

Electronic Commerce: The End of the Beginning

13th International Bled Electronic Commerce Conference

Bled, Slovenia, June 19-21, 2000

Electronic Commerce Careers: a Preliminary Survey of the Online Marketplace

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Abstract

Electronic Commerce (E-Commerce or, increasingly, E-Business) has shown dramatic growth since the commercialisation of the Internet and the creation of the World Wide Web in the early to mid 1990's. Only a few years ago not many universities offered E-Commerce subjects – either as undergraduate/post-graduate degrees or even in the form of single subjects. But over the past four years, as E-Commerce continues to gain popularity in the market-place, many universities have started to offer E-Commerce degrees at both undergraduate and masters levels. This raises the issue of what sort of jobs an E-Commerce graduate can expect to find. Naturally, young graduates trained in this field will be anticipating interesting, dynamic, challenging and well-paid careers but, until recently, most "E-Commerce" positions have tended to be re-badged IT jobs. This paper provides an analysis of the E-Commerce/E-Business jobs market-place – offering graduates an opportunity to understand what they can realistically expect to find waiting for them. Data were gathered from the web sites of online recruiters and, given the preliminary nature of this paper, analysed descriptively to provide a snapshot of the current E-Commerce job scene and to see how an E-Commerce/E-Business career compares with the "traditional" Information Technology jobs market.

1. Introduction

Following the commercialisation of the Internet in 1991 and the development of the World Wide Web graphical interfaces Mosaic and Netscape during 1992-93, the then fairly limited range of Electronic Commerce activities developed rapidly and spread to virtually all sectors of society. The universal and user-friendly WWW user interface lured software developers and venture capitalists alike into Internet-based E-Commerce, where they discovered ever-increasing numbers of ways to transact business electronically. Although the amazing expansion of Internet stocks we see today did not really begin until 1998, businesses have been going online with increasing frequency since the mid-1990s.

This escalation of commercial E-Commerce activities has been paralleled by an almost equally impressive rise in the number of university degrees/courses in E-Commerce/E-Business, as industry begins to demand graduates with E-Commerce experience (IBM alone refers to a need for 2,000-3,000 E-Commerce graduates each year). Over the past two years, many universities have hurriedly put together E-Commerce degrees (ISWorld, 2000; Davis *et al.* 1999; Chan, 2000) to meet the demand for trained professionals in this field.

Given the apparent demand for students with E-Commerce qualifications, a question arises concerning the sorts of jobs an E-Commerce graduate can expect to find waiting. According to a survey carried out by Computerworld (Goff, 2000) in the second half of 1999, there was a general perception by IT managers of a significant need for E-Commerce graduates. Yelland (1999) reported in the same year that there was still a significant shortage of IT skills. Waikato Management School (1999), Davis *et al.* (1999:87) and Fafard (1999) have all provided further examples of jobs in the Electronic Commerce field and E-Commerce-related academic positions are starting to be posted on the ISWorld academic listserver (ISWorld, 2000a,b). Yet, in contrast to these perceptions of significant demand, some graduates have expressed the view that they could not find a job in Electronic Commerce (JobAsia Forum 1999). Do circumstances differ from one part of the world to another – or is it lack of information which makes graduates unaware of the opportunities available to them?

A study of Information Systems graduates by Castleman and Coulthard (1999) found that IS graduates do not appear to have clear, realistic expectations of what the professional workplace holds in store. We think it highly probable that E-Commerce graduates are also unrealistic in their expectations of future employment possibilities – or possibly simply unaware that of the type and variety of opportunities in the workplace. It is also possible that the jobs advertised as being “E-Commerce related” are really IT jobs with “sexy” titles, which may not reflect the true picture of the E-Commerce job market.

Clearly, there is a need for some accurate data on what is available now and what graduates with E-Commerce experience can and should be anticipating in terms of career opportunities. This paper explores and identifies the Electronic Commerce job market, on the basis of the advertisements actually placed by on-line recruiters, offering a realistic picture of what is available today in this field. We then attempt to predict the nature of the jobs which may be available for graduates in some aspect of Electronic Commerce over the years to come.

