

e-Everything: e-Commerce, e-Government, e-Household, e-Democracy

14th Bled Electronic Commerce Conference

Bled, Slovenia, June 25 - 26, 2001

eBusiness and Information Systems: Academic Programs in Australia and New Zealand in the e-Age

Elsie S.K. Chan

School of Management Information Systems, Faculty of Business and Law
Deakin University, 221 Burwood Highway, Burwood, Australia 3125
Elsie.Chan@deakin.edu.au

Paula M.C. Swatman

Institute for Management, University of Koblenz-Landau
Rheinau 1, 56075 Koblenz, Germany
Paula.Swatman@uni-koblenz.de

Abstract

Universities are increasingly turning to 'fashionable' education programs to attract bright, high-quality students to both under-graduate and post-graduate degree programs. Traditional offerings in technology areas, such as Information Systems and Information Technology are being augmented by newer, more marketable degrees in areas such as eCommerce/eBusiness. This paper analyses the eCommerce/eBusiness and Information Systems (IS) / Information Technology (IT) academic programs in Australian and New Zealand universities on the basis of Kotler and Fox's service offering model of educational institutions; and considers what differences exist between these two apparently similar areas of academic endeavour. Finally we look at the trends of academic program delivery in the e-age and question whether universities need to take a more consumer-product approach to the issue of attracting appropriate students.

1. Introduction

Internet technology has provided a new level of cost-effectiveness to the earlier, proprietary network-based eCommerce systems and is increasingly infiltrating all areas of business and domestic activity. Governments promote eCommerce activities – for example, Western Australia Office of Information and

Communications (1998) and New Zealand Ministry of Economic Development (2000). To cope with the need for trained specialists in the e-age, universities have started to offer eCommerce/eBusiness academic programs over the past few years. These programs are relatively 'new' in Australian and New Zealand tertiary institutions:

- In Australia, Curtin University broke the ice in 1997 with its eCommerce offerings, followed by Monash and Deakin Universities in the later 1990s.
- In New Zealand, the University of Waikato was the first university to offer a Bachelor of Electronic Commerce in 2000.

Further evidence of the increasing acceptance of these courses can be seen from the fact that discussions concerning methods of teaching Electronic Commerce at universities are beginning to appear in well-regarded conference proceedings and journals (see, for example, Hampe 1998; McCubbrey 1999; Davis *et al.* 1999; Dhamija *et al.* 1999; Parker and Swatman 1999; Joyce 2000; Ge and Sun 2000; Hecht 2000 and Swatman and Chan 2001).

An interesting contrast to this newly emerging area of academic education is the field of Information Systems (IS), which covers a wide range of subjects and has, at first sight, a fair degree of similarity with eCommerce/eBusiness. Tertiary education in computing in Australia originated in the 'Institute of Technology' sector and only moved into the more "traditional" universities following the major changes to the Australian university system initiated by Labour's Minister for Education John Dawkins in 1987, which led to the 'traditional' universities beginning to offer IS degrees and post-graduate qualifications. The original term EDP became first Business Computing and, later, Information Systems (IS). The IS curriculum area has grown over the past twenty-five years to a considerable size and level of importance in tertiary education (Tatnall 1993).

The Information Systems curriculum has been discussed over quite a long period of time, as one would expect from this much older disciplines (see, for example, Buckingham 1987; Lo 1989; Fielden 1990; Ang and Lo 1991; Ang 1992; Avison 1993; ACM, AIS and AITP 1997; Clarke 1999; Tatnall 1999). Material is also available concerning the teaching of IS subjects (see Lawrence 1991; Lo and McNutt 1991; Davies and Deshpande 1995; Silver *et al.* 1995; Westfall 1997; Borchers 1998; Mills-Jones 1999; Boggs 2000 and Bryant 2000). Fink and Shafran (1993) investigated the perceptions of final year IS students regarding key IS issues and Clarke (1996) presented some key issues relating to IS courses. The inaugural Australian Information Systems Curriculum Working Conference was held in September 1996 (Arnott, Dampney and Scollary 1996) and a second one was held at Macquarie University in September 1999.

While undertaking a survey of eCommerce/eBusiness degree courses in the Asia-Pacific region, we found that those universities offering eCommerce/eBusiness courses are very likely to be already offering programs/courses in Information Systems / Technology or Management Information Systems (MIS). We began to wonder just what the similarities and differences were. Since many data necessary for such an investigation were available – either from our own survey results, or

from other reputable sources – we decided to initiate a comparison of these two programs. In this paper, therefore, we examine the similarities and differences between the eCommerce/eBusiness and IS/IT programs, using Kotler and Fox's 1995 'service offering' model¹ for education institutions.

2. Methodology

We used a survey of web pages to obtain the data (for a more detailed exposition of web-based survey techniques, refer to Comley 1996; Smith 1997; MacElroy 1999 and Grover 2000). Based on the list provided by the Australian Vice-Chancellor's Committee (AVCC 2001), we identified 25 out of 38 Australian universities (65.8%) offering eCommerce/eBusiness programs at the time the data were collected. These programs include bachelors and masters degrees, graduate certificates, and graduate and post-graduate diplomas (Chan and Swatman 2000a). Concurrently, we used the list provided by the New Zealand Vice-Chancellors' Committee (NZVCC 2001) to identify 3 out of 8 New Zealand universities (37.5%) offering programs which were related to eCommerce/eBusiness.

We commenced with the database we had compiled on universities in Australia and New Zealand which were already offering eCommerce/eBusiness bachelors and masters programs, graduate certificates and graduate/post-graduate diplomas (by course work); and compared this with the data from *The Good Universities Guide* (Ashenden and Milligan 2000; 2000a), which provided a list of Australian universities offering IS and IT degree programs. We then compiled a list of those universities offering an eCommerce/eBusiness program as well as an IS or IT degree program(s) (refer to Appendix 1). We then verified this list by comparing these data with the universities' own web pages and that maintained by the Secretary of the Australian Council of Professors and Heads of Department of Information Systems (ACPHIS), which lists universities offering IS teaching (Keen 2001), as well as by emailing individual Heads of Department/Heads of School where data were unclear or apparently contradictory. This system of crosschecks has provided the greatest level of certainty reasonably achievable in an area as fast-moving as this.

In this project, we look at the intersection set of 'universities offering eCommerce and eBusiness' and 'universities offering IS and IT programs'.

¹ We chose this model because it is a 'precise' but 'rich-in-content' model of services which can be provided by educational institutions. It treats the offering of an academic program to students as both a product and service and appears to be unique in so doing.

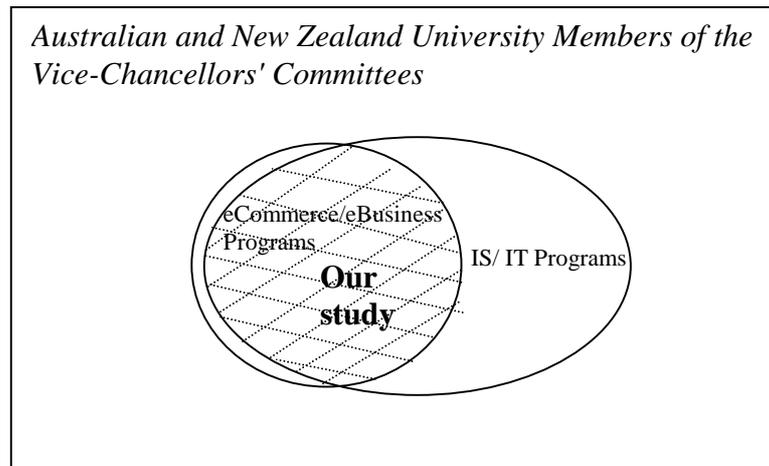


Figure 1: The survey target group

Terminology

Before we discuss the findings of this survey further, we need to look at the ways in which people view the terms eCommerce / eBusiness and IS / IT.

