



What Should University Courses Teach Graduates So They Can Be Successful E-Business Analysis For SMEs

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ABSTRACT

While the vast amount of literature points to the benefits of adopting e-commerce as a tool to improve efficiency, reducing transaction costs, broaden the customer base, open up new markets, the provision of faster and more reliable communication by using new technologies and the Internet. Small-to-medium enterprises (SME's) in Australia have not rushed to become early adopters and regardless of Federal and State Government initiatives such as awareness and training courses, an infrastructure environment conducive for the adoption of e-commerce as well as financial incentives, SME's concerns for not engaging in e-commerce highlight the need for our undergraduate and postgraduate courses to equip our professionals with skills sets that focus on e-business strategic planning as well as the e-commerce technology skills that will enable them to design, develop and implement an e-business strategy that meets the need of the SME.

Since SME's do not have a vast budget or knowledge of e-commerce development, they are more likely to contract a consultant from their local community rather than from a major firm with employees having a range of specialist skills. This paper will focus on the skills required by a professional consultant working with an SME within their local community requiring a balanced mix of e-business and e-commerce technical skills combined with communication and leadership qualities. The result being a higher level of ownership and self-confidence by the SME when adopting Internet technologies.

INTRODUCTION

Although there are many and varied definitions for electronic commerce, Lawrence & Lawrence (2000) use the definition 'buying and selling of information, products and services via computer networks today and in the future, using any one of the myriad of networks that make up the Internet'. Katakota & Whinston (1996) define e-commerce as 'a modern business methodology that addresses the needs of organizations, merchants, and consumers to cut costs while improving the quality of goods and services and increasing the speed of service delivery', or as Fellenstein & Wood (2000) define, 'the use of online facilities for doing business ... Internet, intranets, extranets, private networks, and other networking facility that enables buyers to communicate with sellers (or supplier) ... a set of buying and selling activities of goods and services that make up a business transaction'.

While many writers use the term e-commerce and e-business interchangeably (Schneider & Perry, 2000), many of the courses offered by universities use the terms e-commerce and e-business without making any real distinction leaving one to wonder why the two terms exist. Fellenstein & Perry et.al. use the term e-business in the broader sense by associating a 'Design Quality model [that] helps enterprises establish business environments that provide new e-business values, environments that are secure, well protected, well designed, available 24 hours a day, 7 days a week (on 24x7) the entire year, and highly'. This model introduces a new element into the field of electronic commerce by introducing the concept of a metrics as a way of measuring the business environment for its success in terms of 'usability, scalability, interoperability, and maintainability' by going one stage further than simply designing, developing and implementing an e-commerce solution with the latest development tools and programming language scripts. Adding to the problem and confusion for the consultant is the fact that there are many SME's who do not even have a basic business and marketing plan. Sussis (2000) an e-commerce consultant states that, 'as businesses move into significant e-businesses, good planning strategies, design and implementation becomes more and more essential'.

This means that the consultant normally working by themselves with an SME, needs a skills set that goes further than simply teaching the broad concepts of e-commerce technologies by integrating with it

the total business environment. The integration of e-commerce technologies with an e-business strategy delivers to the SME the predicted outcomes they have identified and written into the e-business strategic plan. In most cases, the consultant have to first work with the SME to develop their business plan before attempting to develop an integrated e-business solution that builds on existing strategies. Care should be taken to ensure the emphasis is not simply placed on developing a web presence at the expense of developing the e-business strategy which complements the business and marketing plan. 'The adoption of online technologies does not replace business processes (such as ordering, supply and delivery), but has the potential to change the way these processes are performed and improve a firm's profit margin' (DISC:1998)

The level of success can be determined by how well the e-business analyst can 'leverage the organization's existing core operational business systems, as well as meet the new business-critical operational requirements for reliability, scalability, flexibility and 24x7x365 availability in a highly volatile, electronic marketplace' (Agarwal:2001). This means that there are many more elements that come into effect other than the selection and use of technology and the design of a well structured website, but include business courses in strategic issues in the digital economy, leadership, international marketing, global regulatory systems, supply chain management, business law and ethics as well as the traditional courses in e-commerce technologies, security and web design.

BACKGROUND

The Australian Bureau of Statistics (ABS) have produced various reports on business activity in Australia, and of the estimated 1,107,000 private sector businesses operating in Australia during the 1998-99 year, 1,055,300 were classified as small businesses employing 3.1 million people or approximately 50.2% of the total workforce (ABS:2000). The Yellow Pages Small Business Index (2000) identifies a small business as one which has 'up to 19 full-time employees including the proprietor if he or she is part of the workforce [and] medium-sized business employing between 20 and 200 full-time persons'. In addition to this definition, the Australian Bureau of Statistics (ABS) have identified another category of business operators within this sector, the

'Very Small Business (VSB) who employ fewer than 5 employees (ABS:2000).

