Chapter 3  
Research strategy and methods

“Basic research is what I am doing when I don't know what I am doing.”  
~ Wehrner von Braun ~

This Chapter discusses the research strategy used to generate answers to the research question:

Are universities flexible enough to develop their EC/EB programs effectively through:

a) explicit recognition of their market-oriented nature; and

b) engagement with the concept of new service product development?

In this chapter, I will briefly:

1. review IS research philosophy;

2. discuss the methods commonly used in IS research;

3. provide an outline of the structure of this research project;

4. discuss the data analysis employed in this research project;

5. discuss and justify the chosen research method; and

6. acknowledge relevant assumptions and limitations.

I provide a brief introduction to IS research philosophy and methods in Sections 3.1 and 3.2. Next, I will give an overview of the research strategy and structure of this PhD research in Section 3.3. Data analysis is discussed in Section 3.4 and I justify my chosen research approaches and state the assumptions and limitations of this research project in Sections 3.5 and 3.6. Finally, a summary of this Chapter is provided in Section 3.7.

3.1 An Overview of IS Research Philosophy

I begin my very brief overview of IS research philosophy by quoting the succinct description of information systems provided by Clarke (1999):
Information Systems is a particular discipline, or branch of learning. It is concerned with the application of information to organisational needs. The scope of IS includes manual, computer-based and other forms of automated procedures, and applications of information technology generally. 'Information Systems' (IS) is the study of information production, flows and use within organisations.

Lee (1999, p.8) also reminds us that:

The same information system can be a success in one organisation but a failure in another, while the same organisation can experience success with one information system but failure with another. Hence, the information system and the organisation context must be studied, understood, and managed together, not separately.

In fact, information systems — not simply in relation to organisational context — are frequently considered by many researchers to be a social science (see, for example, Bjorn-Anderson 1985; Klein et al. 1991; Galliers 1992; Shanks et al. 1993; Parker et al. 1994). Among social scientists, the underlying epistemology19 which guides the IS research is categorised under two headings: positivist and interpretivist (Galliers 1992; Lee 1999 and Parker 1998). Chua (1986), Orlikowski and Baroudi (1991) and Myers (1997) add a further category to this classification: critical. According to Myers (1997), critical research assumes that social reality is constrained by social, cultural and political circumstances and aims to be emancipatory. Guba and Lincoln (1994) suggest four slightly different categories: positivism, post-positivism, critical theory, and constructivism. As the positivist and interpretivist paradigms are commonly adopted by IS researchers, however, I have focused on these as the dominant themes for this chapter and, in the next two subsections of this chapter, I will discuss them briefly.

3.1.1 The Positivist paradigm from an IS research perspective

The positivist paradigm is often known as the 'natural science model' of research. In a positivist view of the world, science was seen as the way to get at truth, to understand the world well enough so that we might predict and control it. A social scientist who appropriates the positivist research proceeds to implement, in his or her own research, an image of how research proceeds in physics, biology, and other natural sciences (Lee 1999, p.12) and there are some meta-physical assumptions20

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19 Epistemology refers to the assumptions about knowledge and how it can be obtained. Myers 1997 <http://www.misq.org/misqd961/isworld/>

20 According to Clarke (2001), meta-physical assumptions are: there is a ‘real world’; the phenomena in the real world are stable; data can be gathered by observing the real world; such data are factual, truthful and unambiguous; the domain of study is unaffected by the research; the domain of study is
associated with this view (Clarke 2001). Descriptions of the world of positivist research sometimes use the terms 'ontology' and ‘epistemology’ or ‘methodology’. These terms are taken from the philosophy of science, which itself originated and advanced positivist research as a model or an account of what science is.

Positivists’ predominant goal is to discover causal relationships or universal laws in both natural and social phenomena (Hirschheim 1992; Lin 1998; Olaisen 1991; Shanks et al. 1993; Vitalari 1985 and Visala 1991). If the causal relationship cannot be replicated in another set of data, the researcher must conclude that there was something wrong either with the sets of observations or with the understanding of the general relationship and its workings (Lin 1998). Positivist researchers believe that they can obtain valid data by taking information from thick description or case studies about variables and hypotheses (without their own influence on and/or interpretation of the phenomena) that they then test more rigorously (Hirschheim 1992; Lin 1998 and Robinson 1993).

3.1.2 The Interpretivist paradigm from an IS research perspective

In contrast to the positivist paradigm, the interpretivist paradigm gives explicit recognition to the 'worldview'. Berger and Luckman (1967) introduce the interpretive perspective in social science by showing how social reality is socially constructed. Originating in the social sciences, the interpretivist paradigm involves research procedures such as those associated with ethnography, participant observation, 

unaffected by the researcher; the language in which theory is expressed is unambiguous, and contains no value judgements.

21 There are lots of 'ologies' in research jargon, and they come from the Greek 'logos' meaning subject of interest or study. In this case the 'ont' part of the word makes it the study of 'being'. In practice, 'ontology' is the study of the nature of reality.