Mesenbourg (1999) defines the terms eCommerce/eBusiness as follows:

Electronic commerce is any transaction completed over a computer-mediated network that involves the transfer of ownership or rights to use goods or services.

Electronic business is any process that a business organization (for-profit, governmental, or non-profit entity) conducts over a computer-mediated network.

Alter et al. (2001) provide a list of definitions and views of e-Business 1999–2001 and Nickerson (2000) sent an email message to ISWorld listserver, asking which name people felt was more inclusive for a university department -- IS or IT -- and received 55 responses, which can be categorised into 3 groups:

1. Information Systems includes Information Technology - total responses: 24 (43.6%)
2. Information Technology includes Information Systems - total responses: 11 (20.0%)
3. Other Comments - total responses: 20 (36.4%)

Since it is not easy to distinguish the literal meanings of eCommerce and eBusiness, nor of the terms IS and IT, we have combined eCommerce and eBusiness into a single category; and have created a second combined category of IS and IT. Different universities have their own interpretations of terms for their academic programs and so, in order to avoid confusion, we define these terms as follows:-

- Teaching unit – this refers to a faculty, school or department within a university.
- Academic program – bachelors or masters degree, graduate/post-graduate diploma and graduate certificate by coursework.
- Subject – an object which cannot be further broken down and which forms the basis of study for the academic program (this applies particularly to unit-based curricula – which are the norm in the English-speaking world). This term is similar to the terms ‘units’, ‘courses’ (commonly found in the United States) and the New Zealand term ‘papers’.

An example to illustrate our terms:

The Department of Commerce is a *teaching unit* at the University of Excellence, which offers BC123 Systems Analysis and Design as a *subject* in the *academic program* of Bachelor of Information Systems.

Research Questions

Swatman and Chan (2001a) provide an analysis of an academic program viewed as a service product, pointing out that many of the universities currently developing eCommerce/eBusiness programs are using such an approach, rather than the more conventional pedagogic process for new degree development. Kotler and Fox (1995) also frequently refer to educational offerings as programs and services. Offering services involves special challenges because most services are intangible, inseparable, variable and perishable. In this paper, we analyse such a service on three levels -- the core, tangible, and augmented levels.

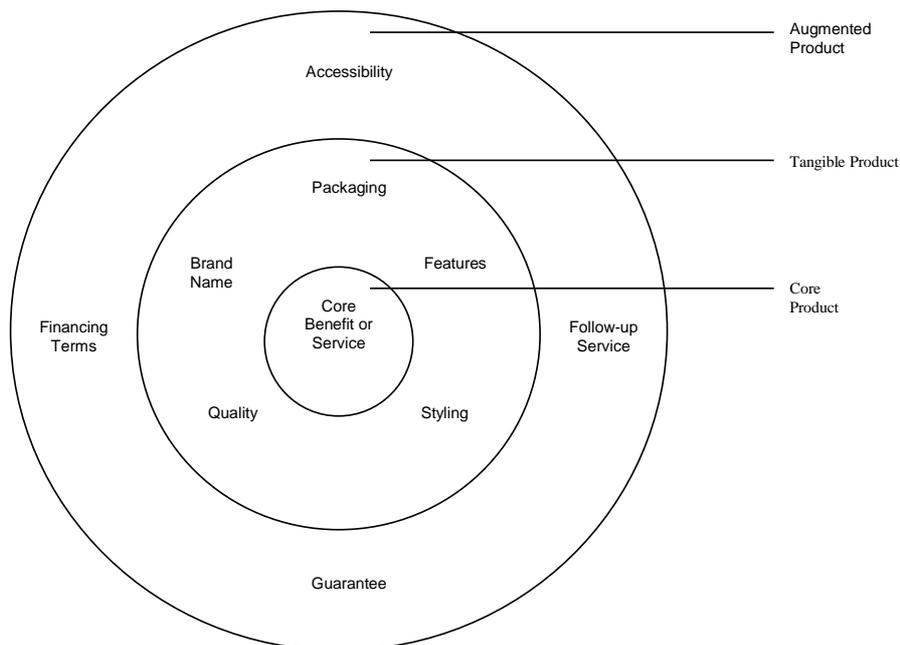


Figure 2: *The three levels of an offer (Kotler and Fox 1995: 279)*

At the most fundamental level of Figure 2 stands the core offer. What is the consumer really seeking? What is the need for the program and can the service really meet customers' needs or wants? This view provides our Research Question 1:

What are the 'core' benefits or services of the core products eCommerce/eBusiness and IS/IT academic programs?

The middle level, tangible offer illustrated in Figure 2 can be described as having 4 characteristics: (i) features; (ii) quality level; (iii) packaging and (iv) a brand name.

(i) Features

The use of features has many advantages. The institution can target specific market segments by selecting those features which would most strongly appeal to that particular group. Features are also tools for differentiating the institution's products from those of their competitors. This leads to Research Question 2:

What feature improvements do eCommerce/eBusiness and IS/IT academic programs provide to their offering institution?

(ii) Quality level

The Quality of a service is particularly important precisely because quality can vary so much, depending on the provider's skills, motivation, and mood. Whether College A will continue to attract enough students depends to a large extent upon the degree to which prospective students can obtain information and assurance of the quality of its offerings. Since this characteristic varies over time and between one university and another, however, it is outside the scope of the present study.

(iii) Packaging

Good packaging can add value beyond that perceived in the product itself. The university campus environment (both physical and academic) serves as the 'packaging' of the academic program. This leads to our Research Question 3:

Are there any differences in the packaging of eCommerce/eBusiness and IS/IT academic programs?

(iv) Branding

The products of an educational institution can be branded - that is, given a name, term, sign, symbol, or design, or some combination thereof, which identifies them with the institution and differentiate them from competitors' offerings. This leads to our Research Question 4:

What names are used for academic programs and teaching units for eCommerce /eBusiness and IS/IT categories and is there any additional evidence of 'branding' in these degrees?

The outer level of figure 2 is the augmented offer. The new competition is not between what educational institutions offer in the classroom, but is seen in terms of what they add to their standard offering in the form of packaging, services, advertising, financing, delivery arrangements, and other things people value. This provides our Research Question 5:

eBusiness education – and the rapid rate of uptake of eCommerce/eBusiness suggests that the difference may not last much longer. We also found that 65.8% of Australian and 25% of New Zealand universities offer both eCommerce/eBusiness and IS/IT academic programs simultaneously.

4. Core Benefits and Services

What are the ‘core’ benefits or services of the core products eCommerce/ eBusiness and IS/IT academic programs?

