Chapter 4

Electronic Commerce Component Model

“The value of an idea lies in the using of it.”

~ Thomas A. Edison ~

The main theme of this research project is to investigate the offering of tertiary EC/EB educational programs. In Section 1.1.1, I provided a brief introduction to the background and development of the Internet and EC, but without linking this to EC/EB education in any detail. To enable a full overview/understanding of tertiary EC/EB educational programs, I now focus on the true nature of EC/EB. In this Chapter, therefore, my discussions emphasise the structures and components of EC/EB.

Firstly, I briefly describe the history of EB and then define EC and EB, discussing the differences between these two concepts. I then summarise the currently available models relating to the structure or content of EC and EB. Finally, I define a model of the components of EC/EB. This model is used as a foundation to understand the major categories of the individual EC/EB courses which contribute to tertiary EC/EB educational programs to be analysed in Section 6.1.2.2. The model also plays a role in helping to identify the categories of EC careers, which will be covered in Section 7.1.

It is important to note that the objective of this Chapter is to provide a brief description of the way in which how EB has emerged and of its components, rather than to dig deeply into the technology, processes and legal issues of EC/EB.

4.1 The Road from Electronic Data Interchange to Electronic Business

Traditional EC, conducted by means of the information technologies involving Electronic Data Interchange (EDI) over proprietary value-added networks, is rapidly moving to a more transactional medium using the Internet (Zwass 1996). In this Section, I briefly describe the history of EB, touching on the phases of EDI, EC and EB.
4.1.1 Electronic Data Interchange phase

The origins of EB can be traced back to EDI, which itself dates back to a concept developed in 1948. During the Berlin Airlift, the then Master Sergeant Ed Guilbert was responsible for coordinating the consignments of food and goods delivered by the air forces of many nations. The standard consignment document he invented to simplify this process was the inspiration for the concept of standardised business documents and, ultimately, for EDI as we know it today. Working for the TDCC during the 1960s, Guilbert used his original idea as a foundation for the first transport industry interchange documents and the concept was adopted by industry groups across the US. In 1979, ANSI developed uniform standards for cross-industry electronic communications and EDI standards were further developed and improved. Similar and parallel development in the UK (and later Europe) under the name Trade Data Interchange (TDI) culminated in 1985 in the development of a set of universal EDI standards known as EDIFACT (EDI for Administration, Commerce and Transport), which formed a bridge between the existing US ANSI X12 and the European UN/GTDI standards (Swatman 1996).

One of the earliest descriptions of EDI is found in Brawn (1989).

The essential elements of EDI are:

- **direct application-to-application** (not merely computer-to-computer) communication;
- the use of an electronic transmission medium (normally a value-added network) rather than magnetic tapes, disks, or other transmission media;
- the use of electronic mail boxes for "store and collect/store and forward" transmission/delivery of documents;
- the use of structured, formatted messages based upon internationally agreed standards (thus enabling messages to be translated, interpreted and checked for compliance to a standard set of rules).

The term EDI therefore does **not** refer to:

- electronic mail (which must be read by the recipient and which does not make use of standardised document formats);
- file transfer (which also makes little use of standardised formats and which need no connection with applications at either end of the transmission); or
- remote data entry (which merely places the entry terminal some distance away from the computer).

The EDI era was primarily of benefit to large companies, which could afford the expensive and specialised hardware and software necessary to take full advantage of
the inter-company linkages, and internal system/structure integration EDI made possible. Smaller companies (particularly SMEs) found EDI less useful and many adopted the innovation simply because of pressure from their largest customers (Swatman 1993). The opening up of the Internet to commercial use, together with the availability of the World Wide Web, which both occurred in 1993, made it possible for companies to consider alternative methods of exchanging business documents and information.

Large organisations such as BHP Steel\textsuperscript{34} in Australia (Chan C. & Swatman 1999), the retail and apparel industries, and the automotive and construction industries (to name just a few) are still significant users of EDI. All the major integrated supply chain initiatives, such as Just-in-Time, Quick Response and Efficient Consumer Response depend on EDI for their communications and it is unlikely that major industry groups which have invested significant amounts of money in establishing EDI systems will replace these legacy systems in the near future. Nonetheless, more and more organisations (particularly SMEs) have begun to turn from an EDI-focus to one which relies on the facilities provided by the Internet (Poon and Swatman 1997; 1999), with a consequent dependence on EC rather than on EDI.

