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Information Systems Degrees in Australia: the Genesis

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Abstract. This paper traces the birth of the Information Systems degrees offered by RMIT University in Melbourne, Australia. The paper argues that university curriculum in new areas is a reflection of forces both social and individual. The case of Information Systems curriculum is distinctly different from Computer Science both in the extent of these influences and in the nature of the relationships between the University and industry in general. The analysis presented here is a social history. It does not concentrate on pivotal moments of invention so much as the people and influences that culminated in programs that persist until today

Keywords: information systems curriculum, information systems history, information systems

1. Context: Australia, an Early Adopter

The environment in which this study commences is of broad experimentation with computers becoming widespread in both government and industry. A significant dearth of qualified personnel in the computing industry brought experts from all over the world to a vigorously growing Australia. People from this burgeoning area were also recruited into universities at a very early stage.

At the Royal Melbourne Institute of Technology (now RMIT University) Brian O'Donahue (from the Commonwealth Public Service) was recruited to head the Data Processing Group. People like Cliff Forrester, who had become engaged by computers after working on EDSAC (Electronic Delay Storage Automatic Calculator) in England as a result of his aeronautical jobs at Farnborough, drifted from some part time teaching at Caulfield Institute (one of the first Colleges to offer formal degrees in Information Systems) into a full time role at Royal Melbourne Institute of Technology (RMIT).

These industry experienced academics reflected the early entry of the country into computing. Australia has a relatively long history of computing. The CSIR Mk1 (CSIRAC – Council for Scientific and Industrial Research Automatic Computer), built in the late 1940s was Australia's first internally-stored-program computer and is acknowledged to be the world's fourth (Tatnall & Davey, 2004b).

1.1 RMIT University Evolution

RMIT is quite old in Australian terms. The University opened for business on 7th June 1887, as the Working Men's College with an initial enrolment of 600 students. In 1934 the Working Men's College was incorporated and its name change to 'The

Melbourne Technical College' and in 1960 the 'Royal Melbourne Institute of Technology' was adopted as the new name by the council. Over the life of the institution the various names included:

- RMIT University (1992-)
- Royal Melbourne Institute of Technology (1960 – 1991)
- Melbourne Technical College (1934-1959)
- Working Men's College (1887-1933)

Merged institutes and colleges incorporated into RMIT University include:

- Phillip Institute of Technology
- Preston Institute of Technology
- State College of Victoria (including Coburg Teacher's College)
- Emily McPherson College (and College of Domestic Economy)
- Melbourne College of Printing and Graphic Arts
- Melbourne Institute of Textiles

By 1988 The College offered classes in technical, business and arts subjects with an emphasis on applied skills relevant to trades including architectural and mechanical drawing, theoretical and applied mechanics, plumbing, carpentry and painting, as well as studies in arithmetic, algebra, bookkeeping, shorthand and physics.

Currently (2012) there are more than 75,000 enrolled students (with 19,600 Vocational Education and Training students) including 28,000 international students representing more than 100 countries. The heritage of starting as a union supported college for working men has seen the University orientate itself in such a way where curriculum and applied research are heavily influenced by current industrial practice.

The clear industrial orientation and interest in applied rather than pure research provides an interesting beginning and backdrop to the history of the creation of information systems programs. The story of curriculum development presented in this narrative involves academics who were recruited to the University because of their industrial experience rather than their traditional academic experiences such as research publications and grants success.

2. Research Method

The themes that form this paper were derived from text analysis and analysis of interview transcripts. To achieve some validity in the process the three researchers produced independent analyses from a subset of the sources used. These were then compared, and an iterative process of refinement used, to result in the themes presented here, sources included:

- **Documents**: This history was constructed from original documents such as brochures, Faculty of Business handbooks, course guides and internal University documents, Australian State and Federal Government education reports, published policies and papers.
- **Interviews**: Face to face interviews were also conducted with Cliff Forrester, Audra Lukaitis and Stasys (Stas) Lukaitis which were recorded.

Cliff Forrester was employed by the University after leaving Caulfield Institute in 1965 to help teach in the courses set up by Brian O'Donoghue as part of the then accounting degree. Audra Lukaitis and Stasys Lukaitis worked for different parts of the University, and were brought together by the formation of the new Department of Business Information Systems on the centenary of RMIT's opening in 1987 and were founding members of the new Business Information Systems Department. This means that they were able to observe the evolution of existing courses into degree programs in information systems first hand.

3. Australian Government Education Policy

Higher education policy, dictated by the national government, is the first major influence on the environment. The aims and missions of higher education institutions such as RMIT University and the birth of information systems education must be seen in the context of this environment. State and federal government higher education policy has influenced the mission and direction of higher education institutions throughout Australia particularly in the post-World War II era.