< http://www.stile.coventry.ac.uk/cbs/staff/g uriwin/Research_Approach.htm>

22 Trochim (1999) distinguishes epistemology from methodology as:
Epistemology is derived from the Greek words episteme, which means knowledge, and logos, which means theory. It is the branch of philosophy that addresses the philosophical problems surrounding the theory of knowledge. Epistemology is the philosophy of knowledge or of how we come to know. Methodology is also concerned with how we come to know, but is much more practical in nature. Methodology is focused on the specific ways — the methods — that we can use to try to understand our world better. Epistemology and methodology are intimately related: the former involves the philosophy of how we come to know the world and the latter involves the practice.

< http://trochim.human.cornell.edu/kb/positvsm.htm>

23 Ethnography is a specific research method and a perspective which focuses on culture and meaning in everyday life. Some practitioners of ethnography call it the 'science of the everyday', a science based on observation and absorption. The goal of ethnography is to provide a description of the world as perceived by those within that world, to understand what activities mean to the people who do them
history, and hermeneutics (refer to Bernstein 1983; Boland 1991; Gadamer 1976; Lee 1994; Myers 1995 and Palmer 1969), all of whom give explicit recognition to the world of consciousness and humanly created meanings (Lee 1999, p.17). Interpretive studies generally attempt to understand phenomena through the meanings which people assign to them and the interpretive methods of research in IS are "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (Myers 1997, referring to Walsham 1993, pp. 4-5). Interpretivist work, by contrast to positivist, can produce detailed examinations of causal mechanisms in the specific case, explaining how particular variables interact (Kaplan and Maxwell 1994; Lin 1998). They attack the positivists by arguing that due to the limitations in knowledge and values of researchers (Vitalari 1985, p.251), researchers can never be impartial when making observations of the phenomena under study (Hirschheim 1992; Lin 1998 and Shanks et al. 1993).

IS researchers use a mixture of positivist and interpretivist research approaches, depending on the type of enquiry being undertaken and the depth or breadth of the information sought. In Section 3.5 I will justify which of these approaches is appropriate for my own research project. In the next section, however, I continue this discussion of methodology and methods by discussing some of the more frequently used methods employed by IS researchers.

3.2 Methods in IS Research

There are several ways to classify IS research methods into categories and, to complicate matters further, each category may use a variety of different types of research approaches and techniques. I will briefly discuss research methods and approaches that I adopted in my research project in the next section.

and to provide an interpretive or 'thick' description of this world. <http://www.ideasbazaar.co.uk/abc.htm>

Hermeneutics means the art (or science) of interpretation and has very a long history in Western culture. In its more recent formulation by the German philosopher Hans-Georg Gadamer (1900-2002), hermeneutics is not a method of reading but an account of interpretation itself. What happens when we interpret things—not just literary texts—and what is required for understanding to be possible at all? By focusing on this basic question, hermeneutics seeks to provide a foundation for other questions that have to do with interpretation, including methodological ones. This means that even though hermeneutics is not a method of reading or a set of instructions, it may well have important consequences for how we read, what methods we choose, and what status we give our interpretations. (Nordlund 2002) what is hermeneutics? <http://www.anst.uu.se/marcnord/gadamer.htm>
3.2.1 Taxonomies of IS research methods

Taxonomies can guide the IS researcher towards an appropriate method. There are many different ways of classifying research methods, as Clarke (2000) notes:

*A further dimension of (IS) research is associated with the form of the theory on which research is based. The theory may be merely descriptive of aspects of the domain, or it may be explanatory of behaviour, or (most ambitiously), it may have predictive power. It was argued in Clarke (1997) that information systems research also has a policy dimension, which demands that some work extend even further, into prescriptive or normative mode.*

In the next section, I will pick up two popular classifications and briefly describe each of them. They are Neuman’s (1994) classification and the quantitative and qualitative classification.

3.2.1.1 Neuman’s (1994) classification of research methods

Neuman (1994) classifies research methods as being: exploratory, explanatory or descriptive. *Exploratory* research investigates an issue to establish a picture of what is occurring, and in order to generate ideas and develop theories. *Descriptive* research presents a narrative profile of the specific details of a situation, thereby inspiring a new explanation within a topic area. *Explanatory* research seeks to move beyond mere description by providing reasons for the way things occur, or the way people behave – or to demonstrate the way in which activities such as social programmes affect client groups. Most often, explanatory research makes use of quantitative and experimental designs and methodologies.

Neuman (1994) also discusses two research approaches suitable for IS research methods: *inductive* and *deductive*. The *inductive* approach is useful for theory building, where one begins with a research question and collects data to form a basis for theories or hypotheses. Lee (1999, p. 15) criticises *induction* as being:

*... useful for generating a theory, [but] it cannot contribute to the testing or justification of the theory. Even the discipline of statistical inference has distanced itself from the notion of induction.*

The *deductive* approach, by contrast, is useful for theory-testing – where the theory already exists, and data are collected to confirm or deny it. (Lee 1999, p.15), who is essentially a positivist, supports this approach. He regards:

*... the widespread characterisation of theories, even in the social sciences, as falsifiable, testable, refutable, or disconfirmable as an indication of the widespread extent to which the deductive testing of theories is practised. ...*
3.2.1.2 Quantitative and qualitative research methods

Besides Neuman’s three categories and two approaches to IS research, one of the most common distinctions made by commentators on research methodology is that existing between qualitative and quantitative research methods.