4.1.2 Electronic Commerce phase

The term EC was first used some time around 1992 to 1993 in North America, emerging from a combination of electronic technologies and business practices. The major technologies directly enabling the development of modern EC include computer networking and telecommunications; client/server computing; multimedia (and hypermedia in particular); information retrieval systems; EDI; message handling and workflow management systems; groupware and electronic meeting systems; and public-key cryptography. Amongst these technologies, the most significant driving force of EC is the Internet. Zwass (1998) states that:

\begin{quote}
the Internet offers an open platform for new E-commerce, removing the long lead times, asset specificity, and bilaterality of E-commerce based on the traditional proprietary EDI.
\end{quote}

\textsuperscript{34} BHP (Broken Hill Proprietary Company Limited) is Australia's largest manufacturing company with significant international interest in Steel, Minerals, Copper, Petroleum, Engineering, Transport, and Information Technology. Founded in 1885 at the company's namesake Broken Hill, New South Wales, Australia, BHP employs more than 60,000 people and operates in over 60 countries.
In around 1994 – 1995, the term EC was popular in North America, but had not yet become well established in the AP region. This is shown by the offer of a subject called EC in 1995 by Hong Kong University of Science and Technology, in which only a few students enrolled with the majority of these enrolled students being from the United States (Singtao 2000).

4.1.3 Electronic Business phase

One of the first organisations to use the term *e-business* was IBM in 1997. At that time, IBM launched a campaign around the term:

*IBM Chairman Louis V. Gerstner, Jr. announces to IBM employees the debut of a major strategic campaign built around the IBM-coined term "e-business." In his first major customer address on e-business - a speech considered by many as the first "wake-up call" to Wall Street on the implications of the networked world - Gerstner describes to the Securities Industries Association the Internet's ability to challenge centuries-old business models and transform the nature of all important transactions between individuals and institutions.

(IBM 1997)*

Until then (1997) EC (or E-Commerce; eCommerce and e-Commerce) had been the “buzzword” used in North America (Amor 2000, p.7). The shift in terms was particularly significant – implying an equivalent paradigm-shift. During the EC age, merchants only focused on and experimented with selling through the Internet. Broadening the approach to allow more types of business via electronic media created the new term EB. From then on, a trend developed for the use of the term ‘e’, for example, e-Marketing, e-Government, e-Democracy, e-Health, e-Service and ultimately e-Everything (as in the theme of the Fourteenth Bled International Electronic Commerce Conference in 2001).

So what is next? Recently a ‘new’ research area was listed in ISWorld Research & Scholarship web page (ISWorld 2003) with the title u-commerce (for ubiquitous- or ultimate-commerce, depending on the source). They believe that the next wave introduced would be through wireless technology (I share the same opinion - see Chan and Swatman 2001) and that is about to change our lives even more. We will experience another wave of change – *a world that provides the ultimate form of ubiquitous networks and universal device, a world that presents an alternate view of*
space and time. Likewise, we will experience another form of commerce—a form that goes over, above, and beyond traditional commerce, i.e., "ultimate commerce" or simply "u-commerce." (Miller 2002; Watson et al. 2002). They define u-commerce as "the use of ubiquitous networks to support personalized and uninterrupted communications and transactions between a firm and its various stakeholders to provide a level of value over, above, and beyond traditional commerce" (Watson et al. 2002).

Figure 4-1 Nature of Commerce Change from Time to Time
Reproduced from: ISWorld (2003a)

Whether this wave will come and whether it will develop quickly just like the EC wave a few years ago, or simply ‘vanish’ – only time will tell.

4.2 Definitions of EC and EB

Different people will have their own interpretations of terms. In this section, I look at some of the many definitions of EC and EB and examine the differences between them. The definitions of terms can help us define clearly the ‘scope’ and the ‘meaning’ of the terms EC and EB.

4.2.1 Definition of EC

The following are some selected examples on the definitions of EC:

Kalakota and Whinston (1996)

Electronic commerce is a modern business methodology that addresses the needs of organisations, merchants, and consumers to cut costs while improving the quality of goods and services and increasing the speed of service delivery. The term also applies to the use of computer networks to search and retrieve information in support of human and corporate decision-making.