How government has responded to population growth, economic boom times and recessions, labour market trends, upswings and downturns, university overcrowding, increasing demand for higher education, the financing of higher education, internationalisation of education provision and other various economic or political imperatives through higher education policy is critical to understanding most higher education institutions in Australia.

Where originally higher education was mostly funded by the state government, changes in funding mechanisms from state to the commonwealth government meant that control shifted away exclusively from state control to national control, from institutional autonomy to national government accountability. As demand for higher education increased, and traditional labour markets disappeared, the higher education system moved from an elite to a 'massified' system (today also about 50% self-funded).

3.1 The Murray Report (1957)

In post-World War II Australia, The Murray Report (1957) prompted far reaching changes to Australian universities "*from largely undergraduate institutions to modern research universities*" (Lindsay, 1987). The Murray report is also significant in that it informed much of the higher education policy and debate for almost the next forty years. In his investigations, Murray found severe overcrowding in universities, initiating expansions in the sector via Commonwealth funding matching state funding.

The key outcomes of the Murray Report included the establishment of the Australian Universities Commission (AUC) in 1958, the Commonwealth Government helped fund universities for recurrent and capital purposes, the funding of scholarships particularly for teacher training was introduced, and Commonwealth funding of postgraduate education and research.

In his report Murray stressed the roles and functions of universities and technical colleges – the technical college is to produce technicians and craftsmen (of which there was an urgent national need), the function of universities is professional training including research, which should promote national interests and is vital to the academic health of staff and students.

In the 1960s the economic, demographic and social expansion started in the 1950s continued. Demand for university places and severe overcrowding, highlighted by Murray almost a decade earlier, increased. According to Meek, "*political and social pressures to further expand higher education intensified*" (1991:465).

3.2 The Martin Report (1964-1965)

The Martin Report recommended the creation of Colleges of Advanced Education (CAEs) rather than the expansion of universities, thus creating a new binary system for higher education. The CAE was "*based on a new kind of institution, more applied and less research-oriented than universities*" (Karmel, 1988:121). Martin reiterated and reaffirmed boundaries between academic and vocational education. Meek (1991:466) notes that despite the recommendation of the Martin Report the binary system transformed itself into a 'trinary' system in just over ten years with colleges of Technical And Further Education (TAFE) taking up apprenticeship training and sub-diploma courses. RMIT's new status as a College of Advanced Education was reflected in a name change to the Royal Melbourne Institute of Technology which it held from 1960-1991.

3.3 The 1970s

In 1974 the Whitlam Labor government initiated further major changes in higher education. Tuition fees were abolished and the generous Tertiary Education Assistance Scheme (TEAS) was introduced. Moreover, all recurrent and capital funding of universities and colleges of advanced education was taken over completely by the commonwealth government from the states. This meant that tertiary education could now be controlled nationally, policies would be set nationally, and funding would be controlled at the national level. According to Harman (1989:4) the federal government had now become the "*dominant partner in policy determination and planning for higher education*"

After the dismissal of the Whitlam Government after denial of 'supply', Prime Minister, Malcolm Fraser's so called 'razor gang' tried to respond to increasing political and public pressure for funding constraints across the board nationally in the context of a global recession, industry shut downs and massive redundancies in the workforce across Australia. A climate of accountability and cost cutting prevailed, as the new agenda of restraint in government spending set in, particularly in education, the modus operandi became how patterns of post-secondary education satisfactorily matched labour markets.

3.4 The 1980s

The Malcolm Fraser Liberal government specified amalgamation rounds of targeted colleges of advanced education (CAEs) linking these to federal funding. One third of CAEs were told to amalgamate, and by 1983 all but four of the CAEs had amalgamated. In such a climate of economic restraint issues of quality and efficiency moved to the top of the higher education agenda. How could more be done with less?

By the 1980s continuing changes in the global economy and other factors – for example the Bob Hawke/Paul Keating Labor government 'level playing field' policy of reducing tariffs, particularly in manufacturing and textile industries – saw a decline in Australia's manufacturing base and an erosion of traditional overseas markets, increasing global competition, resulting in the decline or disappearance of many skilled and unskilled jobs and industries, while other traditional skills were changing with the rise of technology in the workplace. Under this government, state sector industries were dismantled, the financial system deregulated and the Commonwealth Bank of Australia sold off.

In higher education, further major rationalisations were carried out through amalgamations. There was a rapid growth in advanced education and by the mid-1980s CAE students outnumbered university students. Until the late 1980s the commonwealth continued to provide 90% of higher education funding.

