

**THE STATE OF INFORMATION SYSTEMS IN AUSTRALIAN UNIVERSITIES –
SOUTH AUSTRALIA REPORT**

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ABSTRACT

This paper examines the status of Information Systems (IS) at the University of South Australia (UniSA). On a broad scale this study is part of a larger Case Study regarding the state of the IS Academic Discipline in Australasian Universities but, in view of the fact that Information Systems degrees are offered only at one university within the State, the South Australia study, by definition, becomes a study of that university. The paper clarifies the role of IS within UniSA, with particular reference to the degree of professionalism and the impact of local contingencies on IS teaching and research. Data were gathered by means of qualitative surveys with present and former academics of the institution, as well as via statistical information. The results 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 is depends more heavily on industrial than political factors.

INTRODUCTION

This paper reports on the status of Information Systems (IS) discipline at the University of South Australia (UniSA). Although there are a number of other tertiary institutions in Adelaide, none of these offers degrees in Information Systems. Carnegie Mellon University has not yet begun to offer its very high-cost degrees and, while there are degree programs at the other two major South Australian universities (Flinders University and the University of Adelaide) which could be seen as targeting a similar market, closer observation shows that none of these degrees is either an Information Systems degree, or focused on the same likely employment outcomes:

- Flinders University offers a Bachelor of Information Technology degree, which has definite similarities with UniSA's Bachelor of Information Technology program – both these degrees focus primarily on IT, rather than IS, and offer a 'half-way house' between Computer Science and Information Systems;
- Flinders Bachelor of Arts (Geographical Information Systems) program offers students taking an Arts degree the opportunity to include a major sequence in the area of GIS. This might be seen as a possible attraction for students considering an IS degree, but is a rather more specialised offering;
- The University of Adelaide offers a Bachelor of Business Information Technology which has many similarities with UniSA's Bachelor of Business (Information Technology) hybrid degree – both these degrees offer Commerce/Business students an IT/IS major in a business-focused degree. The major difference between them is that the University of Adelaide's offering has significantly more Computer Science and less Information Systems than its UniSA equivalent.

This case study, therefore, was undertaken by academics of UniSA only. This study draws upon the theoretical framework outlined in Paper 3 in this volume and is therefore not restated in the present study. This review of the South Australian experience of Information Systems education is a one of a series of similar studies undertaken in each Australian state, the Australian Capital Territory and New Zealand; each of which is reported separately in this overall review.

UniSA was founded on 1 January 1991 through the amalgamation of the South Australian Institute of Technology and the Magill, Salisbury and Underdale campuses of the South Australian College of Advanced Education. Since then, it has quickly earned a reputation as a national leader in collaborative research, has been recognised nationally for innovation in teaching and has South Australia's largest intake of international students.

Number full-time equivalent students	Number full-time equivalent IS students	Number of Academics teaching IS
21,304	Of the total students in the School of CIS (1677), approximately 450 are enrolled in IS courses	10 + sessional staff

Table 1 – Summary Statistics of UniSA

RESEARCH APPROACH

The UniSA study is based on the positivist case study method (Yin 2003), enhanced by statistical data drawn from the University's internal and external data gathering. Case studies of this type, as in the present case, frequently make use of a detailed case study protocol – which was developed by the Australasian study team members to ensure consistency of data collection across the universities studied. Major objectives of this protocol were to facilitate:

- comparability across the States,
- consistency across the individual State case studies (not relevant to the South Australian situation); and
- efficiency in the data gathering process.

While some staff members contributed their material during interviews, the majority of responses were gathered by means of email questionnaires, which were filled in by staff and returned to the authors for analysis and review. Existing documentary and archival material was also gathered to supplement the interview data and to provide some triangulation of observations.

Data gathered from interviews and questionnaires were then analysed using thematic analysis, so that qualitative data collected from participants and quantitative data collated from other sources could be integrated more effectively (Boyatzis 1998; Constat, 1992; Dixon-Woods, Agarwal, Jones, Young and Sutton 2005). The themes which formed the basis for this analysis were primarily those of the overall study's theoretical framework (reported in Ridley (2006)) and are therefore not specifically related to the UniSA environment, but rather designed to provide comparability across States within a national study.

The discussion which follows was, as has already been noted by the Tasmanian study "weighted towards themes that appear to have a high level of explanatory value", rather than reflecting how frequently the themes were reported (Dixon-Woods et al. 2005, p. 47). This similarity with the Tasmanian study is particularly apt, in that both UniSA and UTas are the only universities in their respective States teaching Information Systems – although the parallels are not complete, as UniSA is one of three South Australian universities which could potentially choose to teach this material, while UTas is the only university in Tasmania.

