that gave students the opportunity to target any one of the range of specific careers now available in the ICT industry. In the final four courses of the 12-course major, students select the combinations of internships, industry certifications and courses from other universities that deliver the career-specific knowledge and experience required for their chosen speciality. This innovative response is already being considered in some other Australian universities.

Fitzgerald is currently Dean of the Faculty of Business at the USC.

Vignette—Alan Underwood

Alan Underwood has been involved in most facets of the IT profession since starting out as a technical programmer in January 1967. After his recent retirement, QUT conferred on him the title of Emeritus Professor.

Underwood completed his first degree, a Bachelor of Business (Management), at Queensland Institute of Technology (QIT, the precursor to QUT) in 1974, while working in the industry as a programmer, systems analyst, project manager and operations manager. In 1975, he began at QIT as a lecturer in data processing. He completed a Master of Science (Management Information Systems) at Texas Technical University (1979) and an MBA at the University of Queensland (1982). After QIT's change to QUT in 1989 and an increased emphasis on research within the university, Underwood completed his PhD at QUT in 1995.

Until his retirement in 2006, Underwood was the academic and administrative head of the IS group at QUT, a position held almost continuously since his initial appointment as the Head of the Business Computing Section in October 1981. In 1983, Underwood helped create a new Faculty of Information Technology at QUT, which presented an opportunity to introduce an undergraduate degree in IS. Underwood's insistence on offering practically oriented IS courses with a business outlook, reflecting the needs of industry, was a catalyst for the excellent reputation that QUT enjoys today.

Underwood has always maintained strong links with the profession through the ACS; he was the national vice-president and president from 1988 to 1991. He served on the Queensland branch executive for 11 years in many capacities, including as vice-chairman and branch chairman from 1982 to 1985. Underwood was a member of the ACS National Council from 1984 to 1996, the National Technical Board Governor in 1989 and National Director of the Professional Development Board from 1995–96. He also served as the chairman of a number of national and international conferences including IFIP, ACC, SEARCC, ACIS and PACIS and he was a member of many national and international conference program committees.

Underwood is a fellow and an honorary life member of the ACS. During his term on the National Management Committee and as president, Underwood was instrumental in the society concentrating on professional issues. Consequently, the Practising Computer Professional (PCP) scheme was introduced in 1992 and a certification program was announced in 1993; both of these schemes still exist today.

Together with ACS colleagues, Underwood developed the core body of knowledge used by the ACS for the accreditation of IT courses in Australian institutions.

From 1988 until 2000, Underwood represented the ACS as a member of the Executive Council and as Assistant Secretary-General of the South East Asia Regional Computing Confederation (SEARCC).

In late 1988, Underwood, with a colleague from surveying, was successful in winning one of the first ARC grants awarded to QUT. His research interests now are in certification, professional ethics and IT project management.

The status of IS as a distinct discipline in Queensland

To analyse the status of IS as a distinct discipline, we turn initially to the two constructs from Whitley (1984a, 1984b) outlined earlier in this report viz. professionalisation and conditions for acceptance as an academic discipline. Where a discipline is not highly professionalised, Whitley argues that local contingencies have high impact. From the data collected in Queensland, there is little evidence of IS curriculum or research effort being focused on accommodating local community characteristics. Nonetheless, as has been pointed out in an earlier section of this report, within the Queensland universities there is high variability in curriculum content. It can be argued that this variability in IS content is attributable primarily to a specific local contingency factor. That factor is the IS leadership in each university. Even within a single university, sharp changes in curriculum content can be seen when leadership of the IS group changes. An example of this is the USC, where the curriculum moved abruptly from a focus on soft-systems approaches to a much more 'technical' curriculum after a change in the IS leader at that university. A similar phenomenon is evident in IS research in Queensland universities; research topics and methods at each university at any time can be seen to be dependent largely on the influence of a small number of key figures at that university. On these grounds, it can be argued, using the Ridley framework, that the IS discipline in Queensland is not professionalised. Clearly, local contingencies have a high impact.

Ridley's first component associated with discipline maturity is: increased influence over mechanisms of control. The evidence in Queensland is ambivalent on this. There are data pointing to IS groups in Queensland gaining a high degree of autonomy in teaching and research. Very often these highly autonomous groups are ones that have moved out of business faculties. In other instances, IS groups within business appear to have significant control over curriculum and research. On the other hand, there are data showing instances where, under the pressure of reduced demand for IT, IS groups have had a reduction in their autonomy. Further evidence of increasing control, power and prestige is reflected in more IS academics in Queensland achieving high status within their universities; there are a number of IS professors in Queensland now, where 20 years ago there would have been just one.

As observed in the earlier discussion on the IS curriculum in each of the Queensland universities, there is a lack of consistency across the universities with regard to subject areas that properly 'belong' to IS staff as opposed to staff from computer science, multimedia, business or some other academic group. This observation of the absence in Queensland universities of a core body of knowledge defining IS is consistent with the wider observations of Fitzgerald (2003). Fitzgerald concludes that the absence of such a core body of knowledge relegates IS to 'a subject with a particular perspective' rather than a discipline. Again, using the second indicator of discipline maturity in the Ridley framework, this diversity of curriculum, along with a comparable diversity in research topics and methods, further suggests IS is lacking maturity as an academic discipline. Nor was there evidence in the Queensland universities that IS possessed 'a unique symbol system'—in other words, a distinct language of its own, which differentiated it from related discipline areas.