2. Methodology

Since little (if any) research has been undertaken into the nature and availability of E-Commerce employment opportunities, this paper forms an exploratory study of what is still very much a new field. Sekaran (1992) points out that exploratory studies are undertaken: “*when we do not know much about the situation at hand, or when we have no information on how similar problems or*

research issues have been solved in the past ... when the data reveal some pattern regarding the phenomena of interest, theories are developed and hypotheses formulated” (Sekaran, 1992: 95). In view of the lack of information available in the academic press, we decided that the only effective way to understand the issue of E-Commerce career opportunities was to gather raw data from the recruiters themselves and undertake a preliminary analysis – which could form the basis for a longer-term qualitative analysis of the prospective employers and the evolving jobs market.

The paper is therefore based on an analysis of online job advertisements, which were subjected to descriptive statistical analysis only. The data collected for this paper were obtained from on-line recruitment sites during the period from May, 1999 to January, 2000. Appendix 1 contains the URLs of the on-line recruitment sites visited to obtain the data. Since E-Commerce is still not a category on the recruitment web pages, we chose the “IT and Computers” job category, and undertook key-word searches using the terms “E-Commerce”, “E-Business”, or “Electronic Commerce”.

One of the most interesting aspects of E-Commerce/E-Business is its creation of an array of business and technical jobs which did not previously exist:

- CYBER Management Inc. (1996), for example, identified 125 new Internet job titles in 1996;
- Coles and Sommers (1997) cited eight jobs in the E-Commerce area, all of which were concerned with technology and the Internet. They included: systems architect, network infrastructure support, project managers, web site developers, content author/publisher, resident artist/photographer/post production editor, webmaster and technical support/help desk.
- In 1998, the Australian Computer Society (1998) divided the careers in Information Technology into 6 major categories: Software Development, Business Analysis, Systems Analysis, Computer Engineering, Sales and Marketing, and Multimedia Development;
- In 1999, Computerworld identified the “most wanted” skills for IT professionals by means of a survey of 493 IT hiring managers (Computerworld Inc., 1999).

Most of the job titles mentioned in the articles identified above, however, refer to “conventional” IT, rather than to E-Commerce/E-Business. Since the scope of E-Commerce is very wide, different people have differing interpretations of the meaning of the terms “Electronic Commerce”, “E-Commerce”, and “E-Business”. Mougayar (1998) stated that people misused, abused and confused the term “E-Commerce” and that 94% of E-Commerce News is actually insignificant (CYBER Management Inc., 1998). Before we discuss the possible careers available to E-Commerce graduates, we need a definition on which we can base our analysis. In earlier work (Chan and Swatman, 1999) we provided the following definition:

Electronic Commerce involves the undertaking of normal commercial, government, or personal activities by means of computers and telecommunications networks; and includes a wide variety of actions involving the exchange of information, data or value-based exchanges between two or more parties.

This definition is very much in line with the general view in Europe (see, for example, European Commission, 1999), although in the United States a division is appearing between the terms E-Commerce and E-Business. The recent report by the US Census Bureau on “Measuring Electronic Business Definitions: Underlying Concepts and Measurement Plans” (Mesenbourg, 1999) differentiates the two terms as follows:

Electronic business (e-business) is any process that a business organization conducts over a computer-mediated network. Business organizations include any for-profit, governmental, or

nonprofit entity. Their processes include production-, customer-, and internal or management-focused business processes.

This definition suggests that E-Business is the super-set of electronic business activity, and that E-Commerce forms a subset of this wider group:

Electronic commerce (e-commerce) is any transaction completed over a computer-mediated network that involves the transfer of ownership or rights to use goods or services. Transactions occur within selected e-business processes (e.g., selling process) and are “completed” when agreement is reached between the buyer and seller to transfer the ownership or rights to use goods or services. Completed transactions may have a zero price (e.g., a free software download).

Given this emerging schism in terminology, the only effective solution in terms of coverage appeared to be to make use of all three terms in searching for job advertisements.

3. Major categories of Careers and Skills in E-Commerce/E-Business

The development of taxonomic E-Commerce models is still in its infancy, although Chan and Swatman (1999) have produced an illustrative framework (the Electronic Commerce Component Model, or ECCM) which provides a reasonably complete picture of the structure and activities of this field.