By the early 1980s Australia was again in recession, and by the end of the term of the Fraser government, unemployment topped 10%. With government cutbacks in higher education funding, CAEs and universities began to seek ways to raise revenue and make up government funding shortfalls through full-fee short courses, international student revenue and initiating partnerships running off-shore accredited education programs. CAE academics in particular were encouraged to become involved in consultancy work and full-fee overseas students were enrolled in greater numbers across campuses in Australia. As demand for tertiary education continued following on from increasing school retention rates, Australia mirrored other comparable OECD countries in the provision of tertiary education from an elite to mass system (the next transition being a 'universal' provision).

3.5 Dawkin's Green Paper 1987

In late 1987-1988 further influential and far reaching changes to higher education were proposed and ratified by Dawkins in the so called '*Green Paper* 'of 1987 (Higher Education: a policy discussion paper) and ratified by the '*White Paper*' of 1988 (Higher Education: a policy statement). The report noted that industry had increased its demand for postgraduates in the areas of management, business and commerce, proposing that education and training would play a *central role* in responding to Australia's major economic challenges. Dawkins abolished the Commonwealth Tertiary Education Commission introduced by the Fraser government and formed the National Board for Employment, Education and Training.

Perhaps the most dramatic of Dawkins' reforms (under the Hawke/Keating Labor government) concerned the further amalgamations of many universities and CAEs throughout Australia, effected through funding allocations based on institutional

profiles and students numbers, giving rise to large multi-campus universities and CAE institutions across Australia, via the so-called 'Unified National System'. The distinction between colleges of advanced education and universities was removed, in effect granting former colleges of advanced education university status. The catch cry of Hawke/Keating government was that they were setting up conditions to foster a 'clever country'. In effect this led to today's 'corporatisation' of universities.

Dawkins further introduced the Higher Education Contribution Scheme (HECS). Through this scheme students paid university fees via the Australian tax system, either upfront receiving a discount or later through deductions from their wages. There was a fixed charge for various programs with arts and humanities at the cheaper range of the spectrum, computer science and information technology in the middle spectrum, and medicine, dentistry and law at the most expensive end.

With a change in government, Amanda Vanstone (under the Howard liberal coalition government) increased HECS charges to students, and reduced grants to universities.

Simon Marginson (2001) in analysing trends in the funding of Australian Higher Education and concludes:

> *"The Dawkins reforms remade higher education as a competitive system of self-managing institutions with control over their own resources, while subject to accountability requirements and limits on numbers in relation to government-funded places. The underlying objectives of the shift to mixed funding were to provide fiscal relief for the government, and to strengthen economic relationships between universities and industry so that higher education would contribute to national competitiveness. The first objective was successfully achieved. The HECS was introduced in 1989 at an average 20 per cent of course costs; later, in several stages, the level and rate of repayment were increased. The DETYA data also record a rapid increase in incomes from international student fees, vocational postgraduate fees, especially in Business Studies, and continuing education ... The number of international students grew from 21,112 in 1989 to 83,111 in 1999 ....*
>
> *By 1998, 33.2 per cent of all income received by higher education institutions was derived from the HECS plus university-determined fees and charges, compared to about 2 per cent derived from fees and charges in 1983. In 1998 income from international students constituted 8.3 per cent of all income, and more than one dollar in five in institutions with greatest exposure to the market. Whereas governments provided 90 per cent of funding in 1983 and 70.3 per cent in 1989, by 1998 the public share was down to 51.9 per cent ... Though most OECD countries saw increases in private funding during this period (Williams 1992), the Australian change was remarkable in its speed and universality."*

These influences are critical in understanding the development and growth of RMIT University and the school as it is today. Autonomy, direction, funding and control have shifted from the school to the university as the university now relies heavily on international tuition fees, general tuition fees and other fund raising

activities in order to operate in the face of diminishing government fiscal support and heavy reporting and assurance activities.

4. Computing Before the Inception of Information Systems

The history of computing at RMIT commences in 1962 with the lease of an Elliot 803 computer (Tatnall, 2006). In 1986 the Faculty of Business (subsequently the Business Portfolio and now College of Business) was composed of the Department of Accountancy, the Department of Administrative Studies and the Department of Applied Economics.

Noel Anthony was appointed Foundation Dean of the Faculty of Business in 1977 and encouraged the Faculty of Business Computing group to acquire and deploy a new HP250 minicomputer, funding the setup of the first terminal labs in the Business Faculty. Noel Anthony retired in 1986, with the new Dean Dr. J. Milton-Smith appointed 1986, commencing in 1987.