The core services of eCommerce / eBusiness and IS/IT academic programs are, above all, to provide knowledge and information in their areas. Our survey indicated that there are business and commercial subjects in eCommerce / eBusiness and IS/IT academic programs. eCommerce / eBusiness programs cover subjects / knowledge such as: WWW technology, internet technology, web site management, eCommerce policy and theory etc., while IS/IT programs cover subjects / knowledge such as systems analysis and design, programming, database, and communications/ networking. The Information Systems Curriculum document IS '97, published in the United States (Davis et al. 1997), sees the academic field of Information Systems as encompassing two broad areas: the acquisition, deployment and management of information technology resources; and the building and evolution of infrastructure and systems for information use in organisational processes. eCommerce and eBusiness, by contrast, are still 'young', and so far we have not found any model curricula for this study area. But in Deakin University's Bachelor of Commerce (eCommerce specialisation) degrees, eCommerce is broadly divided into two major areas: management and implementation (Deakin University 2000; 2000a).

When customers have received the complete service (i.e. when they have graduated, in academic terms), the benefit they anticipate is to increase their ability to compete successfully for jobs in their chosen marketplace. The Australian government's National Office of the Information Economy (NOIE) points out that: *'the demand for IT&T skills has risen strongly over the past decade. An adequate supply and appropriate mix of IT&T skills is crucial in ensuring that the skill requirements of industry are met'* (NOIE 2000). Chan and Swatman (2000) identified a number of different types of jobs for eCommerce/eBusiness graduates and briefly discussed the difference between these roles and those advertised for IS/IT graduates. A web site developed by the Commonwealth, State and Territory Government and Industry IT&T Skills Task Force initiative briefly describes Electronic Commerce Career (Ignite 2000). For details of subjects offered and job titles for each of products please refer to Appendix 2.

Clearly, given the very high rate of employment of IS/IT graduates, this benefit is being obtained by the ‘customers’ of the service. In the field of Computer Science study, 86.6% and 88.2% of graduates who gained their qualifications in 1998 and 1999 respectively were in full-time employment about four months after graduation (Graduate Careers Council of Australia 1999; 2000). Similar official figures are not

available for either IS/IT or eCommerce/eBusiness graduates, but anecdotal evidence from those academics charged with assisting students to find employment following graduation suggests that employment rates in both these areas are higher than Computer Science.

The 2000 Australian Computer Society (ACS) Remuneration Survey revealed that IT professionals in the private sector earned an average total package of \$103,460, compared to an average total package of \$95,279 across all sectors. *ACS President John Ridge said, "IT professionals in the private sector continue to command salary increases well above those experienced in other industries, ... , the growth of e-commerce and the demand for Internet and networking skills"* (ACS 2000). It is still a little too early to be entirely sure of whether the eCommerce/eBusiness degrees are providing a similarly successful outcome in terms of employment.

5. Feature Improvements

What feature improvements do eCommerce/eBusiness and IS/IT academic programs provide for their offering institution?

There are three different types of post-graduate academic program: masters degrees, graduate certificates and graduate/post-graduate diplomas. The various university handbooks and web sites confirm that masters programs should take 1.5 to 2 years to complete; graduate diplomas 1 year and graduate certificates 0.5 to 1 year to complete. Students 'usually' take 16, 8 and 4 subjects for the masters, graduate diploma and graduate certificate respectively. Postgraduate programs in Australasia are fee-based and students generally have to finance their studies themselves (with the exception of the fortunate few whose employers are willing to provide fee support). For a masters degree, course fees vary from A\$17600 to A\$32000, with the course fee for individual subjects ranging from A\$1100 to A\$2000.

Since both time and money may become overwhelming burdens to some students, many masters degrees provide exit points - if students successfully complete a certain number of subjects (normally 4) in specified areas, they can obtain a graduate certificate. After studying a further number of subjects (usually another 4, or 8 in total), they will be able to obtain a graduate diploma.

This 'early exit' feature allows the offering institution to target a variety of market segments, where segmentation can be viewed as financial and academic ability. From the perspective of the university, the resources (subjects offered) can be fully utilised. We found that both the eCommerce/eBusiness and IS/IT products have this feature.

A major opportunity for product differentiation lies in the teaching modes offered by the various institutions. Opportunities exist to teach subjects in a variety of ways:

- In 'normal', once a week classes throughout the semester
- In 'block mode', where classes are offered over a 1-2 week period, early in the semester, with assignments due later (and usually handed in electronically)

- In ‘intensive mode’ where classes take place over weekend days scattered throughout the semester – and where, again, assignments are managed electronically
- In off-campus or ‘distance’ mode, where student communicate entirely electronically with the institution.

In all these modes, there are also opportunities for taking greater or lesser advantage of the various computer-supported teaching packages currently available, which allow such things as ‘chat’ sessions, threaded discussions, and other electronic groupwork facilities. Our findings suggest that comparatively more bachelors degrees in eCommerce/eBusiness are delivered by distance-learning mode than is the case for IS/IT degrees – and they are more likely to be offered over the Web. At the Masters level, a number eCommerce / eBusiness programs are offered in an intensive or block mode.

6. Packaging of Programs

Are there any differences in the packaging of eCommerce/eBusiness and IS/IT academic programs?

There are significant differences in the ‘packaging’ of eCommerce/eBusiness academic programs from those offered by the same institutions for their IS/IT degree and diploma courses. While both types of program are advertised in the local newspapers, it is not uncommon to see major publicity activities focused on the eCommerce/eBusiness academic programs. These might involve paid advertising – but are also likely to include articles in the major daily newspapers or in business magazines, and may include regular spots on talkback radio by well-known lecturers from the offering institution. High-quality brochures are also available for the majority of eCommerce/ eBusiness programs and staff will distribute these as widely as possible.

Although universities advertise all their programs on their web sites today, only eCommerce/ eBusiness degrees have dedicated web pages (often highly sophisticated web sites, with online enrolment facilities and a host of value-added features related to the program). A brief comparison of the web sites provided by the majority of eCommerce/eBusiness offering institutions shows that significant amounts of time (and, one presumes, money) have gone into making these sites attractive and inviting to potential students. It is very common to see a senior academic leading these programs (something which is seen particularly in the more successful programs – those having the highest number of enrolments) and guest lecturers and invited speakers frequently feature on these publicly available web sites.

7. Naming and Branding

What names are used for academic programs and teaching units for eCommerce /eBusiness and IS/IT categories and is there any additional evidence of 'branding' in these degrees?

Academic programs

Branding, while not very heavily used in the IS/IT area, is very much a feature of the newer eCommerce/eBusiness degrees. The earliest offerings in this area made use of the terms eCommerce or Electronic Commerce, while later entrants to the market are increasingly utilising the term eBusiness (which is very much in line with market usage). The terms 'Internet Commerce' and 'Electronic Market' are also beginning to make an appearance, indicating both the desire for differentiation among institutions, and the awareness of brand perception by the marketplace. (For details of the names of the academic programs, refer to Appendix 1).

Teaching Units

Among the 43 Australian and New Zealand universities which offer IS/IT teaching, IS programs and subjects are sometimes offered by several teaching units (schools/departments) in the same university. For IS / IT name-related subjects (together with other terms such as management, multimedia, computing) in schools, departments and faculties, we were able to identify 11 different terms (refer to Appendix 3). For eCommerce, by contrast, there is currently no school or department entitled Electronic Commerce / Electronic Business.

Our survey results indicate that the majority of eCommerce/ eBusiness offerings can be found in teaching units with an IS/IT related name. This may be due to the fact that eCommerce / eBusiness has only become 'hot' over the past two years, and/or to the fact that the academic programs were mainly developed by existing teaching units (such as Faculty of Commerce, School of Information Systems). On the other hand, the history of IS/IT is relatively 'old', and hence more teaching units are still using the names 'Information Systems' or 'Information Technology'.