Quantitative research methods were originally developed in the natural sciences to study natural phenomena. Examples of quantitative methods now well accepted in the social sciences include survey methods, laboratory experiments, formal methods (e.g. econometrics) and numerical methods such as mathematical modeling (Myers 1997). Quantitative research is thus clearly a positivist approach to empirical data gathering.

Qualitative research methods were developed in the social sciences to enable researchers to study social and cultural phenomena. Examples of qualitative methods are action research, case study research and ethnography. Qualitative data sources include observation and participant observation (fieldwork), interviews and questionnaires, documents and texts, and the researcher’s impressions and reactions (Myers 1997). Qualitative research is not quite so clear-cut as quantitative – it can be either positivist or interpretivist in nature (for example, case studies, which are certainly qualitative, can be undertaken in a positivist or interpretivist way, producing quite different sorts of information and depth depending on their orientation.

3.2.2 Comparing research approaches

Several taxonomies of research approaches have appeared in the literature, for example, van Horn (1973); Vogel and Wetherbe (1984); Avison and Fizerald (1991); Galliers (1985; 1992); Shanks et al. (1993). Table 3-1 shows the updated comparison of research taxonomies produced by Parker et al. (1994).

**Table 3-1** A Comparison of Taxonomies of IS Research Methods

**Source**: Parker et al. (1994, p.202)

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<td>Theorem Proof</td>
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<td>Engineering</td>
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<td>Forecasting</td>
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<td>Mathematical Modeling</td>
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<td>Laboratory/Adaptive Experimentation</td>
<td>X</td>
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<tr>
<td>Field Experiment/Test</td>
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Simulation | X | X | X | X | X
Survey | X | X | X | X | X
Case Study | X | X | X | X | X
Phenomenology/Hermeneutic/Descriptive/Interpretive | X | X | X
Action Research | X | X | X | X | X
Futures Research | X | X | X | X | X
Role/Game playing | X | X | X | X | X

This interlinked structure of paradigms, approaches, methodologies and methods poses a number of questions for any would-be research in the field of IS. I have discussed two research paradigms from the IS research philosophical perspective in this Chapter. Each of them, *positivist* or *interpretivist*, contains research methods which are useful in different settings and for different purposes, and which must be compatible with the goals of the research project and the researcher(s).

Galliers (1990) provided an IS research method taxonomy and discussed the advantages and disadvantages of these methods to help researchers in the selection of the appropriate approaches for their researches. Travis (1999) basing her work on Galliers (1990), suggests the most appropriate research approaches for each of these two paradigms (see Figure 3-1 for an illustration of the research categories and tools).

<table>
<thead>
<tr>
<th>Scientific (Positivistic)</th>
<th>&lt;= Spectrum of Research Methods =&gt;</th>
<th>Interpretivistic</th>
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<tr>
<td>Theorem Proof</td>
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<td>Subjective/ Argumentative</td>
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<td>Laboratory Experiments</td>
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<td>Field Experiments</td>
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<td>Surveys</td>
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<td>Case Studies</td>
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<td>Descriptive/ Interpretive</td>
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<td>Forecasting</td>
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<td>Roles/ Game Playing / Simulation</td>
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<td>Ethnography*/Ethnomethodology*</td>
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**Figure 3-1** Research Categories and Approaches  
*Source: Travis (1999, p. 1037)*

Despite the variety of research approaches available to the IS researcher, the time comes when a sub-set of the available techniques and methods must be selected for each research project. In facing this decision, I decided to make use of surveys and positivist case-studies and, in the following sub-sections, I discuss these methods in a
little more detail. The justifications for my selection of these approaches can be found in Section 3.5.

3.2.2.1 Survey

A survey provides one way of obtaining and validating knowledge. A survey is a way of going from observations to theory validation, which has three purposes: description, explanation and exploration. A survey is defined by Burchfield (1986, p.654) as: a systematic collection and analysis of data relating to the attitudes, living conditions, options, etc., of a population, usually taken from a representative sample of the latter. Survey research is a very popular approach in IS research. During the 1996 International Conference on Information Systems (ICIS) held in Cleveland, Ohio, a panel discussed the usefulness of survey in IS research (Newsted et al. 1997). The panel report summarised the views of the panellists (and audience) as to the strengths and weaknesses of survey research as including:

Strengths of surveys:
- Surveys are easy to administer.
- Surveys are simple to score and code.
- Surveys determine the values and relations of variables and constructs.
- Responses can be generalized to other members of the population studied and often to other similar populations.
- Surveys can be reused easily, and provide an objective way of comparing responses over different groups, times, and places.
- Surveys can be used to predict behaviour.
- Specific theoretical propositions can be tested in an objective fashion.
- Surveys can help confirm and quantify the findings of qualitative research.

Weaknesses of surveys:
- Surveys are just a snapshot of behaviour at one place and time.
- One must be careful about assuming they are valid in different contexts. In particular, different cultures may produce different results. Kettinger, Lee, and Lee (1995) provide a good example of this by showing the effect of cultural differences in the measurement of IS service quality.
- They do not provide as rich or "thick" description of a situation as a case study.
- They do not provide as strong evidence for causality between surveyed constructs as a well-designed experiment.

It can be seen, therefore, that a researcher who wishes to view a phenomenon in its broadest sense, over a number of countries and a period of years, would gain
significant advantage from the use of surveys – although this approach would not provide a rich, deep understanding of the material.