In the first instance the Department of Accountancy employed some people from industry to deal with the problem of students, particularly rising numbers of postgraduate students, wanting to be able to design, manage, oversight, implement or participate in the introduction of data processing equipment and systems into their organisations.

Eventually there were enough people to create a data processing group and for a leader of that group to be employed. The first leader was Cliff Forrester who became so disenchanted with organisational administrative tasks that he applied for leave to undertake a Masters in Computing at the University of Texas. His replacement, Brian O'Donaghue, took the data processing group, now considerably enlarged because of the demand for courses, into the newly created Department of Administrative Studies.

The group provided significant service teaching throughout the Faculty of Business as well as offering streams into some degrees. Eventually the Department of Administrative Studies offered graduate diploma degrees, starting first with computing programing: the Graduate Diploma in Commercial Data Processing. This timeline compares with the creation of the RMIT Department of Computer Science in 1981 (Tatnall, 2006). In 1984 the information systems group was created in the Department of Administrative Studies under the leadership of Tony Adams (replacing George Sutherland), co-opted from the Department of Computer Science. By the end of 1984 the data processing group consisted of Tony Adams (Principal Lecturer), Neville Stern and Nigel Thomas (Senior Lecturers), and lecturers Cliff Forrester, Hugh Ballantyne, Philip Crutch and Stasys Lukaitis (Tatnall, 2006).

5. 1988 – The Department is Created

In 1988 the Faculty of Business under Noel Anthony saw the demand for information systems courses to be too large (with demand growing) for a group within the Administrative Studies department. The Department of Business Information Systems was created under the leadership of Tony Adams. Tony had previously worked in the

Department of Computer Science at RMIT, and before that had come from industry where he was the Data Processing Manager for Monash University in Melbourne.

It was also in 1988 that Stas Lukaitis was tasked with the replacement of the HP250 minicomputer and a new technology DISC symmetric multiprocessor UNIX minicomputer was acquired.

The first Windows Personal Computers were being deployed along with early Apple Macintosh computers.

5.1 1988 – Secretarial Studies Fights Back

By the mid-1970s and 1980s Australian university places were created and mostly funded by the federal government. This funding arrangement was especially important for the formation of undergraduate degrees at that time. A new degree could only be created by taking student places away from other programs (or courses as they were called then).

RMIT had very successfully run secretarial business studies degrees and graduate diplomas in the 1960s and 1970s and had an outstanding reputation in this area. The first secretarial business studies degree was launched in 1976, and 1979 saw the first students graduate in the three year Bachelor of Business in Secretarial Studies course where students studied sociology or psychology, general accounting, macro-economics, commercial law – contracts, company law, principles of finance, marketing, data processing, labour relations in addition to secretarial studies and supervised professional practice.

According to the secretarial studies group, these graduates readily found employment in secretarial/administrative positions and many had multiple job offers. The secretarial undergraduate degree brochure recognised that technological change in the office was a challenge to management to understand and seek out the advantages of technology for their organisations and personnel; they were challenged as to whether they would "*let it happen*" or "*make it happen*" emphasising that RMIT is producing people "*to make it happen*".

In the late 1970s the University hierarchy attempted to close down the secretarial studies degrees, wanting to release the funding for other purposes. RMIT had underestimated the 'fight back' response of the secretarial studies group who galvanised a large number of alumni, many of whom worked for powerful people in powerful places, including leading business leaders, politicians, and members of Parliament. There was a large 'penultimate' city protest/demonstration with news coverage.

The secretarial group consisted mostly of a small number of older (not too far off from retirement) women who had given good service to the Tech (as RMIT was fondly referred to), students and the community. Their educational standards were rigorous and their group was run along 'traditional' lines, from another era. The women were well educated and had various backgrounds including experience in industry. There was a strong hierarchy, a very strong commitment to 'standards' from which the group did not swerve; there were many students who would never graduate as they could not meet specified required minimum skill standards (which were actually quite 'high' by today's standards). In their way they kept up with technology

(for example they had championed and overseen the installation of memory typewriters, then a dedicated word processing laboratory stocked with a small number of IBM dedicated word processors and a laboratory of dictaphone machines and electric typewriters, however, were finally stumped by the introduction of the personal computer (PC) and the new software. The Tech had to 'back down' from the total shutdown of the secretarial group, reviewing their position regarding redundancies.