Are eCommerce / eBusiness and IS/IT offered by the same teaching units?

Amongst the 18 Australian universities offering both eCommerce/eBusiness and IS /IT bachelors programs, 11 universities offer both programs from the same teaching unit(s); while 7 universities offer them from different teaching units. These figures do not add any significance to this study. However, we found that in the case of those eCommerce/eBusiness and IS/IT bachelors programs offered by the same teaching units, the subjects contained in both programs tend to be very similar, differing only in a small number of subjects. However, where the bachelors degrees are offered by different teaching units, the subjects contained in each type of bachelor degrees differ significantly. This would indicate a certain amount of 'cross-selling' on the part of those teaching units offering both IS/IT and eCommerce/eBusiness programs. What the impact such an approach will have on the market-place remains to be seen.

Of the 2 New Zealand universities offering eCommerce / eBusiness and IS/IT programs, the bachelors degrees are offered by the same teaching units in both cases. Subjects are similar in the first year, but are different in the second and third years.

Amongst the 16 Australian universities which offer both eCommerce/ eBusiness and IS/IT postgraduate programs, programs are offered by the same teaching units in 9 universities; while 6 are offered by different academic teaching units. Curtin University of Technology is an exception to this rule, having a mix of programs offered both by the same teaching units and by different teaching units. Curtin's Master of Commerce (EC) and Master of Commerce (IS) are offered by the same teaching units – the School of Information Systems; but her Master of Electronic Commerce and Master of Information Technology are offered by different teaching units.

8. Augmented Offerings

What augmented offerings, such as accessibility, financing terms, follow-up service, or guarantees do the eCommerce /eBusiness and IS/IT academic programs provide?

Our survey did not identify any follow-up service specifically aimed at graduates of eCommerce/ eBusiness and IS/IT academic programs. The concept of targetting alumni of a particular program rather than caring for the entire group of that institution's graduates is still in its infancy in Australasia. We did interview some eCommerce / eBusiness program coordinators, who believed that alumni associations will help keep graduates together and also help in advertising the university through word of mouth.

Naturally, no institution is able to provide a guarantee to graduates of eCommerce/ eBusiness or IS / IT academic programs concerning their job prospects although, as we have pointed out above, high employment levels are a feature of these programs and are one of the attractions drawing students to study in this field.

9. Academic Programs in the e-Age

The Centre for International Economics (2000) reported that 45% of households (a total of more than 300 Australian households with home internet access) surveyed indicated that they used the Internet at home for information gathering tasks related to studies. 11% said that adults were enrolled in some form of course that required the use of the Internet at home. Studies in Australia and abroad consistently show that additional formal education brings rewards through improved average annual earnings. Lack of appropriate education can mean permanently lower earnings.

In the e-age, as the Internet and communication are comparatively more easily accessible, how do they affect academic programs?

Firstly, we found that today's academic programs are increasingly being delivered by 'on-line', 'web-course', 'e-learning', 'flexible study' or 'distance learning' approaches. Students can study their programs either at home or at work. Location and 'physical existence' of universities is not as high a priority as before in choosing the university at which one wishes to study. University managers are enthusiastic about the provision of online education – whether students and academics are equally enthusiastic is still very much a moot point. Arguments are provided both for and against the provision of online education – but it is very much a part of the 'branding' of newer programs such as eCommerce/eBusiness.

Secondly, students have comparatively easy and efficient access to information and can obtain from the web all the details of academic programs such as program structure, job opportunities and tuition fees. The subjects taken for eCommerce / eBusiness or IS/IT academic programs are not significantly different. So what is the key factor that attracts the prospectus students to particular universities or academic programs in the e-age? We believe that the 'positioning' of the universities or the academic programs is a higher priority. Increasingly, academic programs are being offered by groups of universities, rather than by a single institution. For example, a group of prestigious European and US universities, supported by a grant from the European Commission, are jointly offering a Master of eCommerce degree – the GEM program – which will provide an executive masters degree, based on a mix of online and residential education over a 15-month period (GEM 2000).

Thirdly, wireless technology as a delivery tool for academic programs may be used in the near future. The University of New South Wales has a funding project aiming to overcome problems in developing wireless mobile internet for video shopping (Campus Review 2000). The University of Southern Queensland, has introduced WebTablets, which are capable of accessing the internet, word processing and downloading simple graphics using wireless access networks to their on-campus students. Professor Jim Taylor, Deputy Vice-Chancellor at the University of Southern Queensland, said, "*What I see are the driving forces for e-commerce being the same driving forces for e-education; giving more personalised and more efficient service to students at a cost which is cheaper than manual systems is a trend I regard as inexorable. I believe the trend is towards e-delivery and e-communication with students whether they are on-campus or off-campus, and the efficiencies that are available in an e-interaction are storing those in an intelligent database,*" (Alcorn 2000). The University of Koblenz in Germany is developing a Hyper-Campus, which uses wireless technology to deliver a range of innovative services to staff and students across its geographically separated campuses (University of Koblenz 2000).

Finally, Stewart and Gable (1998) stated that *study to maintain professional competence must be flexible in terms of start and completion times in order to allow practicing professionals to fit the course into their demand life*. Should academics consider this idea for the eCommerce / eBusiness and IS /IT academic programs; particularly cope with our customers' requirements in this fast pace of e-age?

10. Conclusions

In the past, academic emphasis has tended to be placed upon the curricula of academic programs, i.e. what subjects at what levels are appropriate to be included in academic programs. This approach leads to the so called 'model curriculum' for particular study areas, e.g. IS '97 Model Curriculum. We do not deny that 'curriculum' is important to an academic program. But in this study, we have found that in the e-age, society expects 'efficient results' - a new academic program may be developed from scratch and offered to students within 6-12 months. So the issue of identifying teaching subjects which will form a new academic program (a curriculum) is not the only major factor in today's academic program development. Other criteria – such as the positioning of the university itself and its academic programs; the service quality of the offering - is there sufficient expertise to develop and deliver the new service product – all need to be considered when offering an academic program.

In the United States, a question arousing public debate is whether e-business should form a separate branch of business education or whether it should be part of everything that is taught. Prof. Saloner of Stanford University said, "*E-Commerce is not a distinct subject, not a discipline, ... , in the short term we will run specialised elective courses but our goal is to make them obsolete in three to five years.*" (Financial Times 2001). The implication is that universities need to think of their 'product services' in a manner which is far more similar to that taken by the manufacturers of consumer products than they have tended to do in the past. IS/IT programs are not yet as affected by this necessity as eCommerce/eBusiness programs, but it seems likely that the idea of academic programs as consumer products will spread from the fastest moving offerings to other degree programs in the not-too-distant future. Borland et al. (2000) stated that the evidence they had obtained indicated that (i) investment in higher education yields high returns to individuals, society and the government; and (ii) investing in the quality of education may be an important priority.

Our comparison of IS/IT programs with eCommerce/eBusiness programs showed a number of differences – primarily in terms of packaging and positioning, rather than in pedagogic terms – but also a number of significant similarities. As universities continue down the path of online program offering, they will find it increasingly important to differentiate themselves and their products. Branding will become crucial in the race to win high-quality students who are willing to pay high prices for their post-graduate (and, increasingly, for their under-graduate) education.

References

- ACM, AIS and AITP (1997) *IS'97 Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems*.
<<http://webfoot.csom.umn.edu/faculty/gdavis/curcomre.pdf>>, (Accessed 28 Apr 2001).