Table 1 below is drawn from the ECCM – Column 1 contains the “meta-views” of the model, while Column 2 identifies the objects which might be contained within each component of the meta-view. The third column has been added to the table for this paper to list the major categories of careers in Electronic Commerce.

Meta-view level Components	Objects within each component	Careers in E-Commerce Categories
Infrastructure (Technical)	Telecommunications / Network technologies (wireless / wire transmission) Multimedia applications Internet / intranet/ extranet Web page development (html, java, perl) Web page browser (Netscape, IE, lynx) Simulation Data mining/warehousing Security of Information EDI Database management Client/server, web server maintenance Internet Service Provider Human Computer Interface Smart card devices	Web Development and Programming E-Commerce Systems and Solutions

Meta-view level Components	Objects within each component	Careers in E-Commerce Categories
Services	Internet Payment Systems (EFTPOS, EFT) e-publishing Procurement (e-catalogues) Types of services (business-to-business, customer-to-business, intra-business) Information kiosks (library, airline, weather forecast) On-line Shopping On-line Education Other Internet Commerce activities	Business Analysis Sales and Consultancy Management and Strategic Planning Education and Training Research
Legal	Government policy Government regulation Privacy Intellectual Property / Copyright Contractual and Legal Settlements Ethics / Computer Crime	Lawyer and Legislator/ Policy-maker

Table 1. Potential E-Commerce Career Types

(adapted from Chan and Swatman, 1999)

We have divided E-Commerce/E-Business careers into 8 categories, although the rapid rate of change of both technology and society may well require modification of these categories within a fairly short space of time. The categories we have identified from the recruitment web sites are therefore merely designed to provide a first-cut taxonomy which can be used by E-Commerce graduates in their search for relevant and rewarding employment (and which will form the basis for further research into this swiftly changing area).

Category I – Web Development and Programming

The most obvious group of jobs created by the occurrence of Internet-based E-Commerce is those positions which relate to the development and maintenance of WWW sites. In general, this category contains positions which involve the construction of web pages using a variety of programming languages. Starting with the entry-level position of E-Commerce web programmer which usually requires one year’s work experience, jobs in this category range through to the position Web Director, which requires about 8 years’ relevant post-graduate experience. Other positions in this group include: Applications Software Developer – responsible for developing multi-media e-commerce solutions; and E-Commerce Developers – who are responsible for developing Internet E-Commerce products. A more complete list includes the following position titles:

Job Titles:

Analyst Programmer - Cold Fusion	Applications Software Developer	Applications Development Manager
ASP Programmer	C++ Programmer	Developer in Internet
Developer in Java	E-Commerce Developer	Electronic Commerce Web Developer
HTML Developer	Lead Web Designer	OO developer
Perl Programmer	Progress Programmer	Senior Analyst Programmer
Software Developer	Software Engineers	Technical Web Team Leader
Visual Basic Programmer	Web Consultant	Web Director
Web Engineer	Web Programmers	Web Specialist

Qualifications:

- Degree in Computer Science, Engineering or related field.
- One to eight years of post-graduate experience.

Key Selection Criteria:

- Experience, skill and knowledge of one or more of the following: ASP, C++, CGI, CICS, Cold Fusion, COM, Corba, ADO/OLE, DCOM, DHTML, Dreamweaver, EJB, Flash, Generator, Mediasurface, MS Access, HTML, HTTP, Informix, InterDev, Java, Javascript, Lotus Notes, OLTP, Perl, PowerBuilder, RATIONAL ROSE, TCP/IP, Visual Basic, Visual Fox Pro, XML, XSL.
- Experience in the Internet design industry.

Specific Accountabilities:

- Manage a team of web professionals to develop and maintain the company's web site.
- Develop and /or manage external consultants to develop applications on the web to implement the company's business vision.
- Design; develop and support WEB sites and assist with integration testing and user acceptance testing.

Category II - E-Commerce Systems and Solutions

This category relates to more conventional IT roles in areas such as computer systems / servers and networking – but the work is related to the systems which back up E-Commerce/E-Business applications and therefore require E-Commerce technical skills in addition to IT skills. Experience in different types of systems, especially Windows NT and Oracle, is usually required for these positions. As with Category I, jobs in this group range from introductory to technical management level.