5.2 The impact of the PC on secretarial studies

There was much happening during the 1980s in respect of the impact of personal computers and changes to work processes. Fine old business traditions such as typing pools, comptometrists and ledger machine operators were being slowly replaced with electric typewriters, memory typewriters, word processing centres, dedicated word processing machines then the ubiquitous personal computers with their cheap and user-friendly word processors; calculators had arrived and instead of ledger cards we saw the arrival of departmental computing and database systems.

The secretarial staff mostly had accounting qualifications, two staff members had extensive industry experience but no university qualifications. One particular staff member, Eileen Gueho, was also very active in the Australian Institute of Management, and other business organisations. She also had a large network of important industry contacts that were beneficial to courses, subjects, staff, students and the RMIT all round.

Eileen Gueho was also a cooperative education pioneer, the pathfinder who sourced, negotiated, coordinated and supervised industry job placements for students' cooperative education year (one year of work in industry) drawing on her vast network of contacts and alumni to place students in jobs. She was also a champion public speaker winning competitions in national toastmaster events; she had originally trained as a concert pianist and had worked in industry.

Needless to say, in the context of a seeming upheaval in how office tasks were now being accomplished in industry, particularly the larger global institutions and the rapid changes in technology and the encroachment of personal computers, there were some tensions between the traditionalists and the change agents who could see what was happening in industry.

5.3 New Bachelor of Business – Office Systems/Business Information Systems Streams

With RMIT's re-evaluation of its position due to publicity and unexpected fight back response, the old secretarial undergraduate degree was incorporated into a new hybrid Bachelor of Business degree offering two streams: the Bachelor of Business (Information Systems) and (Office Systems).

Therefore the new Department was built on the secretarial studies government funding. The funding was split 50/50 between two streams: Office Systems and Business Information Systems (each stream consisting of 8 full semester units). It is

important to remember that running an undergraduate degree was determined by the Government funding allocated to the University and divided amongst the competing Departments. These changes were championed by Tony Adams, who lead the dramatic changes and instigated the new undergraduate business information systems degree, incorporating the secretarial group into the office systems streams. Much of the curriculum and course philosophy of the office systems stream was founded on the research and writings of Rudi Hirsccheim and Enid Mumford, and from the beginning were founded on a human factors perspective.

In the office systems program, explanations of the trend towards automating office functions and the need to educate personnel to meet the demands of this evolving business *function* to "*analyse office activities, plan for and design appropriate office systems, implement new office technologies; evaluate and manage the new office systems*" was made explicit. However, to differentiate themselves from information systems the program emphasised the human side of the office "*remembering that all offices depend on people, how they work and interact and people cannot yet be automated. Thus the education of office employees for all levels is viewed with technology, communication and management all given equal focus in the curriculum.*" (Department of Business Computing postgraduate programs brochure 1995:8)

5.4 New Department Built on Large Compulsory Core Subject Enrolment

Equally important, the school was also built on the large compulsory enrolment of all Faculty of Business students into the business computing foundation subject 'Computer Applications in Business'. At that time over 1,300 students were enrolled in this subject. The whole Department taught into this subject, including the Head and the Principal Lecturer both on campus and overseas, and every staff member contributed content, direction and teaching, including lectures and laboratory sessions. Curriculum included word processing, spreadsheets, database, expert systems and was for a time 'bilingual' – teaching software on Microsoft Windows PCs and Apple Macintosh computers. A series of supporting lectures expounded on the latest developments in information systems and technology, raising issues about security and ethics from the very beginning. In fact, Tony Adams, the founding Head of Department, pioneered the Australian Computer Abuse Research Bureau (ACARB), which was visionary for its time. It was also at this time that the Faculty of Business started to experience a leap in enrolments. Demand was burgeoning across all business programs and courses.

5.5 A fresh paradigm of working with new technology in business

This introductory computing subject was always considered with some importance to the Department, as it was the cornerstone and portal to other information systems and business computing subjects offered, also it was an important source of university funding. It was a core subject of all Faculty of Business degrees. Incidentally the content and style of the subject was built on industry consultancies delivered by

RMIT's Australian Microcomputers Industry Clearing House (AMIC) – a consulting arm of the University staffed by department academics (who also were required to consult in industry) and other computer specialists. It was through this organisational group that RMIT and the Department were able to generate income to fund resources, software and equipment.

The basis of this subject was that it addressed the impact of the (then) new technology Personal Computer and its associated personal productivity software and how working in business would change forever. The term 'paperless office' was also coined about that time.

Although generally the software and other concepts have changed with natural developments and in computing in business, the framework is essentially the same as it was 25 years ago. Like the London underground map, the introductory computing subject map put together by the data processing and office systems groups has stood the test of time.

One of the reasons for its success is its elegance and simplicity addressing the way people would think and work with this new technology in a business context.