- ACS (2000) *IT Salaries Continue to Outstrip CPI*, June 30.
<<http://www.acs.org.au/news/300600.htm>>, (Accessed 28 Apr 2001).
- Alcorn, G. (2000) E-education - What the Future Holds, *Campus Review*, 16-22 August, p. 11.
- Alter, S., Scott, J., Ein-Dor, P., Vessey, I. and Markus, M. L. (2001) Does the Trend Toward e-Business Call for Changes in the Fundamental Concepts of Information Systems? A Debate, *Communications of the Association for Information Systems*, Volume 5, Article 10, April, pp.7-8.
<<http://cais.isworld.org/articles/5-10/default.asp?view=pdf>>, (Accessed 28 Apr 2001).
- Ang, A.Y. (1992) Australian Information Systems Curricula: A Comparison between the Views of Universities and TAFE Colleges, *Proceedings of Third Australian Conference on Information Systems*, Wollongong, Australia, 5-8 October, pp. 747-758.
- Ang, A.Y. and Lo, B.W.N. (1991) Changing Emphasis in Information Systems Curricula: an Australian Industrial Perception, *Proceedings ACC'91 MOSAIC*, Adelaide, 6-10 October, pp. 11-28.
- Arnott, D. Dampney, H. and Scollary, A (1996) The Australian Debate on Information Systems Curriculum, *Proceedings of the Australian Information Systems Curriculum Working Conference*, Melbourne, 24-25 September.
- Ashenden, D. and Milligan, S. (2000) *The Good Universities Guide to Universities. TAFE's and Private Providers*, Hobsons, Australia.
- Ashenden, D. and Milligan, S. (2000a) *The Good Universities Guide to Postgraduate and Career Upgrade Courses 2001*, Hobsons, Australia.
- Avison, D.E. (1993) Research in Information Systems Development and the Discipline of Information Systems, *Proceedings of 4th Australasian Conference on Information Systems*, Queensland, Australia, 28-30 September, pp. 1-27.
- Australian Vice-Chancellors' Committee (2001) *AVCC Member Universities*
<http://www.avcc.edu.au/australias_unis/individual_unis/index.htm>, updated on 4 December, (Accessed 28 Apr 2001).
- Boggs, R.A. (2000) Information Systems Education in an Interdisciplinary International Arena, *Proceedings of the 8th European Conference on Information Systems*, Vienna, Austria, 3-5 July, pp. 1392-1395.
- Borchers, A. S. (1998) Examples and Characteristics of IS/IT On-Line Syllabi in: *Association for Information Systems. Proceedings of the Fourth Americas Conference on Information Systems*, 14-16 August, Baltimore, Md. Eds. Ellen D. Hoadley, Izak Benbasat. Atlanta, pp. 1033-1035,
<<http://www.isworld.org/ais.ac.98/proceedings/track26/borchers.pdf>>, (Accessed 28 Apr 2001).
- Borland, J., Dawkins, P., Johnson, D. and Williams, R. (2000) *Returns to Investment in Higher Education Research Program Report No. 1*, Report to

- the Vice Chancellor, the University of Melbourne.
<<http://www.ecom.unimelb.edu.au/iaesrwww/pdf/rihe.pdf>>, (Accessed 28 Apr 2001).
- Bryant, K. (2000) Information Systems Education: The Effectiveness of Using Web Technology, *Proceedings of 11th Australasian Conference on Information Systems*, Brisbane, Australia, 6-8 December.
- Buckingham, R.A., Hirschheim, R.A., Land F.F. and Tully, C.J. (1987) Information Systems Curriculum: a Basis for Course Design in Buckingham et. al (ed.) *Information Systems Education: Recommendations and Implementation*, University Press, Cambridge, Great Britain, pp.14-133.
- Campus Review (2000) *UNSW Seeks a More Mobile Internet*, 12-18 July, p.19.
- Centre for International Economics (2000) *What's IT worth? Valuing the Benefits of Home Internet Access*, prepared for National Office for the Information Economy.
<<http://www.noie.gov.au/projects/access/online%5Faccess/save%40home/save%40home.pdf>>, (Accessed 28 Apr 2001).
- Chan, E.S.K. & Swatman, P.M.C. (2000). Electronic Commerce Careers: A Preliminary Survey of the Online Marketplace, *Proceedings of the 13th Bled Electronic Commerce Conference*, 19-21 June, Bled, Slovenia.
<<http://www.mis.deakin.edu.au/elsieEC/pdf/2000-1.pdf> >, (Accessed 28 Apr 2001).
- Chan, E. S. K. & Swatman, P.M.C. (2000a) B2C new service products in the 'e' age: eCommerce/eBusiness degree programs, *Proceedings of the Fifth COLLECTeR Conference on Electronic Commerce*, 13-14 December, Brisbane, Australia.
<<http://www.mis.deakin.edu.au/elsieEC/pdf/2000-2.pdf>>, (Accessed 28 Apr 2001).
- Chan, E.S.K. (2001) Universities which offer / are planning to offer eCommerce Course/Program in Australia.
<http://www.mis.deakin.edu.au/elsieEC/au_U.htm, (Accessed 28 Apr 2001).
- Chan, E.S.K. (2001a) Universities which offer / are planning to offer eCommerce Course/Program in New Zealand.
<http://www.mis.deakin.edu.au/elsieEC/nz_U.htm>, (Accessed 28 Apr 2001).
- Clarke, R. (1996) Industry and Professional Viewpoints on IS Courses Summary of a Presentation to the Australian IS Curriculum Working Conference, *Proceedings of the Australian Information Systems Curriculum Working Conference*, Melbourne, September 24-25, pp.82-84.
- Clarke, R. (1999) *Comments on Information Systems Curriculum*.
<<http://www.anu.edu.au/people/Roger.Clarke/SOS/ISCurric.html>>, updated on 1 October, (Accessed 28 Apr 2001).

- Comley, P. (1996) *The Use of the Internet as a Data Collection Method*, ESOMAR/EMAC Symposium, November.
<<http://www.virtualsurveys.com/papers/email.htm>>, (Accessed 28 Apr 2001).
- Davies, P. and Deshpande, Y. (1995) Student Projects in information Systems: A Case Study, *Proceedings of the 6th Australasian Conference on Information Systems*, Curtin University, Perth, Australia, 26-29 September, pp.267-275.
- Davis, G. B., Gorgone, J.T., Couger, J.D., Feinstein, D. L. and Longenecker, H.E. (1997) *Model Curriculum and Guidelines for Undergraduate Degree Programs in Information Systems*, Association for Computing Machinery, Association of Information Systems, Association of Information Technology Professionals.
- Davis, C., Hajnal, C., de Matteis, D. and Henderson, M. (1999) *Management Skill Requirements for Electronic Commerc*, pp19-38,
<http://business.unbsj.ca/users/cdavis/papers/Ecomm_mgt_skills_IC_report.pdf>, (Accessed 28 Apr 2001).
- Deakin University (2000) *Electronic Commerce Management Major*,
<http://mis.deakin.edu.au/Course_info/Under_grad/Ecomm_Mgmt.htm>, (Accessed 28 Apr 2001).
- Deakin University (2000a) *Electronic Commerce Implementation Major*,
<http://mis.deakin.edu.au/Course_info/Under_grad/Ecomm_Impl.htm>, (Accessed 28 Apr 2001).
- Dhamija, R., Heller, R. and Hoffman, L. (1999) Teaching E-Commerce to a Multidisciplinary Class, *Communications of the ACM* (42:9), September.
- Fielden, K. (1990) Facts, Skills and Creativity: An Innovative Approach to Learning in Information Systems, *Proceedings of First Annual Conference on Information Systems*, Monash University, Melbourne, Australia, 6 February, pp. 2-14.
- Financial Times (2001) *Putting e-business in Its Places*.
<<http://globalarchive.ft.com/globalarchive/articles.html?print=true&id=010115004672>> 15 January, (Accessed 28 Apr 2001).
- Fink, D. and Shafran, M. (1993) Key Issues in Information Systems in Management - Perceptions of Final Year Information Systems Students, *Proceedings of 4th Australasian Conference on Information Systems*, Queensland, Australia, 28-30 September, pp. 129-143.
- Ge, Y. and Sun, J. (2000) E-Commerce and Computer Science Education, *Proceedings of the thirty-first SIGCSE technical symposium on Computer science education*, 7-12 March, Austin, TX USA, pp.250-255,
<<http://www.acm.org/pubs/articles/proceedings/cse/331793/p250-ge/p250-ge.pdf>>, (Accessed 28 Apr 2001).
- GEM (2000) <<http://www.heltrun.aueb.gr/gem/gem.htm>>, (Accessed 28 Apr 2001).