A quite separate study of three retired staff members, which provides a unique view of UniSA during the last two decades of the 20th century, is published as a separate paper within this series. The present paper focuses on UniSA's Information Systems activities in the 21st century and, in particular, the ways in which the University is evolving subsequent to the major re-organisation which saw the Information Systems discipline move from the Division of Business to become a part of a broader School of Computer & Information Science within the Division of Information Technology, Engineering & the Environment.

OVERVIEW OF SIZE AND PRESENCE OF IS AT UNISA

The School of Computer and Information Science is located within the Division of Information Technology, Engineering and the Environment and has existed for the life of the University. During 2004, a review of the Division of Business resulted in the restructuring of Schools within that Division and the IS discipline, which was at the time located in the School of Accounting & Information Systems, was transferred to the School of CIS – a much larger School. This merger has resulted in a large and vibrant computing School with a wide variety of programs, covering the full range from Computer Science, through Software Engineering and Information Technology to Information Systems.

The University was founded in 1991 and, at that time, some members of antecedent organisations decided to form a School of Information Systems within the new Business Division. Some of these staff members came from the Institute of Technology, while others had previously been a part of the SA College of Advanced Education:

We had all been in Business Schools teaching IS topics. We believed it worthwhile to have an IS concentration and develop the area academically as it was useful for the uni and the citizens of SA. At the time IS had quite a high profile. I was a founding member along with approx 21-23 others. We were the first and only School of Information

Systems in SA. Flinders university had nothing in the way of IS and Adelaide university had one subject in Computing Science. We developed a range of undergraduate programs which were very well received.

In 1996 the University reduced funding to the School, which resulted in staff cuts and redundancies. In 1996 there were cuts across the Business Division of which IS was a part and staff were advised that the annual budget had been reduced from \$2.8 million to \$1.8 million. The group had significant financial problems at the time, although it had developed a successful industry placement program with about 40 industry partners and earned a very positive reputation for its engagement with industry.

At least one respondent (now retired) believes the group had a mixed relationship with the Division of Business from its inception, claiming that there had been several attempts to move them out of the Business Division. The group was for most of its time located in an Accounting and IS school which also had a group from the administrative management area. Although some feel that the group is now smaller and less visible, it now has three full-time IS professors, in addition to two European Adjunct Professors and an Associate Professor who are also IS-focused; and launched a Bachelor of Information Systems for the first time in its history following the merger (and a complete revamp of all degree programs offered by the School).

Placement of IS

The merger allowed UniSA to rationalise the location of IS staff. Originally, the majority of the University's IS teaching staff (12 academics) were based in the School of Accounting and Information Systems at City West campus, which was composed of three discipline areas: Accounting, Information Systems and a group known as Administrative Management (AM), which had originally taught secretarial studies and was slowly evolving towards a new focus on the management of corporate administrative functions. Some of the IS courses (those courses having a prefix of INFS) were taught by AM staff; and some of the AM courses were taught by IS staff. These blurred lines of control had simply evolved over time, but were rationalised at the time of the merger.

During the merger discussions, 11 of the 12 IS academic staff agreed to move to the new School and 1 of the former AM staff also decided to move to the School of CIS. Prior to the merger, some 5 IS academics had been located in the 'old' CIS at the Mawson Lakes campus in the north of Adelaide; and their courses became a part of the revised degrees offered by the enlarged, combined School.

The majority of the IS teaching takes place at the City West campus of UniSA, where most of the IS staff are still located, with some (predominantly graduate) IS courses also being offered at Mawson Lakes.

Undergraduate courses offered		Postgraduate courses offered		No. students enrolled in IS subjects
DBBI, DBIN, DBMS	DBEB, DBIT,	DCMI, DGMI, DMIS, LMCT	DGEC, DMEC, DMMI,	450 approx.

Table 2 – Coursework offerings within the School

HOW MUCH IS IS IMPACTED BY LOCAL CONTINGENCIES

Although the curriculum is affected by industry requirements, the School also attempts to be an industry leader instead of only responding to industry demand.

Local demand does affect IT and IS teaching structure within the State, particularly what is taught, because students must have certain skills to be employed by local and inter-State businesses. It is probably no more affected by industry than other applied disciplines, such as tourism or oenology, however.

UniSA has made significant structural changes which affect the teaching of IS – specifically, the move of the IS group from the School of Accounting & IS within the Division of Business to the School of Computer & Information Science within the Division of IT, Engineering & the Environment. This has enabled the development of a Bachelor of IS degree (IS was formerly offered only as one alternative within the Bachelor of Business degree). As the only university in South Australia offering IS, there is little (if any) political pressure on the School to make any particular offerings, although the BBIS/MBIS program (a funded joint program with industry which takes high performers and fast-tracks them via a combined academic/industry placement scheme) has had an influence on academic outcomes, as most of the brightest students choose this alternative in place of doing an Honours degree.