5.6 1988 – The first Bachelor of Business (Business Information Systems) Degree and Growth in Postgraduate Diploma Enrolments

By 1988 the new Bachelor of Business (Business Information Systems) consisted of two major streams: Business Information Systems and Office Systems. The new program extended over four years (of which there was a one year work placement component). The office systems stream looked at the human factors in and around the implementation of information systems, whereas the business information systems specialised in the technical design and implementation of information systems.

Each stream also offered a one year full-time, or two-year part-time, graduate diploma (a postgraduate qualification) consisting of eight subjects. The jobs the Office Systems postgraduate course targeted for their graduates were Systems Training Officer, Market Planning Manager, Information Manager, Personnel Officer, Projects Coordinator, Change Management Consultant, Office Technology Consultant, Database Systems Officer, International Marketing Specialist and such like. Business Information Systems targeted jobs such as Systems Analyst, Database Programmer/Analyst/Administrator and information technology consultant and advisor.

The Postgraduate Diploma in Secretarial Studies continued (with large numbers of students still applying), though the program was to be rebadged and restructured as the Graduate Diploma in Business Systems reflecting its predominantly business curriculum of accounting, marketing, law and management..

The Postgraduate Diploma in Commercial Data Processing also still continued (with large numbers of students applying and growing).

5.7 Close ties with industry

The Department and its academic staff had arisen from demands of industry for job specific training. This was (and is) reflected in working conditions and priorities. Until recently PhD qualifications were seen as irrelevant as the role of the College of Advanced Education (CAE) was "*more applied and less research-oriented than universities*" (Karmel, 1988:121). The Martin Report tabled in 1964-65 recommended the creation of Colleges of Advanced Education rather than the expansion of universities to cope with the demand for more universities places. The mission of the college of advanced education was therefore very different from that of a university.

Rather than research, RMIT CAE academics were required to teach and consult into industry and maintain close links with industry. In her interview Audra Lukaitis describes this priority:

> *"It was a very heavy load to work in industry as a consultant and then work full-time as an academic. Nevertheless this experience was to prove absolutely invaluable to me and has informed my whole approach to computing education. To industry I was able to bring fresh ideas, concepts and theories garnered from research in my fields, and from industry I was able to bring back real world case studies that informed all assignments, approaches and curriculum content. I was able to see firsthand what really went on in industry as a participant and bring it back to the classroom, enlivening the student educational experience."*

In an interview, Stasys Lukaitis remarks:

> *"It might be of interest to note that AMIC – Australian Microcomputer Industry Clearinghouse - was created by an enterprising Tony Adams and others in response to the 'sudden' arrival of microcomputers onto the scene, much like the recent 'cloud and mobile computing' phenomena. The demand for short courses and consultancies on the use and deployment of micros, their software e.g. – Visicalc, Lotus, MultiMate, WordStar, Dbase was huge and AMIC blossomed. Several BIS staff were recruited from the ranks of the industry experienced consultants who worked at AMIC (e.g. Peter Viola who was a Manager at AMIC for many years).*
>
> *Academics who worked at AMIC were actually paid at standard industry consulting rates. It was this that created issues with the Chancellery who were concerned that academics were being paid too much. That was the start of the demise of AMIC, the birth of the MDC[1] and the end of academic input into University industry education engagement."*

Thus in the past under the leadership of Tony Adams and Eileen Gueho and the academic staff at the time there was considerable engagement with industry almost on a day-to-day basis. There was a prevailing atmosphere of excitement and anticipation.

[1] MDC: The Management Development Centre – the University's official window to business and industrial education. The MDC was more structured and bureaucratised and the role and influence of academics somewhat reduced.

5.8 Overseas Demand

Right from the formation of the Department of Business Information Systems (now School of Business Information Technology and Logistics) the founding Head, Tony Adams along with others in the Faculty began to pioneer and establish international education initiatives onshore and offshore, namely in Malaysia, Singapore and Hong Kong; particularly with Barry Cooper from Accountancy and James Hurley from Administrative Studies who set up the original Malaysian offshore business degree at Taylors College. Hugh Ballantyne was also instrumental in promoting the Department's courses overseas at education fairs and such like.

In retrospect it can be seen that this was partly a response to changes in government higher education policy and early decline in government funding, and in parallel the new demands for 'research' and computer equipment which had to be funded.