Zwass (1996)

Electronic commerce (E-commerce) is sharing business information, maintaining business relationships, and conducting business transactions by means of telecommunications networks.

35 The interested reader may wish to note that Wilkins et al. (2000) have discussed this issue in considerably greater detail than I do here.
Clarke (1997)

_The conduct of commerce in goods and services, with the assistance of telecommunications and telecommunications-based tools._

Riggins and Rhee (1998)

_While the terminology may differ, it is clear that a variety of researchers accepts a broad view of electronic commerce encompassing a wide spectrum of telecommunications applications - as long as the goal is to support the sale of products and the provision of services to the customer._

Turban _et al._ (2002)

_The process of buying and selling or exchanging of products, services, and information via computer networks including the Internet._

Despite the small difference in the meanings of the term, the consensus definition of EC is the conducting of business transactions by means of telecommunications networks.

### 4.2.2 Definition of EB

Here are some selected definitions of EB:

IBM (2001)

_e-business is based on a flow of information among businesses over the Internet. The value of e-business is a reduction in costs or an increase in revenue that come as a product of exchanging business information over the Internet. The danger of e-business is the risk of information being lost, stolen, fabricated, or corrupted as it passes over the Internet._

Northern Territory Government, Australia (2001)

_The process of conducting business functions electronically is known as eBusiness._

NOIE (2002)

_a broad definition which classifies e-business as every type of business transaction or interaction in which the participants prepare or conduct business electronically. This covers a wide range of activities, ranging from the use of electronic mail (email) and EFTPOS, through to Internet based sales and transactions and web based marketing. e-business is a business issue rather than a technology issue._

### 4.2.3 Differences between EC and EB

Mesenbourg (1999) differentiates the terms EC/EB 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.
Turban et al. (2000) also separate the terms EC and EB:

*Electronic Commerce (eCommerce)* is an emerging concept that describes the process of buying, selling or exchanging products, services and information via computer networks, including the Internet.

*eBusiness* carries a broader definition, not just the buying and selling of goods and services, but servicing customers, collaborating with business partners, and conducting electronic transactions within an organisation.

Chaffey (2002) takes a rather different approach to defining the terms EC/EB and does not restrict EC to transaction-based activities, but rather considers that EC relates to inter-organisational business exchanges, while EB covers all exchanges:

*Electronic commerce* - all electronically mediated information exchanges between an organisation and its external stakeholders.

*Electronic business* – all electronically mediated information exchanges, both within an organisation and with external stakeholders supporting the range of business process.

IBM (2002)

The term *e-commerce* is generally used to describe the buying and selling of products and services over the Internet.

The term *e-business* refers to a seamless integration of Web technology and standards with applications and core business processes that provides universal access to data and services across all types of networks.

Chaffey (2002, p.8) also presents some viewpoints on the relationship between EC and EB as:

a. EC has some degree of overlap with EB
b. EC is broadly equivalent to EB
c. EC is a subset of EB

Among all of three, c is most realistic since EC does not cover many types of transactions within a business, such as processing a purchasing order, but that are part of EB. While it is clear that there is a more-or-less general agreement that EC relates primarily to transactions, while EB is wider in its coverage, it is not easy to distinguish the literal meanings of EC and EB. It is probably fair to say that Chaffey’s views are less typical of those generally held by researchers and practitioners, but there is no true consensus on this point. I have therefore combined the terms EC and EB into a single category (EC/EB) for the purpose of studying educational degree programs in this research project.
4.3 Models and Frameworks of EC/EB

Continuing to set the scene for my investigation of new EC/EB educational program development, I move on from defining the terms EC and EB to identifying EC/EB models or frameworks which I have gathered from the literature. There are a wide variety of different types of EC/EB models or frameworks, of which the list that follows provides only a sample:

- Clarke (1993) suggests a *Five-Phase Process Model of Electronic Commerce* which is a schematic representation for electronic trading process.
- Timmers (1998) identifies at least eleven different types of business model for EC;
- Weill and Vitale (2001) present atomic e-business models where each shows a specific ownership pattern of the customer relationship, the customer data and the customer transaction;
- Bidgoli (2002) sees EC models as either extension or traditional business models and the most common six EC models are: merchant, brokerage, advertising, mixed, informediary and subscription;
- Hedman and Kalling (2002) analyse forty-two e-business models. They suggest that a common vocabulary for e-business model and business models should be developed that addresses causality between the components and includes the longitudinal process components;
- Chan and Swatman (2002a) suggest an EB model for networked learning;
- Krüger *et al.* (2003) analyse a number of approaches to identifying e-business models and suggest that they might be divided into two separate parts: a model core and a variety of “complement” components, depending on the type of industry or activity involved.

None of these examples of EC/EB models can accurately or completely reflect what EC/EB should consist of. For the purposes of my research project, however, I am only interested in those EC/EB models or frameworks which describe what EC/EB consists of, i.e. the components or domains, so that these models can act as the foundation or basic information for developing EC/EB degree programs.
In the next section, I identify five EC models and frameworks which represent the components and domain of EC and discuss some EC models which illustrate EC components; the electronic commerce typology (Wigand 1995; 1997), hierarchical electronic commerce framework (Zwass 1996; 1998), generic framework for electronic commerce (Kalakota and Whinston 1996), electronic commerce domain matrix (Riggins & Rhee 1998) and a framework for electronic commerce (Turban et al. 2002).

4.3.1 Electronic commerce typology (Wigand 1995; 1997)

Wigand (1995) identifies a number of criteria which can be used to define a typology of Electronic Commerce. The components of this typology range from one-way teleshopping broadcasts via cable and satellite television channels, through automated electronic markets, to electronic shopping on the Internet and WWW, as well as catering for fully-fledged electronic commerce utilising an electronic market maker with a set-top box in the consumer's home. Wigand's electronic commerce typology is mainly designed to categorise the “types” of EC on the basis of their electronic interactive capabilities and does not reflect the full range of EC activities. As with the other models mentioned, Wigand’s typology does not allow for virtual communities and offers only limited usefulness to those investigating the various aspects of e-health service offerings.

Table 4-1 An Electronic Commerce Typology
Reproduced from: Wigand (1997, p.6)

<table>
<thead>
<tr>
<th>Type of Electronic Commerce, by increasing electronic interactive capabilities</th>
<th>Buyers' deliberate choice/decision at time of transaction</th>
<th>Automated buying transactions</th>
<th>Degree of interactivity</th>
<th>Buying choice/decision made by computer/software on behalf of buyer</th>
<th>Direct buying choice/decision made by human</th>
<th>Potential for full-fledged electronic market</th>
<th>Role of market maker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teleshopping via television (e.g. QVC)</td>
<td>Yes</td>
<td>One-way only</td>
<td>Limited, one-way</td>
<td>No</td>
<td>Yes</td>
<td>High and successful but only partially electronic</td>
<td>High</td>
</tr>
<tr>
<td>Automated market(A): Simple, largely automated transactions (e.g. EFT, EDI, SWIFT, valued added services)</td>
<td>Yes and No</td>
<td>Largely yes</td>
<td>High</td>
<td>Largely yes</td>
<td>No</td>
<td>Limited, only transaction and processing system</td>
<td>Small</td>
</tr>
<tr>
<td>Automated Market (B): Simple transactions with some human choices/decisions required (e.g. SABRE, APOLLO, stock market transactions)</td>
<td>Yes</td>
<td>One-way only</td>
<td>High</td>
<td>Generally no</td>
<td>Yes</td>
<td>High and successful</td>
<td>Medium</td>
</tr>
<tr>
<td>Mobile and wireless cellular phone/PCS-based applications (e.g. construction industry)</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
<td>No</td>
<td>Yes</td>
<td>High</td>
<td>Small</td>
</tr>
<tr>
<td>Electronic shopping (e.g. via Internet, WWW)</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
<td>No</td>
<td>Yes</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Full-fledged electronic</td>
<td>Yes</td>
<td>Mainly one-way</td>
<td>High</td>
<td>No</td>
<td>Yes</td>
<td>High</td>
<td>Very</td>
</tr>
</tbody>
</table>
commerce utilizing electronic market maker with market-choice box (e.g. available in the future via 500 cable television systems, phone, maybe wireless, etc.)