- Graduate Careers Council of Australia (1999) 1999 Graduates: Work, Study, Salaries and Course Satisfaction - Main Points, December, <<http://www.gradlink.edu.au/gradlink/gcca/GradStats1999.pdf>>, (Accessed 5 Feb 2001).
- Graduate Careers Council of Australia (2000) 2000 Graduates: Work, Study, Salaries and Course Satisfaction - Main Points, December, <<http://www.gradlink.edu.au/gradlink/gcca/GradStats2000.pdf>>, (Accessed 28 Apr 2001).
- Grover, V (2000) *A Tutorial on Survey Research: From Constructs to Theory*, <<http://dmsweb.badm.sc.edu/grover/survey/MIS-SUVY.html>>, (Accessed 28 Apr 2001).
- Hampe, J.F. (1998) Electronic Commerce in Universities: A Case Study Report from the University of Koblenz, Germany, *Proceedings of the Eleventh International Bled Electronic Commerce Conference*, Bled, Slovenia, 8-10 June, p.128.
- Hecht, I. (2000) "e": The Millennial Reality for Business and Education, *Proceedings of New Zealand Diploma of Business Conference*, Christchurch, New Zealand, 5-7 July.
- Ignite (2000) *Careers in E-Commerce* <<http://www.ignite.net.au/careers/ecommerce.asp>>, (Accessed 28 Apr 2001).
- Joyce, P. (2000) A Virtual Teaching Environment for Electronic Commerce, *Proceedings of the 8th European Conference on Information Systems*, Vienna, Austria, 3-5 July, pp. 1368-1375.
- Keen, C. (2001) *Australasian Information Systems Departments*, <<http://www.infosys.utas.edu.au/info/isdepts.html>>, (Accessed 1 Feb 2001).
- Kotler, P. and Fox, K.F.A. (1995) *Strategic Marketing for Educational Institutions*, Prentice-Hall, New Jersey, pp.277-282.
- Lawrence, E. (1991) Look, No Lectures! *Proceedings ACC'91 MOSAIC*, Adelaide, 6-10 October, pp. 373-385.
- Lo, B.W.N. (1989) A Survey of Information Systems Educational Programmes in Australian Tertiary Institutions, *Working Paper Series No. 1, Department of Information Systems, The University of Wollongong*.
- Lo, B.W.N. and McNutt, L.J. (1991) The Cognitive Dimensions of Computer Programming: Implications for Teaching Programming in Information Systems Courses, *Proceedings of the Second Annual Conference on Information Systems and Database Special Interest Group*, 4-5 February, University of New South Wales, Australia, pp.356-371.
- MacElroy, B. (1999) Comparing Seven Forms of on-line surveying, *Quirk's Marketing Research Review*, Article No. 0510, July, <http://www.quirks.com/articles/article_print.asp?arg_articleid=510>, (Accessed 28 Apr 2001).

- McCubbrey, D. (1999) Designing an Electronic Commerce Curriculum, *Communications of the Association for Information Systems* (1:2).
<http://cais.aisnet.org/articles/default.asp?vol=1&art=2_>, (Accessed 28 Apr 2001).
- Mesenbourg, T.L. (1999) Measuring Electronic Business: Definitions, Underlying Concepts, and Measurement Plans.
<<http://www.ecommerce.gov/ecomnews/e-def.html>>, (Accessed 28 Apr 2001).
- Mills-Jones, A. (1999) Active Learning in IS Education: Choosing Effective Strategies for Teaching Large Classes in Higher Education, *Proceedings of 10th Australasian Conference on Information Systems*, Wellington, New Zealand, 1-3 December, pp.622-633.
- New Zealand Ministry of Economic Development (2000) *E-Commerce - a Global Challenge*, <<http://www.ecommerce.govt.nz/>>, (Accessed 28 April 2001).
- New Zealand Vice-Chancellors' Committee (2001) *Members of the NZVCC / The New Zealand Universities*.
<<http://www.nzvcc.ac.nz/aboutnzvcc/member.html>>, updated on 5 March, (Accessed 28 Apr 2001).
- Nickerson, R. C. (2000) Information Systems vs. Information Technology
<<http://online.sfsu.edu/~rnick/isit.doc>>, (Accessed 28 Apr 2001).
- NOIE (2000). *ICT skills*. The National Office of the Information Economy website.
<<http://www.noie.gov.au/projects/ecommerce/skills/index.htm>>, (Accessed 28 Apr 2001).
- Office of Information and Communications (1998) *Western Australian Electronic Commerce Centre*.
<<http://www.ecommercecentre.online.wa.gov.au/main/index.stm>>, (Accessed 28 Apr 2001).
- Parker, C. and Swatman, P.M.C. (1999) Web-TRECS: The Design and Use of an E-Commerce Business Simulation, *Proceedings of Twelfth International Bled Electronic Commerce Conference*, Bled, Slovenia, 7-9 June, pp. 487-512.
- RMIT University (2000) *RMIT participates in world launch of the Global University Alliance*, Oct. 12. <http://www.rmit.edu.au/cgi-bin/news/news.cgi?v=archive&c=Latest_RMIT_Media_Releases&id=1012200013564>, (Accessed 5 Feb 2001).
- Silver, M.S., Markus, M.L. and Beath, C.M. (1995) The Information Technology Interaction Model: A Foundation for the MBA Core Course. *Management Information Systems Quarterly*, Vol. 19. No. 3, September, pp.361-390.
<<http://www.stern.nyu.edu/~msilver/mbacore/itmodel.htm>>, (Accessed 28 Apr 01).