3.2.2.2 Case Study

Walsham (1993; 1995) recommends case studies for interpretivist research, although this is by no means the only way in which case studies can be used as Yin (1994) makes clear. A case study is used to explore or describe a particular issue within a specified unit of study (Benbasat et al. 1987; Shanks et al. 1993; Miles & Huberman 1994 and Yin 1994). Yin (1989), taking a positivist perspective of case study research, argues that evidence for case studies may come from six sources: documents, archival records, interviews, direct observation, participant observation and physical artefacts. Case study research approach is appropriate for qualitative research particular in exploratory IS research (Cash & Lawrence 1989; Klein et al. 1991; Wood-Harper 1985). A case study may capture reality in greater detail, analysing a greater number of variables than is possible with other research methods (Galliers 1992).

Case study research can be conducted using a single case or multiple cases (Benbasat et al. 1987; Yin 1994). Benbasat et al. (1987) point out that multiple-case studies are useful when the research projects are descriptive, theory building or theory testing. Yin (1994, p. 45) suggests that the multiple-case study design has distinct advantages over the single-case design because multiple cases provide more compelling evidence and can lead to a more robust overall study.

Case study research, therefore, is particularly appropriate when a researcher wishes to gather information in greater depth than is possible using survey data.

3.2.2.3 Subjective/Argumentative and Descriptive/Interpretive

Subjective/Argumentative and Descriptive/Interpretive are two approaches for interpretivist research which have a lot in common with one another (Galliers 1992, Travis 1999). Subjective/Argumentative research is proposed as useful in the early stages of a research project, when developing a coherent and consistent theoretical model of a problem domain which can subsequently be tested by more formal means. The strengths of this approach lie in the creation of new ideas and insights; its weaknesses arise from the unstructured, subjective nature of the process (Galliers 1992).
Descriptive/interpretive research is concerned with the ability to represent reality with suppositions continually questioned and understanding of the phenomena continually refined (Galliers 1992, p.158). Clarke (2000) describes this approach as:

- The disciplined study of consciousness from a 1st-person perspective
- Subject to limited formal rigour, but controls over the researcher’s intuition include:
  - self-examination of pre-suppositions
  - cycles of data collection and analysis
  - peer review
- Phenomenology (Husserl) seeks to reject all commitments to existing theories

This critical approach to the use of literature and publicly-available information (such as Web sites) provided me with an excellent jumping-off place for my initial understanding of the creation and evolution of EC/EB university degree programs.

3.2.2.4 Triangulation

Triangulation is a technical term used in surveying and navigation to describe a technique whereby two known or visible points are used to plot the location of a third point (Mitchell 1986). Triangulation in research as explained by Foster (1997, p.1) as:

... Later applications employed the term triangulation and recognized that it may occur within methods or between methods, involving a combination of data sources, investigators, theories, or methods (Denzin 1978; Duffy 1987; Jick 1979 and Mitchell 1986). The terms between method or multimethod refer to methodological triangulation, a research design that combines dissimilar methods (e.g., qualitative and quantitative) to measure the same phenomenon.

The use of triangulation, or multi-method research to put it another way, is recommended by Denzin (1978), Gable (1994), LeBlanc (1996) and many other authors as providing greater reliability for research results. Since I am attempting to gather both broad and deep information relating to my topic, I found triangulation a most useful way of validating my understanding and ensuring a more reliable basis for the drawing of conclusions.

In the next section, I discuss the overall research strategy for this PhD project.
3.3 The Structure of the Research Project

Integrating different research methods is an important research strategy used by many IS researchers (see, for example, Clarke 2001; Kaplan and Duchon 1988; Lee 1991; Gable 1994; Poon 1998 and Swatman 1993). Hence, the overall research strategy for this PhD study combines both quantitative and qualitative research methods.

Essentially, this PhD research project consists of two major activities: theory building and theory testing; and is categorised into three parts:

- Part 1 Preliminary study – literature review for theoretical building
- Part 2 Understanding the Marketplace – quantitative analysis
- Part 3 In depth analysis – qualitative research for theoretical testing

Figure 3-2 illustrates the structure of this research project in graphical form.
3.3.1 Part 1 – preliminary study

To recap the main research question of this research project:

Are universities flexible enough to develop their EC/EB programs effectively through:

a) explicit recognition of their market-oriented nature; and

b) engagement with the concept of new service product development?

Figure 3-2 The Structure of the Research Project
In order to answer the first part of this question, which is primarily concerned with exploring the topic using the subjective/argumentative research method (Galliers, 1992), I explored a number of different research domains (including education, marketing and a newer domain area: EC/EB) within the existing literature, (see Chapters 2, 4 and 5), and also through attendance at conferences and seminars, presentations at conferences and seminars, and accessing email and web sites materials in order to define this research project. I was also accepted as a participant in doctoral consortium workshops\(^{25}\) at the ACIS’99\(^{26}\), PACIS 2000\(^{27}\) and 13th Bled EC Conferences\(^{28}\). Valuable inputs from international academics contributed to my research – particularly during the early stages.

To answer the research question stated above, then, I needed to consider six subsidiary research questions (SRQ), of which the first two questions are:

**SRQ1.** What are the relative roles of pedagogy and market orientation in constructing EC/EB tertiary educational programs?