Job Titles:

C++/Unix Analyst	Database Analyst - SQL Server - Internet	E-Commerce Architect
E-Commerce Development Manager	E-Commerce Network Administrator	E-Commerce Specialist

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E-Commerce Systems Architect	E-Commerce Systems Technical Leader	E-Commerce Technical Architect
Internet Systems Designer	Java Database Developer	Oracle DBA
Oracle Project Manager	Professional Services Manager	Project Director
Project Manager	Security services/ Risk Management Lead Consultant	Senior Developer
System Analysis	System Tester - Internet	Systems Administrator
Systems Architect - Internet Development	Systems Engineer	Team Leader
Technical Development Manager	Technical Specialist	Technical Support Manager
Unix Systems Administrator	Web Database Developer	Web Site Coordinator

Qualifications:

- Degree in Computer Science, Engineering or a related field.
- One to five years of post-graduate experience.

Key Selection Criteria:

- Experience in managing Linux, Microsoft NT server, Active Server Pages, SAP, MS SQL Server, Transaction Server, Informix, Sybase, Oracle, QMS, Solaris macromedia product knowledge and Apache.
- A sound understanding of security issues and security tools around the Internet and UNIX based platforms.
- Ideally a Microsoft Certified Professional.

Specific Accountabilities:

- Design, develop and implement world-class Internet, Extranet and Intranet E-Commerce solutions.
- Work with the different business groups and use a broad skill set to deliver effective web solutions.
- Understand client requirements, develop E-Commerce architecture, provide input to proposals and manage the delivery team.

Category III – Business Analysis

Business Analysts assist in providing more detailed project objectives, systems requirements, business process analysis and cost-benefit analysis. Although Business Analyst is a relatively common role in the IT industry generally, knowledge of E-Commerce solutions and business is essential for this category of E-Commerce positions.

Job Titles:

Business Analyst/ Business Systems Analyst	Business Development Manager	Business Solutions Manager
E-Commerce Business Analyst	E-Commerce Product Manager	Junior Business Analyst E-Commerce Designer

Qualifications:

- Professional qualifications will vary but a good understanding of IT and E-Commerce is essential.
- Degree in Business and Management Information Systems is preferable.

Key Selection Criteria:

- Possess experience in system development, ideally in a client server or web based environment coupled with a quality and customer focused approach.

Specific Accountabilities:

- The key driver of ascertaining business needs and providing electronic commerce system solutions.
- Provide the technical leadership in relation to the potential application of e-commerce and revised business practices to improve the efficiency of products in their business units.
- Review/analyse and support systems/solutions to satisfy user requirements.

Category IV - Sales and Consultancy

This category is one in which the most rapid growth has been seen since the start of 1999. Jobs offered in this category tend to relate marketing and sales – and can be found in any industry sector where E-Commerce is relevant (essentially, this means all industry sectors). Obviously a less technical background is required here – but knowledge of E-Commerce products and good communication skills are essential.

Job Titles:

Business Manager – Corporate Accounts	Buying Manager	Call Centre Specialist
Chief Content Editor	Consultant	E-Business Development Manager
E-Business Security Consultant	E-Business Security Consulting Manager	E-Commerce/ Internet Specialist
E-Commerce Account Manager	E-Commerce Business Development Manager	E-Commerce Sales
Electronic Commerce Consultant	Engagement Manager	ERP/CRM Consultant
ERP/Professional Services Consultants	Exceptional IT Consultants	Internet Sales Executive
Marketing and Business Development Director	Marketing Manager	Public Relations Consultant
Recruitment Consultant	Sales Account Manager	Sales Director
Sales Executive	Sales Manager	Senior Sales Executive

Qualifications:

- Diploma or Degree is preferred – not necessarily in any particular field.

Key Selection Criteria:

- Background in programming, systems, advertising, agency, media or Internet, E-Commerce, software sales is preferred.

Specific Accountabilities:

- Involves in identifying and qualifying of electronic business opportunities and determining customer requirements relating to this type of solutions.

Category V – Management and Strategic Planning

As the E-Commerce/E-Business area continues to grow – and more and more companies are either fully or partially online-based, senior management roles are beginning to develop for graduates with expertise in this field. Positions in this category offer very high salary packages (usually combining an annual salary of A\$200K or more, together with stock options and other perqs) and applicants are expected to have both technical and managerial expertise.