- Smith, C.B. (1997) Casting the Net: Surveying an Internet Population. *Journal of Computer Mediated Communication*, 3(1).
<<http://www.ascusc.org/jcmc/vol3/issue1/smith.html>>, (Accessed 28 Apr 2001).
- Stewart, G. and Gable, G. (1998) Developing a Flexible Delivery Program for Post-Graduate Studies in Information Systems in: *Association for Information Systems. Proceedings of the Fourth Americas Conference on Information Systems*, 14-16 August, Baltimore, Md. Eds. Ellen D. Hoadley, Izak Benbasat. Atlanta, pp. 1091-1093,
<<http://www.isworld.org/ais.ac.98/proceedings/track26/stewart.pdf>>
(Accessed 28 Apr 2001).
- Swatman, P. M.C. and Chan, E.S.K. (2001) Report from the Panel on Teaching Electronic Commerce Fourth Pacific Asia Conference on Information Systems, 1-3 June 2000, Hong Kong, SAR, *Deakin University Working Paper Series 2001/11*,
<http://mis.deakin.edu.au/research/Working_Papers_2001/2001_11_Chan.pdf>, (Accessed 28 Apr 2001).
- Swatman, P.M.C., Chan, E.S.K. (2001a) eCommerce/eBusiness Education: Pedagogy or New Product Development? In: Werthner H. and Bichler M. (Eds) (2001) *Readings in E-Commerce*, Springer-Verlag, **to appear**.
- Tatnall, A. (1993) *A Curriculum History of Business Computing in Victorian Tertiary Institutions from 1960-1985*, Masters thesis, Deakin University, Geelong.
- Tatnall, A. (1999) *Innovation and Change in the Information Systems Curriculum of an Australian University: a Socio-Technical Perspectives*, PhD thesis, Central Queensland University.
- Univeritas21 (2000) *A Network for International Higher Education*
<<http://www.universitas21.com/>>, (Accessed 28 Apr 2001).
- University of Koblenz (2000) Hyper Campus
<<http://www.uni-koblenz.de/~uli/HYPER/dream.html>>, (Accessed 28 Apr 2001).
- Westfall, R. D. (1997) Using the Learning Needs Model for Introductory Information Systems Classes, *Decision Sciences Institute Annual Meeting*, San Diego, CA, November 22-25.
<http://www.cyberg8t.com/westfalr/lrn_need.html>, (Accessed 28 Apr 2001).

Appendix 1

Universities offer both eCommerce/eBusiness and IS/IT academic programs.

Name of University	eCommerce (EC) / eBusiness (EB) programs <i>(Teaching Units)</i>	Information Systems (IS) / Information Technology (IT) programs <i>(Teaching Units)</i>
Australia		
Bond University	Bachelor of Electronic Commerce Master of Electronic Commerce <i>(School of Business)</i>	Bachelor of Information Systems Bachelor of Information Technology Master of Information Technology <i>(School of Information Technology)</i>
Central Queensland University	Bachelor of Electronic Commerce Master of Electronic Commerce <i>(Faculty of Informatics & Communication)</i>	Bachelor of Information Technology Master of Information Systems <i>(Faculty of Informatics & Communication)</i>
Charles Sturt University	Master of Electronic Commerce <i>(Faculty of Commerce)</i>	Master of Information Technology <i>(School of Information Technology)</i>
Curtin University of Technology	Bachelor of Commerce (EC Major) Bachelor of Commerce (EC)(Honours) Master of Commerce (EC) <i>(School of Information Systems)</i>	Bachelor of Commerce (IS major) Bachelor of Commerce(IS)(Honours) Bachelor of Commerce (IT major) Master of Commerce (IS) <i>(School of Information Systems)</i>
Deakin University	Bachelor of Commerce (EC) Master of Commerce (EC) <i>(School of Information Systems)</i>	Bachelor of Commerce (MIS) Master of Commerce (MIS) <i>(School of Information Systems)</i>
Edith Cowan University	Bachelor of Business (EC) Masters of Electronic Commerce <i>(School of Management Information Systems)</i>	Bachelor of Business (IS) Masters of Management Information Systems <i>(School of Management Information Systems)</i>
Griffith University	Master of eCommerce <i>(School of Computing and Information Technology)</i>	Master of Information Technology <i>(School of Computing and Information Technology)</i>
La Trobe University	Bachelor of Electronic Commerce <i>(School of Business)</i>	Bachelor of Information Systems <i>(Department of Computer Science and Computer Engineering)</i>
Macquarie University	Postgraduate Certificate in E-Commerce Management Postgraduate Diploma in E-Commerce Management <i>(Division of Information and Communication Sciences)</i>	Postgraduate Certificate in Information Systems Postgraduate Diploma in Information Systems <i>(Division of Information and Communication Sciences)</i>
Monash University	Bachelor of Electronic Commerce <i>(School of Multi Media Systems)</i> Graduate Certificate in EC Graduate Diploma in EC <i>(School of Business and Electronic Commerce)</i>	Bachelor of Information Management and Systems Graduate Certificate in IS Graduate Diploma in IS <i>(School of Information Management and Systems)</i>

Name of University	eCommerce (EC) / eBusiness (EB) programs (Teaching Units)	Information Systems (IS)/ /Information Technology (IT) programs (Teaching Units)
Murdoch University	Bachelor of Commerce (EC) Graduate Diploma in EC (School of Commerce, Division of Business, IT and Law)	Bachelor of Science in IT Graduate Diploma in IS (School of Information Technology, Division of Business, IT and Law)
The University of New England	Graduate Certificate in E-Commerce (Faculty of Economics Business and Law)	Graduate Certificate in IT (Faculty of the Sciences)
The University of New South Wales	Graduate Certificate in Commerce in E-Business Management Graduate Diploma in Commerce in E-Business Management Master of Commerce in E-Business Management (School of Information, Technology and Management)	Graduate Certificate in Commerce in IS and Management Graduate Diploma in Commerce in IS and Management Master of Commerce in Information Systems and Management (School of Information, Technology and Management)
The University of Newcastle	Bachelor of Information Science (Marketing and EC) (Faculty of Economics and Commerce)	Bachelor of Information Science (Information Systems) (Faculty of Economics and Commerce)
The University of Queensland	Bachelor of Electronic Commerce (Department of Commerce)	Bachelor of Information Technology (Faculty of Engineering, Physical Sciences and Architectures)
Royal Melbourne Institute of Technology	Master of Business (E-Business) (School of Business Information Technology)	Master of Business (IT) (School of Business Information Technology)
Southern Cross University	Bachelor of Business (EC) (School of Business)	Bachelor of Business (IS) (School of Business)
University of South Australia	Bachelor of Computing (EC) (School of Computer and Information Science) Master of Business (e-Business) (Division of Business and Enterprise)	Bachelor of IT (EC) (School of Computer and Information Science) Master of Business (MIS) (Division of Business and Enterprise)
Swinburne University of Technology	Master of eBusiness and Communication (Centre for eBusiness and Communication)	Master of Information Systems Master of Information Technology (School of Information Systems)
University of Tasmania	Bachelor of Information Systems (EC) (School of Information Systems)	Bachelor of Information Systems (IS) (School of Information Systems)
University of Technology, Sydney	Bachelor of Business (EBusiness) Graduate Certificate of E-Business Management (Faculty of Business)	Bachelor of Business (IT) Graduate Certificate in Information Technology (Faculty of Information Technology)
Victoria University	Bachelor of Business in EC (School of Information Systems)	Bachelor of Business in IS (School of Information Systems)
The University of Western Australia	Bachelor of Commerce (Electronic Commerce) (Department of Information Management and Marketing)	Bachelor of Commerce (Information Management) (Department of Information Management and Marketing)