Like all other Australian (and overseas) universities, UniSA has suffered from the ICT downturn in terms of local student numbers. Employment in South Australia in the ICT industry is extremely difficult and the current State government's decision to outsource all major ICT developments to inter-State and/or international companies has made this situation still more difficult. Many of our graduates are forced to seek work in other States, so that we are probably suffering more from the downturn than any other University in the sample. Recent moves to source staff for major Commonwealth Government projects from South Australia are likely to have a positive impact on student placements, however, and have been warmly welcomed by the University.

Recent events, such as the large defence contractor presence in South Australia and the SA Government's MOU to invite the defence studies arm of Cranfield University and the public policy and ICT programs of Carnegie Mellon University, have the potential to be advantageous to the IS programs at UniSA. It is not entirely clear whether the potential benefits of these changes will eventuate, however, as the South Australian government does not have a single focus on the ICT industry. South Australia has six Ministers who share parts of the ICT portfolio – making it difficult to produce a considered and consistent government response to any new initiative.

The School has an industry advisory group which has been very supportive of IS programs and has an excellent reputation with local business and with the public sector.

TO WHAT EXTENT IS IS IDENTIFIED AS A SEPARATE FIELD

IS was acknowledged as a separate field when it was part of Business but is less clearly separated now that it is part of a large, combined computing School. As part of the Business Division, the IS group had perforce to teach all aspects of computing, so that there were staff who taught programming and other more technical subjects. These subjects have now been rationalised and are

generally taught by the more technical SE and CS staff (although this is not entirely the case – some of the programming courses are still taught by IS staff at City West).

Both in its former existence as part of the School of AIN and in its current existence as part of the School of CIS, IS at UniSA has been a component of a larger School. It has been many years since there was a School of IS at UniSA. To a large degree this can be traced to the comparative lack of local student interest in IS – the fact that neither the University of Adelaide nor Flinders University even bothers to offer IS at all provides further evidence for this atypical lack of interest, which pre-dates the current IS student crisis.

The move from the Business Division to the Division of ITEE has forced the UniSA IS group to think very carefully indeed about the composition of its degrees. The School of CIS went through a complete degree restructuring in 2004/2005 and now has an entirely new suite of offerings right across the field of computing: CS/SE/IT/IS. The School has also had to distinguish its offerings very carefully from those of Administrative Management, which teaches some material offered by IS in other universities – so awareness of the School's specific role in the computing spectrum is probably better and more finely focused than at other universities.

Research in IS is led by the three IS professors and their research groups, as the majority of the other IS staff have still to complete their doctorates. The foci are: requirements engineering/CSCW and Electronic Business / Business Information Management, which are wide enough to include any members of staff interested in becoming involved in the Information Systems Laboratory (InSyL).

In terms of winning Australian-based competitive grants, it is obviously much more difficult for IS academics than for CS academics in Australia – especially since the creation of NICTA, which absorbs the lion's share of the Australian IT research funding.

DISTINCTIVE FEATURES OF IS IN CURRICULUM AT UNISA

The School of CIS endeavours to offer a suite of offerings which cover the entire computing spectrum, from CS right through to IS. Our degree programs, therefore (both at UG and PG level), offer a wide range of options.

Incentives for both teaching and research are excellent. Indeed, the School of CIS at UniSA rates itself well above average in terms of providing incentives for research.

The newly-developed Bachelor of Information Systems is a broadly-based degree, with specialisations possible in a variety of more finely targeted areas. At the graduate level, the School offers both conversion Masters degrees, which are extremely popular with international students, as well as an advanced Masters degree in IS. We are also developing a range of double degrees – both with the Business Division in areas such as Accounting and Marketing; and with the Health Studies and Education, Arts & Social Sciences Divisions. Identifying niche markets is a major focus of the IS strategic planning and is likely to become increasingly important over time.

A major new venture has been the industry-funded Chair of Business Information Management, which was established within the School at the start of 2006. Funded by the State Library of South Australia, State Records SA (a division of the Department of Administrative and Information Services) and Fuji Xerox, the Chair is based on the awareness that the previously separate disciplines of library management, preservation, records and archival management and ICT are

becoming increasingly inter-twined. The sponsors have funded the development of a suite of new degree programs which will provide a holistic approach to the impact of all these areas on the management of business information.

DISTINCTIVE FEATURES OF IS IN RESEARCH AT UNISA

The School has a very large PhD student population, of whom 17 are specifically IS students. As is the case in so many Australian IS Schools/Departments, lack of sufficient numbers of PhD supervisors is a limiting factor. Qualified supervisors therefore tend to have the maximum number of PhD students permitted by University regulations – although this lack is slowly becoming less critical, with a number of PhD graduates obtaining teaching positions within the School and taking on supervisory roles themselves. This has been especially beneficial within individual research laboratories, as newly-qualified staff members expand both the supervisory capacity and the laboratories' ability to develop grant applications.