**SRQ2.** What are the features of the development of educational service products — the degree programs?

The strategy I used to answer these questions was a critically-argued *literature review* (or a mixture of Subjective/Argumentative and Descriptive/Interpretive approaches). According to Cooper (1988)

> ... a literature review uses as its database reports of primary or original scholarship, and does not report new primary scholarship itself. The primary reports used in the literature may be verbal, but in the vast majority of cases reports are written documents. The types of scholarship may be empirical, theoretical, critical/analytic, or methodological in nature. Second a literature review seeks to describe, summarise, evaluate, clarify and/or integrate the content of primary reports.

According to Bourner (1996), there are a number of good reasons for spending time and effort on a review of the literature. Here I employ the literature review research

\(^{25}\) Doctoral consortium workshops allow PhD students to gain high-quality feedback on their research from a panel of world renowned scholars.

\(^{26}\) ACIS’99 - The Tenth Australasian Conference on Information Systems was held at the campus of Victoria University of Wellington, New Zealand, 1 - 3 December, 1999.

\(^{27}\) PACIS 2000 - The Fourth Pacific Asia Conference on Information Systems was held at the campus of Hong Kong University Science and Technology, Hong Kong SAR, 1-3 June, 2000.

\(^{28}\) 13th Bled EC Conference – The Thirteenth Bled International Electronic Commerce Conference was held at Bled, Slovenia, 19-21 June, 2000.
method for establishing the foundation in the research domains: education, EC/EB and marketing (refer to Chapters 2, 4 and 5) to identify gaps in the literature. The literature (see Section 2.2.3.2) shows that new EC/EB programs were offered by different institutions within very short time frames. However, the literature seldom shows evidence of the use of curricula development theories for these new programs or the use of any theories to support their findings. Clearly, a pedagogical approach was not a popular way of constructing EC/EB tertiary educational programs in the eyes of both “practitioners” (i.e. those creating such degree programs) or “theoreticians” (i.e. those analysing the development of new EC/EB degree programs).

This leaves us with the question of what the appropriate approach really is for such an undertaking. Is market orientation an appropriate route? Section 2.3 provides an answer for SRQ1, using Bourner’s headings:

- **to avoid reinventing the wheel** — the literature (see Sections 2.5 and 2.6) provides a background to the theories of NPD and NSD. This body of literature shows that education consists of services which can be involved in NSD. While is clear that education may be considered as a service or service product to which new service product theory/models can be applied, no one has used the theory/models of new service product for constructing educational programs.

- **to carry on from where others have left off** — the literature (see Section 2.4 ) shows that tertiary education is a quasi-market form which competes for funding and resources within institutions. Also, undoubtedly, international students bring a large amount of income to the country offering the degree program(s). If a tertiary institution is moving in a market-oriented direction, it can be argued that new degree programs can be treated as new service products.

- **to identify other people working in the same field** — the literature (see Section 2.2) provides a detailed discussion of the research undertaken into EC/EB education. It gives a snapshot of EC/EB education between the period from1997 to 2002.
to increase breadth of knowledge within a subject area — the literature (see Section 4.1) provides a broad perspective of the components of EC. It is used as the foundation/criteria to study the EC/EB degree programs.

to identify seminal works within the area — the literature (see Section 5.2) provides the definition of newness of degree programs. Section 5.3 is a review of four service product offering models. This marketing literature (Sections 5.3 and 5.4), introduces the seminal works relative to the topic of this PhD research project.

to provide the intellectual context for one’s own work, enabling the positioning of a project relative to other work — Based on the existing literature discussed in Sections 5.2 and 5.3, Section 5.4 provides an intellectual context for my own work; i.e. a model for new educational service product offering. This answers SRQ2.

Others possible reasons for conducting a literature review which are not as relevant to my own work, include:

- to identify opposing views,
- to put your work into perspective,
- to demonstrate that you can access previous work in an area,
- to identify information and ideas that may be relevant to your project, and
- to identify methods that could be relevant to your project.

Bourner (1996)

Part I, then, is the establishment of the foundation or the preliminary study for this research project and the research approach employed in this part was literature review.

3.3.2 Part 2 – understanding the marketplace

This part of the empirical research is primarily quantitative analysis. It included obtaining data from the Internet, major web-based surveys and sending questionnaires to course developers. Around 1998-99, during the initial stage of this PhD study, in order to understand the marketplace of EC/EB education, I initially identified those universities within my selected geographic region which were offering EC/EB degree programs; and sent email to the Heads of the relevant Schools. The results were listed on my web site under the heading: “Electronic
Commerce/Business programs”. My web site was very popular and the web sites of CollECTeR, Roger Clarke29 and IT Skills30 had (and still have) links to it.

With support from Professors Paula Swatman and Brian Corbitt, I also conducted a workshop ‘Teaching Electronic Commerce’ during the PACIS 2000 conference (see footnote 27 on p. 62). The conference attracted more than 180 attendees and the workshop itself attracted about 40 participants, who made a number of extremely valuable suggestions regarding EC teaching issues. The concept of ‘teaching EC’ was still comparatively new at the time of this workshop and this informal sampling of expert opinion enabled me to engage in data gathering of an exploratory nature during my earliest research stages.