Name of University	eCommerce (EC) / eBusiness (EB) programs (Teaching Units)	Information Systems (IS)/ /Information Technology (IT) programs (Teaching Units)
University of Western Sydney	Bachelor of Commerce (E-Business) (School of Computing and Information Systems)	Bachelor of Information Technology (School of Computing and IT)
University of Wollongong	Bachelor of Commerce (Electronic Commerce and Business Information Systems) (Faculty of Commerce)	Bachelor of Information and Communication Technology (Business Information Systems/ Electronic Commerce) (School of Information Technology and Computer Science)
New Zealand		
Auckland University of Technology	Bachelor of Business (eBusiness) (Business Faculty)	Bachelor of Business (IT) (Business Faculty)
Victoria University of Wellington	Bachelor of Commerce and Administration (Electronic Commerce and Multimedia) (School of Communications and Information Management)	Bachelor of Commerce and Administration (Information System) (School of Communications and Information Management)

Appendix 2

Some Examples of Subjects Offered by the Teaching Units

Commerce / Business	eCommerce / eBusiness	IS / IT
Advertising	Communication in the Internet Age	Algorithms, Data Structures and Compilers
Analysis of Business	Concepts in Electronic Commerce	Artificial Intelligence
Business and Personal Finance	Constructing Cyberspace	Business Data Communications
Business Communication	Cyberlaw	Business Information Systems
Business Environment	eCommerce Security	Computer Security
Business Mathematics	eCommerce Systems/Networks	Data Communications
Business Statistics	eCommerce Project Management	Data Communications and Networks
Commercial Computing	E-Commerce Risk and Security Management	Data Security
Communication Skills	Web Tools	Database
Communications	Economics of Electronic Commerce	Database Management
Computer Programming for Business	Electronic & Desktop Publishing	Database Systems
Consumer & Buyer Behaviour	Electronic Commerce	Digital Media
Consumer Behaviour	Electronic Commerce & Organisational Structures	Discrete Mathematics
Contemporary Issues in Law & Society	Electronic Commerce (Electronic Commerce Applications)	Distributed Computing Technologies
Contract Law	Electronic Commerce (Electronic Commerce Technologies)	Distributed Environments
Cultural & Ethical Values	Electronic Commerce (Global Information Systems)	Distributed Technologies
Data Mining	Electronic Commerce (Internet Functions and Facilities)	Foundations of Business Computing
Economics of Information & Networks	Electronic Commerce (Internet Security)	Fourth Generation Languages
Financial Accounting	Electronic Commerce (Web Site)	Fundamentals of Computing
Financial Accounting & Company Reporting		Human Context of Information Systems
Foundations of Law		Information Management
Foundations of Management		

Commerce / Business	eCommerce / eBusiness	IS / IT
Human Resource Management	Management)	Information Systems
Industrial Marketing	Electronic Commerce Advertising and Promotion on the Internet	Information Systems & the Organisation
International Business Environment		Information Systems Development
International Marketing	Electronic Commerce and Virtual Organisations	Information Systems Methods & Techniques
Introduction to Accounting	Electronic Commerce Applications	Information Systems Project Specification
Introduction to Economics	Electronic Commerce Law	Information Systems Strategy and Management
Introduction to Management and Organisational Behaviour	Electronic Commerce Project	Information Technology
Introduction to Professional Communication	Electronic Marketing	Intelligent Systems for Business
Introductory Business Statistics	Implications of Electronic Commerce	Introduction to Information Systems
Investment Marketing	E-marketing and retail selling	Introduction to Information Technology
Law (Contract)	Internet Commerce	Introduction to Multimedia and the Internet
Legal Studies	Internet Technology	Introduction to Multimedia sSystems
Macroeconomic Management	Introduction to Electronic Commerce	Introduction to Programming Concepts
Management Accounting	Management with E-Commerce Applications	Introduction to Programming Using C++
Management and Legal	Marketing on the Internet	Introduction to Software Engineering
Management Communications	Multimedia and the Internet	Knowledge Systems
Management Entrepreneurship	Multimedia on the Web	Management Information Systems
Managerial Economics	Politics and the Internet	Management Support Systems
Managerial Planning & Control	Principles of Electronic Commerce	Enterprise Systems with SAP
Auditing	Security and the Internet	Mathematical Techniques for Information Technology
Market Research & Analysis	Web Commerce Development	Multimedia Systems
Marketing		Network Management
Marketing Principles		Object Oriented Data Engineering
Marketing Principles & Practice		Object Oriented Programming
Marketing Research		Principles of Information Systems
marketing,		Project Evaluation Information Analysis
Microeconomic Principles		Project Management
Operations Management Decision Analysis		Software Design
Organisational Informatics		Software Development
Principles of Commercial Law		Software Engineering Information
Introduction to Accounting		Software Engineering Project
Professional Communications		Software Internationalisation
Professional Issues		Strategic Information Systems Management
Promotional Design & Planning		System Description Techniques
Public Relations		Systems Analysis
Public Speaking		
Retail Management		
Service Marketing		
Statistics for Business		
Strategic Marketing		
Strategic Marketing Management		
Total Quality Management		
Using Accounting for Decision making		

Commerce / Business	eCommerce / eBusiness	IS / IT
		Systems Analysis and Design Systems Design Systems Development Systems Implementation Systems Modelling Technology Systems User Interface Engineering

Some Examples of Job Titles on eCommerce/eBusiness and IS/IT fields.

eCommerce/eBusiness	IS/IT
Analyst Programmer - Cold Fusion ASP Programmer Developer in Internet Developer in Java E-Business Development Manager E-Commerce Account Manager E-Commerce Architect E-Commerce Business Analyst E-Commerce Business Strategist E-Commerce Designer E-Commerce Development Manage E-Commerce Executive Manage E-Commerce Network Administrator E-Commerce Product Manager E-Commerce Sales E-Commerce solicitor/barrister/attorney E-Commerce Specialist E-Commerce Systems Architect E-Commerce Systems Technical Leader E-Commerce Technical Architect Electronic Commerce Web Developer HTML Developer Internet Systems Designer Java Database Developer Lead Web Designer Lecturer in E-Commerce/E-Business Perl Programmer Professor / Assoc. Professor of eCommerce/eBusiness Progress Programmer Systems Architect - Internet Development Technical Web Team Leader Web Consultant Web Database Developer Web Director Web Engineer Web Programmers Web Site Coordinator Web Specialist	Applications Development Manager Applications Software Developer Assoc. Prof. / Prof. In IS/IT C++ Programmer C++/Unix Analyst Database Analyst - SQL Server ERP/CRM Consultant I.T. Engineer Lecturer in IS/IT Multimedia Author Network Administrator Network Operations Engineer OO developer Oracle DBA Oracle Project Manager Professional Services Manager Project Director Project Manager Security services/ Risk Management Lead Consultant Senior Analyst Programmer Senior Developer Software Developer Software Engineer System Analysis System Tester Systems Administrator Systems Engineer Team Leader Technical Development Manager Technical Specialist Technical Support Manager Unix Systems Administrator Visual Basic Programmer

Appendix 3

Number of teaching units using the names Information Systems and Information Technology.

Name of Teaching Units (Division / School / Department) of	Number
<i>Information Technology</i>	7
<i>Business Information Technology</i>	1
<i>Information Technology</i> and Computer Science	1
Computing & <i>Information Technology</i>	2
Multimedia and <i>Information Technology</i>	1
<i>Information Systems</i>	9
Computing and <i>Information Systems</i>	2
Management <i>Information Systems</i>	2
<i>Information Systems</i> and Management Science	2
Accounting and <i>Information Systems</i>	1
Accounting, Finance and <i>Information Systems</i>	1