Job Titles:

Business Manager – Planning	Business Manager Communications	Credit Manager
E-Commerce Business Strategist	E-Commerce Executive Manager	General Manager - E-Commerce
National Business Strategist	Senior Manager	Vice President – E-Commerce

Qualifications:

- At present, most advertisements which specify qualifications tend to ask for an MBA – but this is slowly changing as more E-Commerce graduate degrees become available.

Key Selection Criteria:

- Senior management experience.
- Team building and team leadership skills and experience.
- Strong commercial and planning skills.

Specific Accountabilities:

- Put in place a 5-year business plan.
- Manage a regional E-Commerce operation.
- Undertake strategic, proactive business development.

The final 3 categories are not yet found in online recruitment advertisements (although they can be found individually, particularly those from the educational group). We predict, however, that they will emerge very shortly and will become increasingly important.

Category VI – Education and Training

An E-Commerce trainer is responsible for providing training to partners and to all other staff in the company. The other positions in this category are more related to teaching jobs in tertiary institutions.

Job Titles:

E-Commerce/E-Business Trainer
Teacher in E-Commerce/E-Business
Training Manager

Lecturer in E-Commerce/E-Business

Professor / Assoc. Professor of E-Commerce/E-Business

Qualifications:

- A Higher degree is essential and teaching experience is preferable.

Key Selection Criteria:

- Knowledge of and experience in E-Commerce/E-Business.

Specific Accountabilities:

- Conduct lectures and tutorials.
- Carry out research in the E-Commerce/E-Business arena.

Category VII - Research

22 key research issues were identified at the 11th International Bled Electronic Commerce Conference (Vogel, 1998). We believe that a great deal of research is currently on-going, or is in its early, formative stages. These research projects will be carried out mainly in universities and with affiliated industry partners. The research carried out in universities will tend to emphasise theories and models, while that carried out in industry will be more related to the specific industry sector in which it takes place – for example: travel, banking or insurance.

Job Titles:

E-Commerce Postdoctoral Research Fellow in academe
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E-Commerce Postdoctoral Research Fellow in industry

Qualifications:

- A PhD degree is essential.

Key Selection Criteria:

- A sound research track record.

Specific Accountabilities:

- Conduct research in the E-Commerce arena.

Category VIII Lawyers and Legislators/Policy-makers

Legal professionals is required to establish the law and draw up government policy for Electronic Commerce. Areas of interest will include criminal law (including new types of fraud, money laundering using the Internet, and the already well-known problems of electronic break-ins, such as hacking); intellectual property in all its manifestations; the evolving meanings of contractual agreement in the electronic world; changing industrial legislation, as E-Commerce remakes the workplace; jurisdictional issues of all sorts; and the vexed questions of privacy and freedom of information, in a world where pornography and terrorist information are readily available to all. These topics, while broad enough in themselves, do not begin to cover the range of policy and legal issues which have already arisen – and there is little doubt that new legal minefields will become apparent as the power and range of the Internet continues to grow. The graduates who apply for the new roles we have touched on above will not necessarily have expert technical knowledge (hardware, software and systems), but will certainly need to possess a thorough grounding in E-Commerce/E-Business concepts and issues.

Job Titles:

E-Commerce parliamentary draftsman/woman
E-Commerce policy planner
E-Commerce solicitor/barrister/attorney

Qualifications:

- A law degree with experience in policy making.

Key Selection Criteria:

- Knowledge of and Experience in legal and E-Commerce issues.

Specific Accountabilities:

- Assist the government in establishing the laws, regulations and policy on E-Commerce.
- Consult and advise clients on E-Commerce legal issues.
- Represent clients in court on E-Commerce cases.

In addition to the specific requirements for individual positions, many of the online advertisements use more general, common descriptive words for recruitment of E-Commerce professionals. E-Commerce staff members are frequently expected to be:

motivated; well-organised; technically confident and resourceful; able to learn new skills in a short time; energetic; entrepreneurial; dynamic and driven; autonomous; proactive; possessing good oral, written, communication and presentation skills; able to work well in a team but also to work independently; possess good analytical, teaching or special skills (such as seeking third-party materials, reading, digesting, rewriting and editing); able to work overtime when the project demands it.