In order to deepen my understanding of the nature of EC/EB degree programs, I then sent a questionnaire about the contents and skills related to such degrees to each EC/EB degree program leader.

The survey to Heads of Schools asking whether their universities did (or would) offer EC/EB programs, the Teaching of Electronic Commerce workshop at PACIS 2000, and the survey of EC degree program developers, all provided me with an essential understanding of the state of EC/EB education at its earliest stage – and will be discussed in Chapter 6 of this thesis.

Many universities offer EC/EB degree programs with information embodied in associated web sites. I also conducted a web survey, using publicly available data from the Internet, to investigate whether EC techniques are utilised by universities within their EC/EB degree program web sites for selling their educational “products” – degree programs. Finally, I also undertook a web-based survey of EC-related jobs, investigating the requirements for new graduates in this field. These two surveys will be discussed in Chapter 7 of this Thesis.

The above-mentioned five major surveys, which were conducted over the period from 1998 to 2002, provide answers for the following subsidiary research questions:

SRQ3. What is the nature of EC/EB degree programs?

29 Roger Clarke is both a professional consultant and an IS academic. <http://www.anu.edu.au/people/Roger.Clarke/>. Appendix V-2 shows that this web site had linked to my EC educational web site.

30 The IT Skills website was created by NOIE. The site no longer exists, having been replaced by the IT Skills Hub <http://www.itskillshub.com.au/>, a joint venture between NOIE and the Commonwealth Department of Education, Training and Youth Affairs (DETYA). Appendix V-2 shows that this web site had linked to my EC educational web site.
SRQ4. Are EC/EB programs service products?

Five different sets of surveys are reported in Chapters 6 and 7 of this thesis, which constituted Part 2 of this research project.

3.3.3 Part 3 – in depth analysis

The research approach for this part of the project was multiple-case studies using semi-structured interviews. The multiple-case studies were carried out in order to consolidate the new educational service product model, providing the necessary depth of understanding. They also served the purpose of providing qualitative input to the answer to the second part of the research question:

Can the effectiveness of tertiary EC/EB educational programs be enhanced through:

  a) explicit recognition of their market-oriented nature; and
  b) engagement with the concept of new service product development?

And thus also provided answers to the following two subsidiary research questions:

  SRQ5. How have universities made use of new service product concepts in creating EC/EB program?

  SRQ6. How could new service development be better used in creating programs?

In Figure 3-2, on p. 61, I have given an outline of the structure of this research project. In the next section, I will discuss the data analysis activities of this research project.

3.4 Data Analysis

Benbasat et al. (1987, p.372) suggest that researchers should closely examine the research questions to be pursued, because these often indicate an appropriate unit of analysis. In order to gather sufficient data to answer the question on which this research project is based, I undertook my data collection by means of the complementary research approaches of survey and multiple-case studies in Part 2 and Part 3 of the research overview respectively. Choosing a complementary pair of research methods requires careful consideration and justification. Gable (1994) provides a comparison of these two research approaches, suggesting that they are a
logical combination for the purposes of triangulation. The use of case study with survey can help to provide understanding of the meaning held by a subject or group when contrasted with the explanation produced by scientific observation. Table 3-2 shows the relative strengths of the survey and case study research methods.

Table 3-2 Relative Strength of the Survey and Case Study Research Methods

<table>
<thead>
<tr>
<th>Source</th>
<th>Case study</th>
<th>Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controllability</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Deductibility</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Repeatability</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Generalability</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Discoverability</td>
<td>High</td>
<td>Medium</td>
</tr>
<tr>
<td>Representability</td>
<td>High</td>
<td>Medium</td>
</tr>
</tbody>
</table>

In the next section, I will briefly discuss the data analysis employed in this research project.

3.4.1 Data analysis for understanding the marketplace

Statistical Services Centre (2001) distinguishes the three stages of data analysis as: exploratory analysis, deriving the main findings and archiving.

- **Exploratory data analysis** means looking at the data files at the early stage to get an idea of what is there. It can lead to additional data collection if this is seen to be needed or savings by stopping collecting data when a conclusion is already clear, or existing results prove worthless. It is not assumed that results from this stage are ready for release as study findings.

- **Deriving the main findings** should generate the summary findings, relationships, models, interpretations and narratives, and first recommendations that research users will need to begin utilising the results.

- **Archiving means** that data collectors keep, perhaps on CD, all the non-ephemeral material relating to their efforts to acquire information.

When I had gathered three responses at the exploratory stage, I read the answered questionnaires and examined the responses to see whether any parts of the questions were not clear. At the deriving the main findings stage, I used a software package, XLStatistics Plus for Microsoft Excel, for data analysis. All the data were kept on a CD with at least two duplicated copies. Details of the statistical and descriptive analytical techniques I used during the actual surveys, as well as the results of these enquiries, can be found in Chapters 6 and 7.
Tabulation is usually purely descriptive but I use it for effective presentations of data which I have collected. I use cross-tabulations for summary and comparative analysis of the questionnaires.