Review of findings

While the study pointed to a considerable diversity in IS across the nine universities in Queensland, there was little evidence of sharply different 'philosophies' of IS, as was reported from a survey of IS in 18 European countries (Avgerou et al. 1999). The European study had, for instance, highlighted the strong socio-technical stance of the Scandinavian countries, in contrast with a pragmatic technical emphasis in German universities. In the curricula and research emphases of the Queensland universities there was evidence of an eclectic melding of the various European and American approaches. Only at the University of Queensland and at Griffith University—both of which maintain two strong IS groups, one 'technical' and the other 'business-focused'—is this blending of approaches to IS not in place in a single administrative unit.

In relating the Queensland data to Ridley's (2006) framework for assessing the maturity of IS as a discipline, it has to be said that the evidence from Queensland universities does *not* fully support IS being recognised as a mature discipline. Certainly, the data suggest that the IT field in Queensland is characterised as being subject to the high impact of local contingencies. According to Ridley's framework, this characteristic is typical of a field lacking a high degree of professionalisation.

Ridley's first criterion for maturity as a discipline—that those in the discipline have a high level of control, associated with the potential for prestige and power—would appear to be met at least partially. At several of the Queensland universities, where senior IS academics are recognised by their universities as Professor of Information Systems, these individuals are recognised, by virtue of their achievements in IS, as warranting the same prestige and decision-making power in the university as their colleagues in long-established disciplines. Similarly, the control that comes with increased autonomy is evident in many

Queensland universities, where IS academics have significant control over resources, IS curriculum content and IS research.

In relation to the second maturity criterion—that there should be evidence of a core body of knowledge for that discipline—the Queensland data indicate that no such clear core body of knowledge is identifiable. Information systems curricula are very diverse across Queensland universities, as are IS research topics and methods. Further, as reflected in debate within the wider IS community, there is little evidence in Queensland (or elsewhere) that IS yet possesses the ‘theory base’ that is also among Ridley’s indicators of discipline maturity. Again, in relation to Ridley’s criterion of a unique symbol system that allows the exclusion of outsiders and unambiguous communication between initiates within the discipline, there is limited evidence from the data to suggest that IS academics in Queensland share such a common unique symbol system. The wide variability in curriculum content and research foci would alone argue against this unique basis for communication among the IS academics.

In summary, the features of the IS activities observed in Queensland universities have much in common with features reported by Whitley (1984a) in relation to the early stages of the development of management as a discipline area viz.

- a heavy reliance on reference disciplines
- a paucity of theory specific to the discipline
- a perceived lower status than for established disciplines, leading to the adoption of methods from the higher-status disciplines
- limited numbers of textbooks that review the discipline
- poor definition of the boundaries of study
- incorporation organisationally as a subset of an established discipline.

Whitley uses the term ‘fragmented adhocracy’ to describe this immature stage of the development towards a distinct discipline.

The existence in each of two Queensland universities of separate IS groups, under the administration of different faculties and with quite different curricula and research foci, highlights the relative immaturity of the IS discipline in Queensland. Nonetheless, evidence of recent collaboration and cooperation between these previously rival IS groups suggests progress in this pursuit of discipline maturity.

Limitations and future research

The Queensland study draws only patchily on historical data related to the development over time of IS in the nine Queensland universities. In some universities there were historical data readily available, while in others there were not. Where historical data were available to the researchers, there was a richer context for analysis to understand the current situation. The value to the

researchers of such limited historical data as were available points to improved insights from an extension of this study, incorporating a fuller historical analysis.

A feature highlighted in the execution of this study was the dynamic state of IS in Queensland universities at the time of the study. The study therefore represents a snapshot of a rapidly changing scene. To capitalise on the findings of this study, there is an imperative to replicate it over time. A longitudinal view of IS in Queensland will tell much about the progressive maturing of IS as a discipline. In particular, it will be of great interest to see how the IS discipline in Queensland is influenced by the apparent resurgence in demand for IT skills. The Excellence in Research for Australia (ERA) which replaces the RQF, has the potential to very much change the nature of IS research and the methods of communicating research findings.

General findings from the Queensland study

In conducting this Queensland study, there was recognition by the researchers of the intention to reflect on the procedures followed and the outcomes achieved; this and the other Australian studies were to inform subsequent, broader studies into the IS discipline. A similar study into the IS discipline in universities in the countries of the IS Pacific-Asia region is in progress, drawing to some extent on the Australian experiences. It is envisaged that similar studies of the IS discipline be carried out in other regions of the world. This might ultimately allow a useful global analysis of the discipline, highlighting regional similarities and differences.

A useful finding from the Queensland study relates to the approach to data gathering that was proposed in the study protocol. The intention was to have interviews with at least one key person from each university in the state as the prime source of data. These interviews were planned to take about one hour each. In the event, arranging face-to-face interviews at two of the Queensland universities proved impractical. For James Cook University and the ACU, telephone interviews were used, followed up with interview notes and other exchanges by e-mail between the researcher and the interviewees.

For future studies elsewhere, a revised study protocol has been prepared to accommodate telephone interviews. In addition, in recognition of the large time requirements for interviewing where there are many universities involved in the study, a survey instrument has been prepared as a substitute for each interview. The instrument attempts to provide some of the richness of an interview by minimising questions seeking specific numerical responses, in favour of questions teasing out the distinctive characteristics of the university. In recognition of a study environment in which, on the other hand, there are very few universities in the study, a guideline for conducting focus groups, based on the standard data-gathering framework, has been added to the study protocol.

The use of a theory framework to guide the data gathering and analysis, based on 'the emergence of a discipline', proved most helpful to conducting the Queensland study. It is envisaged that the Ridley framework will prove valuable to similar future studies.

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