Staff were now required to teach overseas (in addition to consulting in industry), which certainly added another challenge, but without a doubt yet another valuable dimension. Groups of students from around the world appeared in classrooms in increasingly large numbers. This brought many new challenges for which many staff were unprepared - academic standards, assumptions, English language proficiency, writing and comprehension, extremes in diversity, cultural differences - all had to be dealt with. The international student market was grown very aggressively and successfully by Barry Cooper from Accountancy, Colin Bent from Economics and Finance and Tony Adams from Business Information Systems (onshore enrolments and offshore partnerships). They were initially the ones who had the vision to expand RMIT's activities globally; they were the pathfinders, the global thinkers and doers. Once again, teaching overseas was considered to be 'above load', so academics were paid separately for overseas teaching while still putting in full time work back home, nevertheless all academics were required to teach overseas.

In hindsight it is clear why RMIT Business, and Business IT in particular, were so successful in recruiting overseas students and in expanding offshore education. The answer lies in the type and quality of the academic staff who engaged with the students. Staff almost entirely deeply understood and were experienced in industry and business and enthusiastically transferred that quintessentially Australian educational experience to the overseas students. As one student remarked in a survey at the time "*the most interesting thing about this course is listening to the war stories and experiences from the real world*".

5.9 Heads of School – The Champions

It is useful to view the evolution of the School of Business Information Technology in terms of the Heads of Schools who have contributed so much to its continued success and continuing relevance in terms of the context of the times and developments in communication and information systems technologies, also in the context of evolving national government higher education policies and RMIT University's response to changing times.

Table 1: RMIT Department of Business Information Systems Timeline

Period	Head	Events
1984-1990	Tony Adams	Information Systems Group formed inside the Department of Administrative Studies, amalgamated with Secretarial Studies and eventually becomes an Independent Department of Business Computing. The PC and Macintosh become ubiquitous, local area networking starts becoming popular and desktop software becomes accessible and user friendly. AMIC and external consulting extensive. Staff appointments from experienced industry sources. Global education initiatives. Ever increasing demand for business information systems education, particularly at the postgraduate level.
1990-1993	Neville Stern	Adams becomes Acting Dean of Business, while Stern becomes acting head. Turmoil in Australian academia as Universities forced to amalgamate by government as cost cutting measure. RMIT's proposed amalgamation with Victoria University aborted, Philip Institute (PIT) amalgamation alternative proposed. The Internet is born. More industry sourced staff appointments. AMIC ceases and the MDC is born, industry consulting at its peak. Student demand continues.
1993-2001	Ken Millar	PIT amalgamation proceeds and PIT's Ken Millar becomes Head of Department. Department moves from LaTrobe Street campus into central business district. Amalgamation with Department of Information Management and Library Studies. Forced amalgamation with VET (Vocational Education and Training) sector computing group. Staff appointments now from both industry as well as career academics (research and publications experience alone). MDC demise, industry consulting diminishes and is eventually discouraged in favour of research and publications. Various attempts to create a Faculty of Information Technology amalgamating Computer Science and Information Systems, fail. BIS Department creates business oriented networking subjects.
2001-2002	Tom Yardley	Yardley appointed as acting Head upon Millar's retirement. Ongoing failed attempts to create a Faculty of Information Technology.
2002-2003	Kevin Adams	Adams appointed as acting Head from Department of Accountancy. Staff appointments are now only academic with no further industry experience considered appropriate. The demise of the postgraduate programs Information Systems and Office Systems, all postgraduate programs amalgamated into the Master of Business Information Technology. Prerequisite of prior industry experience dropped.
2003-2005	Carolyn Dowling	Career academic Dowling appointed from Australian Catholic University as Head. Subsequent staff appointments now only career academics. VET sector amalgamation abandoned. University policy phases out postgraduate diplomas (8 courses) and slims down 16 course Master degrees to 12 courses. All graduate diplomas in the school amalgamated into the one Masters of Business Information Technology.
2005-2005	Barry McIntyre	McIntyre from the original Information Management and Library Studies Department appointed acting head.

Period	Head	Events
2006-2010	Brian Corbitt	Career academic Corbitt variously from Thailand, University of Melbourne and Deakin University appointed as Head of the now School of Business Information Technology. All new staff appointments now young career academics with little or no industry experience. Research, publications and grants are now top priority. Corbitt instrumental in developing a stronger research and innovation culture. All staff encouraged to do more research and publish in academic journals and attend conferences or undertake or finish off higher degrees. Faculty of Business renamed as College of Business.
2010-2012	Caroline Chan	Chan from Deakin appointed as Head of the now renamed and re-tasked School of Business IT and Logistics. Logistics group of a dozen career academics absorbed into the School. Centralised administrative and strategic functions strip course and program development and strategic industry direction out of the School into College Office. No Information Systems representation left at the strategic college level.