3.4.2 Data analysis for the multiple-case studies

Data collected for multiple-case studies include information taken from: the students’ handbooks of the various institutions, the brochures produced by these institutions for their EC/EB degree programs, advertisements for the degree programs taken from newspapers, data from the Internet, interviews with the EC/EB program leaders and with administrative staff members of the relevant universities. Myers (1994, p.765) identifies the central issue of quality in the presentation of case study research by quoting Dyer & Wilkins (1991, p.616):

... in evaluating quality, the central issue is whether the researcher is able to understand and describe the context of the social dynamics of the scene in question to such a degree as to make the context intelligible to the reader and to generate theory in relationship to that context.

In order to fully understand the context and not miss any valuable information during interviews, I tape-recorded all interviews except one (the interviewee was not willing to be tape-recorded during the interview, so I manually took notes) and transcribed the conversations. I applied the partially Ordered Meta-Matrix method suggested by Miles and Huberman (1994, pp.177-181) to these transcriptions for the multiple-case study data analysis. The steps of this method are described as follow:

1. Creating the display format for each case.
2. Entering the data.
3. Building the partially ordered meta-matrix and entering further-reduced data.
4. Within-category sorting.
5. Across-category clustering.

Miles and Huberman (1994, pp.177-181)

3.5 Discussion of and Justification for the Chosen Research Methods

As I have mentioned in the previous section, this research project is a composite of three major parts and the three major approaches used are literature review, survey (particularly survey on the Internet) and multiple-case studies. In the following subsections, I justify my selection of these research methods.

31 This is a software package for statistics built on Microsoft Excel and developed by Robin Boyle of Deakin University.
3.5.1 Web survey of universities in the AP region to understand the marketplace

This is the first survey of my research project which started at the end of 1998. The original target was to survey universities all over the world. After a few months of the survey, however, it was apparent that, at that time, not many universities were offering EC degree programs in the AP region; in contrast, EC courses were very popular in the United States. I therefore selected the AP region for this study, in the hope (which turned out to be accurate) that universities in this region would rapidly catch up with the US trend – allowing me to gather data at the very start of the phenomenon.

There were two motivations for this survey - firstly, to define the scope of my research — the AP region not the whole world, and secondly, to understand the EC degree programs “marketplace” in the Asia Pacific region and identify the different types of EC/EB degrees (undergraduate, masters etc.). Survey is the only appropriate method in this situation which determines the values and relations of variables and constructs, even though its weakness is just a snapshot of behaviour at one place and time (Newstead et al. 1998).

3.5.2 Literature review as the foundation of the research domain: education, marketing and EC/EB

I have discussed how I employed literature review techniques to establish the foundation (preliminary study) of this research in Section 3.3.1. Wilkin (2001, p. 139) referring to Sekaran (1992) states:

... the literature review assisted in identification and emphasis of important variables, and significant findings from earlier research, thereby formulating a foundation upon to build the current research. The approach was especially relevant given that the underlying issues spanned multiple research disciplines...

... the drawback for this approach included the time lapse between conduct of research and its subsequent publication, causing research to be superseded or out of date.

As the nature of these literature review chapters is exploratory, and this PhD research is subjective/argumentative (Galliers 1992), (see Section 3.2.2.3) I undertook an unstructured, qualitative approach, using literature review in order to develop a coherent and consistent model of a problem domain. Despite the drawback — the time lapse between conduct of research and its subsequent publication, literature review is an appropriate research method for the foundation of the theoretical
analysis and synthesis, especially under the situation of economic and time constraints.

3.5.3 Web survey to understand EC/EB education

Virtual Survey Limited (1996) conduct a survey which offers evidence that the Internet can be used as an effective data collection method and that it also has significant timing and cost benefits. Sudweeks and Simoff (1998) develop a solid academic case as a base for web-based survey on the foundation of their own empirical research. I made use of the web survey technique in the following two areas:

- EC/EB related jobs — to identify the varieties of jobs available for EC graduates.
- EC/EB degree program web sites — to investigate whether EC/EB degree program web sites themselves possess EC properties.

In both these cases, I was able to reach a wider spectrum of data than would otherwise have been possible, and to retrieve up-to-date and relevant information. The results of these two surveys are largely descriptive rather than being founded on statistical analysis, since they were intended to establish patterns of behaviour and gather preliminary data on which further detailed investigations could be based.

3.5.4 Survey of EC/EB program developers

The aim of this survey was to understand and study the EC programs in the AP region. This survey was carried out in three different formats: on the web, as an attachment to email messages, and by postal message and fax. On the first occasion, 34 responses were received from 60 survey requests. A follow-up survey was sent to the same respondents in mid 2002, although on this occasion only twelve responses were received.

Survey is an appropriate approach (or possibly the only approach) to gather data suitable for understanding EC/EB degree programs – partly because of the rapidity with which these programs were emerging at the time of the research project, and partly because of the wide geographic coverage of the institutions concerned.
3.5.4.1 Survey method for the survey of EC/EB program developers

An electronic survey can be delivered in a variety of way. Palmquist (1997a) states that:

> With the growth of the Internet (and in particular the World Wide Web) and the expanded use of electronic mail for business communication, the electronic survey is becoming a more widely used survey method. Electronic surveys can take many forms. They can be distributed as electronic mail messages sent to potential respondents. They can be posted as World Wide Web forms on the Internet. And they can be distributed via publicly available computers in high-traffic areas such as libraries and shopping malls ...