With approximately 25% of small business and 56% of medium businesses surveyed in the 'Survey of Computer Technology and E-Commerce in Australian Small and Medium Business' (NOIE:2000) reported having a homepage, using the Internet for e-commerce sales accounts for only 0.4% with only 6% of Australian businesses at all levels being classified as Internet commerce active at the end of June 2000. What is more startling in these sets of figures is that only 2% of businesses generate 50% or more of their sales over the Internet (ABS:2000). It is unfortunate that the ABS figures do not provide a greater breakdown of Internet active SME's by industry sector as we would have a greater understanding of the e-business potential for our graduates and focus on course content that can deliver specific objectives rather than a generalised course outcome. Based on a sample of course outlines from the 30 Undergraduate and Postgraduate Electronic Commerce / Electronic Business courses located on the Australian Vice-Chancellors' Committee Member Universities website (http://www.mis.deakin.edu.au/elsieEC/au_U.htm), the stated objective is to provide a broad knowledge of commerce and business-related topics, together with in-depth knowledge needed to acquire expertise in electronic commerce systems.

While course outlines detail specific technologies for online transaction processing, web page design, development and implementation, programming languages, text formatting and script writing, data communications, analysis, metrics and other techniques for conducting B2B, B2C and B2G commerce and the supply chain, there is very little emphasis placed on providing course content and experience for the student in working through a framework that an SME can use that has specific steps and procedures to follow. Each step within the framework highlights issues that assist the SME to take a bricks-n-mortar business to become an active bricks-n-click enterprise and an adopter of Internet technologies.

In the final report 'SME Electronic Commerce Study' by PricewaterhouseCoopers (1999) for the Asian Pacific Economic Cooperation (APEC) on the adoption of electronic commerce, reasons for not adopting Internet technologies provided by the 21 member nation economies include:

- Low use of electronic commerce by customers and suppliers;
- Concerns about security aspects of electronic commerce;
- Concerns about legal and liability issues;
- High costs of computer and networking technologies;
- Limited knowledge of e-business models and technologies;
- Unconvinced of the benefits of electronic commerce for the company; and
- Quality of telecommunications services inadequate for e-commerce.

The reasons offered by SME's in Australia for not engaging in e-commerce outlined in the Small Business Index (2000) identify similar reasons for not engaging in e-commerce:

- A concern that the use of the Internet for e-commerce could lead to uncontrolled growth
- Satisfaction with current business arrangements
- Uncertainty about the quality and availability of products, and about delivery and supply arrangements
- Fear of alienating intermediaries
- Concern about not having enough understanding of technology to be able to manage and direct the adoption of e-commerce, and about how these skills would be assessed
- Time and expense
- A belief that the business products or services did not lend themselves to the Internet

To overcome these concerns for not adopting e-commerce by SME's both local and global, university graduates in e-commerce/e-business courses must possess the knowledge and skills of an e-business analyst who will take on a leadership role, empowering the SME to take on a higher degree or responsibility for the development of the e-business strategic plan so they have ownership over the project, raise

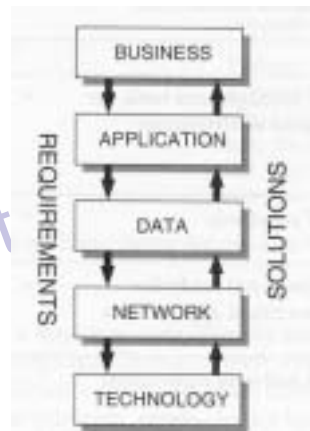
awareness, develop self-confidence, leading to a success implementation. The Australian Computer Society (ACS) 'Careers In Information Technology' handbook (1998) defines the duties of a business analyst as 'providing more detailed project objectives, system requirements, business process analysis and cost-benefit analysis'. The ACS defines the personal qualities of the Internet and e-commerce business analyst as being a person who has:

- a business outcome approach
- an ability to conceptualise and think creatively a capacity to articulate visions
- very good oral and written communications skills
- interpersonal skills to evoke commitment from the client
- sound administrative skills and good analytical and reporting abilities
- effective time management and personal organization skills
- an understanding of user needs

STRUCTURED METHODOLOGY

Most lecturers' in electronic commerce programs have an Information Systems background and therefore would be aware of the 'Top-Down Model' used by business analysts as a logical approach for determining the technology specifications that support the business needs and requirements as described by Goldman, Rawles & Marga (1999). The emphasis in this model is in the business layer where the focus is on the analysis of the business objectives as the starting point and should also be the starting place for e-commerce adoption and diffusion.

Figure 1: Top-down model



The first layer is to state the business-level objectives and this determines all other levels finally resulting in the use of appropriate technologies to meet business needs:

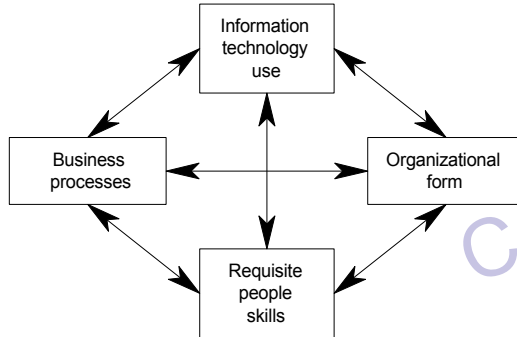
- Strategic business planning
- Business process reengineering
- Identification of major business functions
- Identification of business processes
- Identification of business opportunities

For the e-business analyst, this will be the most challenging aspect of their consultancy as the SME has to focus on the what, how, where and the why of their business.