### 4.3.2 Hierarchical electronic commerce framework (Zwass 1996; 1998)

Zwass (1996) presents a very comprehensive hierarchical framework of EC, consisting of three meta-levels: *infrastructure*, *services*, and *products and structures*; and seven functional levels, which range from wide-area telecommunications infrastructure to electronic marketplaces and electronic hierarchies.

#### Table 4-2 The Hierarchical Framework of EC

*Reproduced from: Zwass (1996, p. 2)*

<table>
<thead>
<tr>
<th>Meta-Level</th>
<th>Level</th>
<th>Function</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products and</td>
<td>7</td>
<td>Electronic Marketplaces and</td>
<td>Electronic auctions, brokerage, dealerships, and direct search markets. Interorganizational</td>
</tr>
<tr>
<td>Structures</td>
<td></td>
<td>Electronic Hierarchies</td>
<td>supply-chain management</td>
</tr>
<tr>
<td>Services</td>
<td>5</td>
<td>Enabling Services</td>
<td>Electronic catalogues/directories, smart agents-money, smart-card systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Digital authentication services</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Digital libraries, copyright-protection services</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Traffic auditing</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>3</td>
<td>Hypermedia/Multimedia Object</td>
<td>World Wide Web with Java</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Public and Private Communication</td>
<td>Internet and value-added networks (VANs)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Utilities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Wide-Area Telecommunications</td>
<td>Guided- and wireless-media networks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infrastructure</td>
<td></td>
</tr>
</tbody>
</table>

This model clearly builds upon the work undertaken by the developers of the various ‘layered network protocols’ or ‘architectures’, which have been created to explain
the inter-connection of telecommunications networking, such as the OSI Reference Model, or IBM’s SNA model – which use a similar ‘layering’ approach, where each layer has a clearly defined area of functionality. This separation of tasks means that a change at one layer does not normally affect the other layers, with significant positive implications for software developers.

The use of a similar approach to analysing EC would have equivalent benefits in terms of separating out tasks and enabling solutions to be developed without impact on other EC activities. The disadvantage of this approach, however, is that there is less flexibility because of the sequence of the layers. I believe that the components of EC are constantly changing over time as particular technologies are pressed into service. The layering approach, which works very well for networking, where the functions and activities can be fully described and do not evolve outside the limits of the model, are thus less applicable to the very mutable functions and activities of EC. The telecommunications infrastructure forms an important base for EC, but is not itself the whole of this field of study. I do, however, believe that this model has much to offer to those who are investigating the technologies of EC.

4.3.3 Generic framework for electronic commerce (Kalakota and Whinston 1996)

Kalakota and Whinston (1996) also developed a generic approach to providing a framework for EC, during the early days of the phenomenon’s growth. By a very different scheme from that taken by Zwass, they apply the metaphor of “pillars” (public policy and technical standards) to support four infrastructures (network, multimedia content, messaging and common business services) on top of which they place EC Applications.
These authors suggest that the elements of a framework for EC are a convergence of technical, policy and business concern. This model is simple to understand and visually attractive – but it lacks theoretical depth and is not particularly useful for researchers endeavouring to incorporate it into empirical research projects. I believe that this model is useful for those who are approaching EC for the first time – but do not feel that it can be used as a foundation for more detailed analytical study.

4.3.4 Electronic commerce domain matrix (Riggins & Rhee 1998)

Riggins and Rhee (1998) used the Harvard matrix approach to identify a view of EC based upon type of relationship and internal/external focus. This descriptive framework takes as its axes the ‘location of the application user’ and ‘type of relationship’, thus essentially distinguishing between intranet-based applications and those which use either an extranet or the public Internet to provide access to the applications concerned. Such a model is clearly useful to companies which wish to classify their trading partners into internal and external and, within these, into new and ongoing relationships – it categorises EC applications into four categories which can be helpful in identifying relationships and technology needs.
Despite these useful characteristics, however, the model is limited in its general identification of EC types, being primarily focused upon trading relationships. It would be more difficult to use such a model in the development of, say, a government-sponsored virtual community.