Finally, the most important criterion of all – E-Commerce staff must know the technology well enough to realise what it can and cannot do.

4. E-Commerce Advertising – a New Language Evolves

Increasingly, specialist terms are appearing in the advertisement of the on-line E-Commerce/E-Business recruiters. The most frequently appearing terms include:

B2B, B2C, E-Business, E-Commerce Company, E-Commerce SDLC, E-Commerce Solutions, E-Commerce Strategy, E-Commerce transaction, E-Commerce related technology, EDI, supply chain management and virtual communities.

Recruitment consultants, of course, merely mirror the world they seek to represent – the appearance of these terms is thus a further indication of the increasing popularity and currency of Electronic Commerce. The fact that these terms are not explained in the advertisements also suggests that E-Commerce is becoming more “mainstream” and ceasing to be seen as a specialist field.

Once E-Commerce becomes a standard category in online recruitment web sites, we will know that this field has finally become a part of the everyday world.

5. E-Commerce vs. Information Technology

Since this level of acceptance has not yet been reached, the positions listed in this paper had to be found by searching under other categories. At present, the most fruitful categories on the recruitment web sites are the “IT and Computers” and “Sales and Marketing” categories, with E-Commerce/E-Business as the key words for the search. This approach, of course, means that the kinds of jobs we found are primarily those related to IT or sales professionals.

- For Category I and II in particular, the nature of the jobs is similar to those found in the more general IT group – although E-Commerce skills and knowledge are specifically required by the advertisements for the jobs we identified.
- Category III, IV and V are more business oriented. But the additional knowledge / skills, such as business process reengineering, B2B and B2C concepts, the supply chain model, EDI, ability to implement business concepts on the web, are unique to E-Commerce professionals and not normally required of IT professionals.
- Jobs in Category VI to VIII are not yet found in the web recruiter advertisements, although jobs in Categories VI and VII are appearing with increasing frequency on the ISWorld academic listserver. Category VI (Education and Training) relates to education professionals who have specialised in E-Commerce. Professionals with research skills and/or legal knowledge are required in Categories VII and VIII.

What, then, are the differences between “conventional” IT jobs and those IT-oriented positions which include the “E-Commerce” keyword? Clearly, there is a considerable overlap in terms of the technical proficiencies required for many of the positions listed, although some of the programming languages and specialist tools are specifically designed for web site creation and management. The business skills required of the two groups do appear to differ – and there is no doubt that there are more diverse and more senior positions available in the E-Commerce/E-Business world than there are in the traditional IT jobs market. While E-Commerce certainly makes use of IT for its deployment, the path appears to be one where IT is increasingly becoming a subset of E-Commerce – rather than the other way around.

In the sales and marketing area, the similarities between traditional and E-Business job opportunities may, at first sight, appear even greater – but a more detailed examination of the advertisements shows that a thorough understanding of E-Commerce/E-Business and experience in these areas is a pre-requisite for all the more senior positions.

If we try to identify what makes the role of “E-Commerce Professional” unique, we can see that such a position has three aspects: **Electronics**, **Commerce/Business** and **People**. These aspects are both inter-related and inter-dependent:

- The term **Electronics** refers to the electronic technologies which support the applications or roles, eg. software, computer systems, etc.
- The term **Commerce/Business** refers to the business processes and marketing techniques which make the electronic technologies relevant to the real world; and
- The term **People** relates to the degree of adoption of Electronic Commerce by People.

Technology has enabled significant and sweeping changes in business processes – particularly in the service industries, where concepts such as dis-intermediation and re-intermediation are increasingly apparent. The E-Commerce environment is so competitive and innovative that concepts and projects are constantly being modified to keep up with market requirements. And yet, despite the unquestioned importance of the technology, marketing is the main driving force for nearly all E-Commerce efforts and initiatives – thus the Commerce/Business aspects “push” the Electronics aspects.

Finally, if people do not accept E-Commerce – whether because they doubt the security of the networks which provide their services, or whether because they are not yet ready to gain familiarity with the new technology – all the effort which has been put into the technology and business processes cannot take E-Commerce any further. Ultimately, it is the People aspect of the concept which will make or break E-Commerce/E-Business in the real world. And yet, simplified business processes and exciting technology make people want to participate in the E-Business world – so that all three aspects of the model are necessary for effective E-Commerce/E-Business development and uptake.