Using this model for analysing the business needs when developing the e-business strategy, the e-commerce professional will need to develop skills in what Davenport & Short (1990) and Sawy (2001) call the 'Business Process Redesign' or 'Business Process Reengineering' (BPR). BPR is the analysis and design (redesign) of workflow and processes within and between organisations as information technology is used for doing business. Enterprises moving from a bricks-n-mortar to bricks-n-click operation use BPR principles and methodologies to make changes in the traditional way of carrying out transactions to

the virtual environment using real-time access with Internet technologies and web interfaces that should result in greater efficiencies. The figure 2 how the principles of BRP are used in the process of transforming a conventional business into an e-business and the interactions that take place.

Figure 2: Factors that interact with business process change



STRUCTURE OF AN E-BUSINESS PROGRAM

Specific e-commerce/e-business topics to be included in these courses that be considered when designing a program and be those that develop the skills set of the e-business analyst so they can work with an SME. However these topics and courses should be supplemented with business courses so the graduate has a total exposure to the business environment in which the strategy is to be implemented. Topics/courses that should be considered include;

(a) Strategic Issues in the Digital Economy. An introduction to the concepts of electronic commerce as facilitated by the Internet, World Wide Web, and related technologies. The topics covered include: an understanding of e-commerce business-to-business (B2B), business-to-customer (B2C), business-to-government (B2G), information analysis, requirement determination, detailed logical design, physical design, implementation planning, development of business strategies for using e-commerce within an organisation.

(b) Managing through leadership in the E-environment. An overview of the principles of electronic commerce from the business perspective. The origin and growth of E-commerce; differences and similarities between E-commerce and traditional commerce. Relationship of E-commerce to the Internet. Project management (PERT, Gantt) procurement cycle, SLAs, RFP, project contract structures, negotiating skills, collaborative team participation in decision making.

(c) Fundamentals of International Marketing. This course provides an introduction to the field of international marketing with its focus on reviewing the important strategic advantages that flow to firms who learn how to compete globally and to present an integrative framework for developing global marketing strategy through analysing situations that marketing managers encounter both local and global in promoting growth and recognising opportunities. The course emphasises international marketing principles, forces, analysis and strategising. Topics include marketing management, buyer behaviour, product policy, pricing, distribution, advertising and promotion and competitive strategy.

(d) User Interface Design for the Web. HTML authoring; overview of VRML, XML, SGML, CGI; page composition tools; server technology and server-side processing; active pages: ActiveX, JavaScript, applet usage; browser technology, engineering a quality website; usability issues; site and server management

(e) E-Commerce Technologies. Communications technology and infrastructure; Internet protocols; intranets, extranets and agents; web server architecture, hardware, software and tools; mobile commu-

nications and telephony; distributed systems technologies; sockets; multimedia technology overview; security issues: firewalls, encryption, authentication, standards; emergent and future.

(f) Local and Global Regulatory Systems. The legal and policy environment of E-commerce. Legal concepts and functioning of the courts. Intellectual property, digital copyright, advertising and consumer protection. Commercial transactions and the enforceability of electronic agreements, financial services and securities regulation, taxation, antitrust, criminal law, international law and ethics.

(g) Supply Chain Management. Management of raw materials and finished inventory to maximise return on investment. The interrelationship of obtaining materials, working on and storing them internally, and delivering them to their final destination in the face of uncertainty, changing prices and varying demands. Inventory and reorder policies. Order fulfillment. Dealing with peak and slack demands.

(h) Security Issues when doing Business On-line. While not trying to turn the analyst into an Internet security specialist, the graduate must be able to suggest security methods that will provide overall security of the clients system to make it less vulnerable from intrusions and unauthorised access. Topics will include methods for evaluating security risks, security practices that are cost effective, third party agreements and an education program for all staff members as security is the responsibility of all employees.

(i) Business Law and Ethics. As the Governments come to terms with the changing nature of Internet commerce, they develop a raft of laws and regulations for the protection of the consumer, privacy of data, digital copyright, taxation of goods and services, and contractual law to support contracts entered into where digital agreements are replacing paper based physical contracts.

CONCLUSION

As the online community becomes more sophisticated in accessing and using the Internet for Business-to-Business (B2B), Business-to-Consumer (B2C), Consumer-to-Consumer (C2C) and Business-to-Government (B2G) commerce, together with Federal government policies aimed at encouraging more online business activity, the skill sets for the e-business analyst working with the SME requires a balanced mix of e-business analysis and e-commerce technical skills combined with leadership skills aimed at empowering the SME to take on a higher degree of responsibility for the development of their e-business strategic plan, implementation and update. Since the SME has a limited time and budget, they are more likely to engage a local consultant, one they can trust and build a relationship who has the skill sets to analyse, design, develop, implement and test an e-business strategy. To equip the graduate, specific courses/subjects/programs need to be developed that enable the e-business analyst/programmer/developer to acquire these skills so they can provide the level of service that will encourage a higher level of adoption and diffusion and acceptance by the SME.

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