4.3.5 Framework for electronic commerce (Turban et al. 2002)

Turban et al. (2002) present a framework for EC using supporting pillars which is similar to the one previously developed by Kalakota and Whinston (1996), as Figure 4-4 shows. In this model, the supporting pillars are people, public policy, marketing and advertisement, business partners, and support services. These authors also emphasise that all these infrastructure and support components require good management practices.

The framework is more comprehensive than Kalakota and Whinston’s model, in that it involves more components. But its drawback is that it is not sufficiently flexible as all these components will change over time – particularly the five basic infrastructures which form the base of the framework.

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**Figure 4-3** Electronic Commerce Domain Matrix

*Reproduced from: Riggins and Rhee (1998, p.91)*

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The framework is more comprehensive than Kalakota and Whinston’s model, in that it involves more components. But its drawback is that it is not sufficiently flexible as all these components will change over time – particularly the five basic infrastructures which form the base of the framework.
It is clear from this brief discussion that, while all these models are useful under specific circumstances and all of them have much to offer the researcher, none of them provides an inclusive definition of EC types, activities and capabilities by itself. Yet such an inclusive model is clearly required for effective analysis of the range of EC activities in both product and service terms.

I have therefore attempted to design a more comprehensive model which will cater for the increasingly wide and varied types of EC available – a model which I call the Electronic Commerce Component Model. In this model, I have included not only Internet-based EC, but also those primarily EDI-based business-to-business activities which preceded the commercialisation of the Internet and the rapidly growing virtual communities sector of the EC “market-space”. This model is discussed in the next section.
4.4 The Electronic Business Component Model (ECCM / EBCM)\textsuperscript{36}

The first step in establishing a truly inclusive Electronic Business Component Model is clearly the development of a simple and lucid definition of Electronic Business, which I define in the following terms:

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

Zwass (1998) classified EC into three meta-levels: infrastructure, services and products and structures. Kalakota and Whinston (1996) stated that EC is supported by four infrastructures: network, multimedia content, messaging and common business services. Adam \textit{et al.} (1999) stated that EC is an interdisciplinary field of technical, business and legal issues. My starting-point was derived from all three of these views, i.e., the Electronic Business Component Model begins with an identification of the scope of EB, providing a “meta-view” of the EB world. I identified three components at the meta-view level - illustrated in Figure 4–5 legal, services and infrastructure.

![Figure 4-5 The Meta-view of EB](image)

At the meta-level, these three basic components constitute the framework of EB – and their boundaries are determined by the parties to each transaction. As my

\textsuperscript{36} This model was originally published in the proceedings of the CollecTER Electronic Commerce Conference of 1999 (see Chan and Swatman 1999) under the name ECCM – at that time the terms EC and EB were effectively synonymous. As I have already pointed out in this chapter, however, the meaning of these terms has since diverged and I have rechristened this model the EBCM.
definition has already suggested, these parties can include customers, business organisations, service providers, computer systems developers, marketing people, lawyers or, indeed, many other different groups or individuals. Different parties will set the boundaries according to their specific needs. For example, from a lawyer's point of view, the meta-view of the EBCM will be allocated as in Figure 4-6a. This allocation places very little emphasis on infrastructure, some on services – but the bulk of the emphasis is on the legal aspects of EB. This allocation is clearly the result of the lawyer’s interest in activities such as privacy and government policy – and it is only in rare cases that our lawyer will be concerned with issues such as transmission media and bandwidth (perhaps when they impinge on a case relating to legal rights to equal access for remote regions of the country).

From the point of a computer network administrator, however, the greatest emphasis will be placed on infrastructure (which immediately affects every aspects of his/her job), with fairly important weightings on legal and services because they will affect certain aspects of the job – and thus the meta-view of the EBCM would be allocated as in Figure 4-6b.