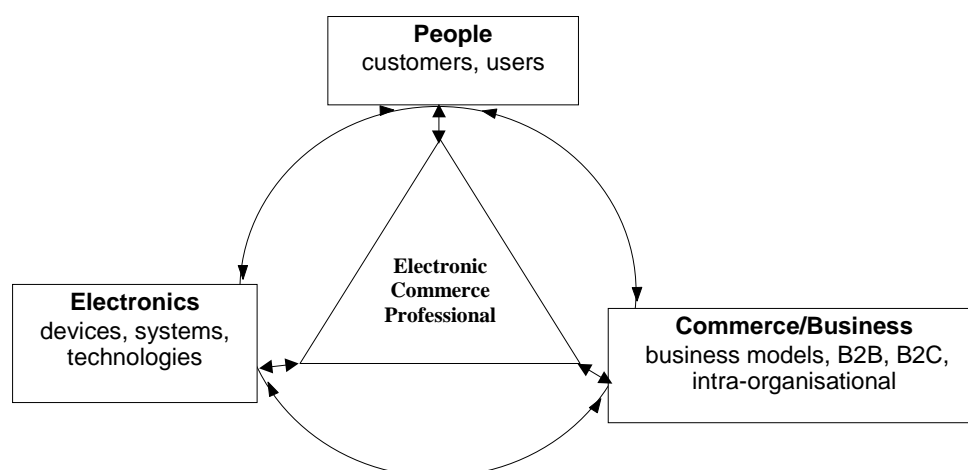


Figure 1: the Inter-related Role of E-Commerce Professional

Figure 1 illustrates the three aspects of the E-Commerce/E-Business Professional, and shows how the technical/business/social components interact. The need for people who can balance these three quite different areas of competence will only increase over time – with the result that E-Commerce professionals are in increasing demand in the market-place. More E-Commerce professionals, consequently, will 'push' E-Commerce more quickly.

6. Conclusion

This is still early days for the Information Revolution, but graduates who can point to a significant understanding of E-Commerce computer/networking technology, or who can show that they have completed a number of subjects in the area of E-Marketing, are in very great demand at present. Major consulting companies, large hardware and software manufacturers, web site developers and Internet companies of all sorts are eagerly seeking graduates in Information Systems/MIS, Computer Science, Marketing and Multimedia who have completed an E-Commerce major or even minor stream.

This growth in jobs is likely to expand over time. The Australian Department of Foreign Affairs and Trade, in its three *New Silk Road* publications (DFAT, 1999) pointed out that the Internet is spreading around the globe in four waves – starting from the first wave in the USA / Canada to the fourth wave in the least developed countries. In the first wave countries, E-Commerce jobs are readily available, as E-Business start-ups grow rapidly and have a voracious appetite for bright young graduates. Australia and Asia, in the second wave, are just beginning to demand E-Commerce/E-Business graduates – specialised jobs are not yet available in the variety which is offered in North America. But, as a review of the online recruiters over the past 9 months shows, this section of the jobs market is expanding at an ever-increasing rate.

One impediment to rapid take-off in this area of the recruitment field is the lack of “E-Commerce” or “E-Business” as a category in the on-line recruitment web sites. It is still necessary to search under the IT or Sales & Marketing categories, using the key-words E-Commerce/Electronic Commerce/E-Business – which suggests to the would-be employees that this area is still a subset of the IT or Sales career ladder. This will certainly change over time – and one pointer to the maturity of the E-Commerce market-place will be the emergence of recruitment categories for E-Commerce/E-Business.

Research in the area of E-Commerce/E-Business careers is still very new – and little has yet been gathered in terms of “hard” empirical data. We see the fairly superficial data reported here as the initial step in developing a significant research project into the growth and development of the E-Commerce jobs market. While this research does not yet offer significant insights in theoretical terms, we believe that it has significant implications for both corporate HR and line management executives – who will be able to use these findings to align job advertisements more effectively with the requirements of the positions available; and graduates – who will be able to ensure that they both tailor their studies to the opportunities available, as well as gaining the maximum advantage from their existing skills and qualifications.