The School has one major research 'centre', which is funded by the University to support research activities: the Advanced Computing Research Centre (ACRC) which, in turn, supports a number of research 'laboratories' (the term is taken from MIT's approach to grouping researchers). Inevitably, there is some overlap between the activities of many of these laboratories, but two of them are primarily IS-focused – the Information Systems Laboratory (InSyL) being a solely IS-focused 'broad church' group; and the Strategic Information Management Laboratory (SIML) being strongly IS-focused. There are two further laboratories (Health Informatics and Enterprise Security) which have at least a partial IS focus and some interaction with the IS group. The table below summarises the research foci of the two major IS research groups.

School of CIS Information Systems Research Laboratory Foci	
InSyL	SIML
Socio-organisational systems	Data acquisition
Business Information Management	Data quality
Education	Interoperability standards
E-Business/E-Commerce	Knowledge management
Decision support and KM	Data warehousing and data mining
IS methodology	Data security

Table 3 – Research Group Foci within the School

There is a lack of local funding for research in any area of computing within South Australia, although the three universities work fairly well together and have created some highly successful technical joint ventures (the SACITT group, and the SABREnet initiative, for example). With IS playing such a minor role in the State, obtaining funding for any research activities has proven extremely difficult (although, as noted a little later in this paper, individual academic staff members have been able to build up 1-on-1 relationships at various levels of State and local government; and thus obtain focused funding for specific projects).

Lack of a single ICT Minister at the State government level adds to this problem. As already noted, South Australia has six ministers responsible for various aspects of ICT, so that there is little consistent policy on any part of the ICT research or practice spectrum. This makes is very difficult

to deal with the State government at a strategic level – relationships exist between individual government agencies and individual institutions (and even individual academic staff members). Despite this impediment, however, the School has been highly successful in building 1-on-1 relationships which have led to significant funding opportunities.

The ‘branch office’ status of Adelaide means that developing strategic relationships with private sector companies is also very difficult. Most of the School’s partner companies must refer all decisions to their HOs, usually located in Sydney or Melbourne. Research partnerships with industry therefore tend to be focused on innovative SMEs, rather than on larger companies – as is common for universities in other States.

Given the current lack of funding at the State and federal levels (with NICTA absorbing almost all the federal ICT funding, it is increasingly difficult to obtain government funding for IS within Australia at all), other avenues of research funding must be found. Industry support is the logical place to look, as well as less obvious sources of government funding (targeted funding of one sort or another). This approach is beginning to bear fruit for the School.

CHARACTERISTICS OF IS IN THE STATE

South Australia has a number of very innovative and successful smaller businesses working in the ICT sector. This, combined with the lack of larger companies in the area has created an unusual profile in the State. Even EDS, which had a sizeable representation in Adelaide under the former government, having won a contract to handle all government ICT outsourcing, has now ‘right-shored’ its operations to a significant extent following the current State government’s change of its outsourcing policy (all government ICT activities are now outsourced to inter-State and offshore companies).

The major ICT group within South Australia is, of course, the defence industry. The decision to build the ‘smart ships’ in Adelaide has bolstered the existing activities of many high-tech defence companies which had been working with ASC (formerly the Australian submarine corporation) on the development of the Collins Class submarines.

KEY PEOPLE WHO HAVE IMPACTED THE IS CURRICULUM AT UNISA

A number of industry players have had an influence on the IS curriculum over past decades and, of course, past and present Heads of School have also had an impact – Terry Robbins-Jones was particularly influential during the 1990s. A short-lived doctoral school, developed by Trevor Wood-Harper and Mike Metcalfe in the mid-to-late 1990s, defined research directions for about five years. More recently, the curriculum has been completely redeveloped by Andy Koronios and Paul Swatman to reflect more contemporary approaches to IS education.

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Paula Swatman currently has a double role at UniSA. She is the Inaugural DAIS/Fuji Xerox/State Library of S.A. Professor of Business Information Management within the School of Computer & Information Science; in the Division of Information Technology, Engineering & the Environment. In addition to her role in Business Information Management, Paula is also the continuing Professor of Information Systems within the School of CIS. She has significant academic & industry experience, as well as research & teaching interests, in the area of E-Business / E-Commerce and many of the newer extensions of this area (such as M-Commerce and E-Learning). Her specialist interests are in the strategic use of E-Commerce / E-Business; the creation and diffusion of E-Business models; the use and application of standards; the evolution of the digital content sector; E-Markets & supply chain management; rural telecommunications and the impact of M-Commerce on rural Australia; the implications of the World Wide Web and the online economy; and E-Learning and education in the New Economy.



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