![Figure 4-6a. EBCM for a lawyer](image1)

![Figure 4-6b. EBCM for a network administrator](image2)

**Figure 4-6** The EBCM View From Different Perspectives

Because EB means different things to different people, the meta-view can reflect the differing views of any number of EB users (or Parties). The Parties define the overall size and scope of their meta-view of EB for themselves – each meta-view is a composite of many objects. The following table identifies these objects, which might be contained within each component of the meta-view. The following table was first published in the proceedings of CollecER 1999 conference. Part of the information has been amended since then.
Table 4-3 Composition of the EBCM

<table>
<thead>
<tr>
<th>Meta-view level components</th>
<th>Objects within each component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure (Technical)</td>
<td>• Telecommunications technologies&lt;br&gt;• Multimedia applications&lt;br&gt;• Internet / intranet/ extranet&lt;br&gt;• Web page development (html, java, perl, flash)&lt;br&gt;• Web page browser (Netscape, IE, lynx)&lt;br&gt;• Simulation&lt;br&gt;• Data mining/warehousing&lt;br&gt;• Network security&lt;br&gt;• EDI&lt;br&gt;• Database management&lt;br&gt;• Client/server, web server maintenance&lt;br&gt;• Internet Service Provider&lt;br&gt;• Human Computer Interface&lt;br&gt;• Smart card devices&lt;br&gt;• Wireless technology</td>
</tr>
<tr>
<td>Legal</td>
<td>• Government policy&lt;br&gt;• Government regulation&lt;br&gt;• Privacy&lt;br&gt;• Intellectual Property / Copyright&lt;br&gt;• Contractual and Legal Settlements&lt;br&gt;• Ethics / Computer Crime&lt;br&gt;• Trust</td>
</tr>
<tr>
<td>Services</td>
<td>• Internet Payment Systems (EFTPOS, EFT)&lt;br&gt;• e-publishing&lt;br&gt;• Procurement (e-catalogues)&lt;br&gt;• Types of services (B2B, B2C, C2B, C2C)&lt;br&gt;• Information kiosks (library, airline, weather forecast)&lt;br&gt;• On-line Shopping&lt;br&gt;• e-Learning&lt;br&gt;• Other Internet Commerce activities&lt;br&gt;• e-Government</td>
</tr>
</tbody>
</table>

Objects within each meta-view component can be added or deleted over time. For example, web pages are a common tool for displaying information on the Internet at present but, as time passes, other interfaces are likely to come into being – and, perhaps, become even more popular than the WWW is today. If this should occur, the web page development object can simply be removed and a new object added in its place. Objects within each meta-view component are coherent, consistent and unique. Each object has an “absolute weight” at a particular period of time which
determines its importance to EB. These weights can (and, indeed, almost certainly will) alter over time. For example, telecommunications technologies such as bandwidth and transmission rate are a major factor in EB efficiency today – largely because there is not sufficient bandwidth to cater for the needs of all users in all locations. Over time, however, we would expect that technology will resolve this problem.

As an example of the implications of such a technological change – in 2003 the telecommunications technology object might have a heavy absolute weight, such as 0.05 (here absolute weight means the weight of that object which is not affected by the meta-view at a particular period of time). Two years later, however, (perhaps by 2005), the bandwidth issues which are currently limiting EC activities are likely to have been overcome by the introduction of new technologies. The absolute weight of this object at that particular time (2005) might therefore change from 0.05 to something closer to 0.03.

The importance of each object contributing to EC is therefore determined by two factors: the relative importance of its component within the meta-view; and the absolute weight of the object itself.

Let me take this example a step further and look at how such a change would affect two different EB Parties from different market sectors:

- From a lawyer's point of view, the relative importance of the legal, services and infrastructure components of his/her overall meta-view of EB might be 0.6, 0.3 and 0.1 respectively. In 1999, the absolute weight of the network technologies object (which falls within the infrastructure component of the meta-view) is 0.07. The importance of the network technologies object to EC overall is thus 0.007;

- From a network administrator's point of view, by contrast, the relative importance of the legal, services and infrastructure components at the meta-view level are 0.2, 0.3 and 0.5 respectively. The absolute weight of the network technologies object is the same as before, 0.07. The contribution of the network technologies object for the network administrator will therefore be 0.035 – which is much greater than the lawyer's weight for the same object.
These two examples demonstrate that each of the components of EB at the meta-view level has a different degree of importance to different categories of EB participants / parties. Figure 4-7 shows the Electronic Business Component Model in its entirety.

**Figure 4-7** The Complete Electronic Business Component Model

*Adapted from:* Chan and Swatman (1999)

I will study the EC/EB curriculum and careers in the coming chapters using this model as a base.