Our present, web-based survey will be followed by several pieces of further research, building into a solid overview of the E-Commerce careers industry:

- A follow-up survey of online recruiters will be undertaken in 12-18 months’ time, which will provide a longitudinal baseline for analysis of growth in job opportunities. Items such as average age, experience required for the various jobs, salary range, and the volatility of job titles will also be included in the survey, to provide a richer understanding of this brave new world. We hope at that time, in addition, to be able to extend our current set of 8 job categories to include the new roles which are developing at this very moment;
- A more rigorous empirical study will involve interviews with prospective employers, in a bid to identify requirements and expectations for graduate career growth in Electronic Commerce. This face-to-face survey will complement the online survey by providing greater depth (although considerably less breadth) and will enable us to gain a richer picture of the job market. In these interviews we will also be able to enhance our understanding of more complex issues, such as experience and maturity required for the various positions; and possible correlation between job title and readiness to change employers.

This is an exciting time to be studying the E-Commerce employment market. While the field is still in its infancy, change is rapid and on-going and surprises are common. Over the next few years the E-Commerce recruitment market will stabilise and slowly conform to the pattern seen in other industries – where graduates have a clear picture of the jobs available and know, more or less, how easy it will be to find employment in their desired field. Just at present in the E-Commerce / E-Business area there is no such certainty. Graduates and researchers alike must guess where the next growth spurt will come from and survey data will continue to be out-of-date within a matter of weeks for at least the next few years.

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Appendix 1

Data Sources for the Online E-Commerce Careers Survey [Accessed April 24, 2000].

Recruitment Agencies	URL
Andersen Consulting	http://www.andersen.com/
Australian Job Search	http://www.jobsearch.gov.au/
Best People International Pty Ltd	http://www.bestpeople.com.au/
Candle IT&T Recruitment	http://www.candlerecruit.com/
CareerOne Pty. Ltd.	http://www.careerone.com.au/
Clements Human Resource Consultants	http://www.clements.com.au/main.html
Clifton & Associates	http://www.cliftons.com.au/
Data Personnel	http://www.hkstar.com/~dpdp/maincontent.htm
DMA	http://www.dma.com.au/
Drake Information Technology Group	http://www.briandrake.com/drake2.htm
Employment Opportunities in Australia	http://www.employment.com.au/
Ernst & Young Australia	http://www.ey.com.au/
Harper IT Executive	http://www.harperit.au.com/
Hays I.T. Personnel	http://www.hays.com.au/sbu/sbu4.asp
HiTech	http://www.hitechaust.com/
Hugh Francis Consulting	http://www.hughfrancis.com.au/frame.htm
ICON Job Centre	http://www.iconrec.com.au/sw/index_jobsrch.html
Index Technology Recruiters Pty Ltd	http://www.index.com.au/
Information Systems Employment Services	http://www.ises.com.au/
InfoTech Services (Hong Kong) Limited	http://www.infotech.com.hk/index.htm
Interim Technology	http://www.interimtechnology.com.au/
IntoTech Recruitment	http://www.intotech.com.au/
IT Career International	http://www.itcareer.com/
Job Access Limited	http://www.jobaccess.com/
JOBNET WorldWide Pty Ltd	http://jobsearch.jobnet.com.au/
Jobnet.com	http://www.jobnet.com/
Jobsite	http://jobsite.co.uk/
Jobworx	http://www.jobworx.com.au/
John Fairfax Holdings Ltd.	http://itjobs.fairfax.com.au/
Mantech IT Recruitment	http://www.mantechIT.com.au

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Recruitment Agencies	URL
Michael Page International	http://www.michaelpage.com.au
Microsource Consulting	http://www.microsource.com.au/
Monster.com	http://jobsearch.monster.com
Morgan & Banks Limited	http://www.morganbanks.com.au/
MYJOB Co. Ltd.	http://www.myjob.com.hk/search.shtml
Oriental Tech Executive Search Consultants	http://www.oriental-tech.com/
Parkside Consulting	http://www.parkside.com.au/main.htm
Paxus People	http://www.paxus.com.au/
Peoplebank	http://www.peoplebank.com.au/
Plexus	http://www.plexus.co.uk/
Protocol Consulting	http://www.protocolconsulting.com.au/
Skillsearch Computing	http://www.skillsearch.com.au/
TechPartners International	http://www.techpartners.com