6. Conclusion

This paper has presented the creation of Information Systems programs form the viewpoint of the significant forces that shaped events.

The demise of secretarial studies and the degree programs that emerged with the creation of the information systems department seem illogical. Managers continue to have executive assistants and support staff who in addition to a sound business education in accountancy, economics and finance, marketing, business law, human resources and management need to have particular additional skills in using technology and an understanding of information systems. The argument used against programs for these types of people seems to have been based upon a belief that secretarial studies consisted of training in technology that had been completely replaced by the computer. This argument concentrates on the replacement of the typewriter and shorthand with the word processor and dictaphones.

Another outcome may be reflected in the nature of information systems curriculum. At RMIT Information Technology based courses took two paths right from the beginning. Computer science was developed from the machine, its design, and programs that could run on it. Computer Science was based in the disciplines of mathematics and applied physics and electronics and, as such, could be seen as a valid integration of those two areas. The Computer Science Department arose from the Department of Mathematics and Computer Science, originally just Mathematics. It is of interest that most Computer Science people originated from the maths and science disciplines where it was based. Much of the curriculum was scientific and mathematical with scant regard paid to business and ‘commercial data processing’. Computer Science degrees in the 1970s studied compiler design, the solutions of differential equations, operations research, calculus, artificial intelligence and a form of software engineering. This, of course, was to be expected given that the academic staff of Computer Science was either scientists or mathematicians.

On the other hand Information Systems and Office Systems arose from the demand of industry to provide education and training for staff required to understand and implement new technologies in business. In the late 1960s and early 1970s there was a plethora of courses aimed at producing workers in business capable of playing a part in the data processing of the business. The early programs offered by the data processing group and by the Information Systems Department were heavily skewed towards postgraduate education. Vast numbers of students enrolled in postgraduate programs part-time so as to gain the business-oriented computing skills and education needed in their new jobs.

It is also of interest that it was the office systems group that introduced a human factors perspective in the design, implementation and management of information systems education at RMIT. In hindsight, the basis for this is quite obvious – it was in fact the office systems group who had the most extensive business contacts and experience with professional engagement.

It is no coincidence that the Accounting Department was an early sponsor of these courses and the creation of the data processing group. The Accounting Department would be the first to understand the changes happening in business due to the introduction of computers in business data processing.

When the first head of the Information Systems Group, Tony Adams came from Computer Science he may have been tempted to import some computer science flavour into the courses. His recruitment record clearly indicated that he understood the difference between computer science and information systems. He hired senior people from IBM, HP and other businesses who would understand the needs of the graduates of these courses. This meant that the courses developed by the Information Systems Group were heavily biased towards current business practice in industry. The programming languages were Cobol and forms of business oriented Basic rather than FORTRAN, C and Pascal. Systems subjects were prominent in many subject names and used the words data processing.

The use of business-oriented databases was pre-eminent and was the foundation of much curricula. A key difference between the Computer Science view of databases and that of Information Systems was that IS was concerned with modelling the business and its processes rather than the calculus and mathematical aspects of the database.

With the foundation of the business information systems degree incorporating office systems curricula a stronger ‘human factors’ and sociotechnical systems design dimension was added to business computing studies in and around human computer interactions, end-user systems, useability and accessibility of human systems, the impact of computerisation on work processes, management and change management.

Data communications was taught from the business perspective of connectivity and ubiquitous data access rather than queuing theory and sliding window protocols.

Today’s Information Systems is the result of blending the best from the modernised Office Systems program which was concerned about how a business operates effectively and from the old data processing that was concerned with the modern business and the technology-enablement of its processes and operations. This outcome is the result of a 25 year old vision of Tony Adams who foresaw the importance of academia and industry working together with new technologies to solve tomorrow’s business problems. Tony Adams also had the experience and vision to

understand the impact of computing on work processes and that the 'human factor' was of vital consideration in the design and implementation of computer systems in business. Both Tony Adams and Eileen Gueho understood the importance of industry engagement very early on, seeing a vital link between theory and practice, industry engagement is today RMIT's enduring brand.

Their vision was able to be brought into being because the University at that time encouraged leadership, innovation and creativity to flourish at a local level. Adams and Gueho recruited and employed talented individuals with extensive industry understanding and experience. Individuals who had deep links with industry and who nurtured and grew them. The Dean at that time was Noel Anthony who trusted his staff with the responsibility of keeping RMIT abreast and indeed ahead of those heady days.

This paper recounts the history of a single university's information systems degrees. It would be interesting to look at the history of other information systems programs to see if similar backgrounds have produced an environment similar to that of the current information systems programs at RMIT.

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