In this survey, I made use of two delivery methods: firstly, I posted the survey form on the Internet and emailed the targeted EC academics to ask them to fill in the online form. For those who did not respond, I took a second approach — distributing the survey as a file attachment to an email message. Palmquist (1997b) also discusses the strengths and weaknesses of electronic surveys. Strengths include: cost-savings, ease of editing/analysis, faster transmission time, higher response rate and potentially quicker response time with wider magnitude of coverage32. Weaknesses include: sample demographic limitations33, lower levels of confidentiality, layout and presentation issues, additional orientation/instructions, potential technical problems with hardware and software.

In this survey, I did not encounter many of these drawbacks. In terms of the sample demographic limitations, all the targeted respondents (in this case, the entire population) could access a computer and online network. There was a minor drawback relating to low levels of confidentiality, since the security level of the survey forms on my web site would not be as high as data stored on private commercial web servers, since the data I collected were stored in my ISP server or the University server. But in principal, outsiders cannot access these data. Layout and presentation issues and additional orientation/instructions are not problems for EC/EB academics, as they are already familiar with the Internet environment. Technical problems with hardware and software did not occur frequently, although the university’s server was not available 100% of the time. Overall, however, it is fair to say that a few of the drawbacks attributed to electronic surveys applied to my own survey.

32 Due to the speed of online networks, participants can answer in minutes or hours, and coverage can be global.
33 Population and sample limited to those with access to computer and online network.
For this survey, I firstly identified EC/EB program developers and directors by searching for the information on the Internet. I then checked with the administrative staff members of the various universities to confirm that these people were the EC/EB program developers and directors in their institutions. After I confirmed the targeted respondents, I sent an email message to each of them requesting them to fill in the survey form on the web. Since the population of the survey was not large, the number of replies to questionnaires was of obvious importance to the study. I therefore sent reminders to those who did not respond to the survey within a reasonable period of time.

Survey respondents thus provided their data in one of four formats:

- Firstly, the web-based form. I emailed the respondents and requested them to fill in the form on the web.
- For those who did not reply to the emailed invitation, I sent a reminder (again by email) and attached the questionnaire as a file attachment to the email message.
- For those who still did not reply, I sent by post a hardcopy version of the survey form with a postage-paid, pre-addressed return envelope. I requested them to fill in the questionnaire and return it by post.
- In a very few cases, I requested the program developers to fill in the questionnaires when I met them at an international EC conference.

The questionnaires that I sent covered all the universities offering EC/EB programs in 2000 and 2001 in the region: Australia, New Zealand, Hong Kong and Singapore. I therefore approached the whole population and not merely a sample. As a result, sixty questionaries were sent to thirty-five universities offering EC/EB programs, targeting EC/EB program developers and leaders between December 2000 and December 2001. I received 34 replies, giving me a response rate of 56.7% (quite a reasonable response). As academic staff members are busy, it is difficult to get them to spend their precious time filling in survey forms.

Diem (2002) states that a response of 50% - 60% is considered a most acceptable return rate for survey research. Lang (2002) makes the following comments about response rates for IS research:

*Non-response error may arise because those members of the sample who did not respond would have responded substantively differently from those who did respond.*
Although non response error is not the same as response rate, a higher response rate reduces the likelihood of non-response error. Few IS surveys have achieved response rates of 50% or above (Kraemer & Dutton 1991; Pinsonneault & Kraemer 1993), a level that according to Babbie (1973, p. 165) is barely adequate in social science research. Realistically, it seems that response rates in IS research are most likely to be in the range 10% - 35% (Falckner & Hodgett 1999).

I used four different approaches to acquiring responses to the questionnaires and readers may be interested to know how the 34 responses were received. Even though this does not affect the research outcomes, I have decided to include this information. Table 3-3 shows the different ways the questionnaires were received.

Table 3-3 Ways of Receiving the Questionaries from the EC/EB Program Developers and Directors

<table>
<thead>
<tr>
<th>Ways of receiving the questionnaires</th>
<th>No. received</th>
<th>% received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionnaires received directly by respondents filling in the form on the web</td>
<td>22</td>
<td>64.71%</td>
</tr>
<tr>
<td>At the start of the survey, email messages were sent and each of the academics was requested to fill in the questionnaire on the web.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>File attachments to email messages</td>
<td>2</td>
<td>5.88%</td>
</tr>
<tr>
<td>After 2 months, for those who did not respond to the questionnaires, email messages of reminders were sent, with the questionnaire attached to the email message. The replied questionnaires were in the form of file attachments in reply to the email</td>
<td></td>
<td></td>
</tr>
<tr>
<td>By post with postage paid, pre-addressed return envelope provided.</td>
<td>7</td>
<td>20.59%</td>
</tr>
<tr>
<td>The second reminder for the questionnaire was sent by post. Each letter included an invitation letter, questionnaire and postage paid, pre-addressed return envelope.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picked up directly at international EC conferences.</td>
<td>3</td>
<td>8.82%</td>
</tr>
<tr>
<td>When I came across EC academics who had not replied to the questionnaire at a conference, I requested them to fill in the survey form and return it to me directly. This was a highly successful approach, as no one objected and the respondents were glad to discuss with me the questions in the survey forms.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34</td>
<td>100%</td>
</tr>
</tbody>
</table>

The above results show that the web form was the dominant response method, followed by traditional post.

3.5.5 Use of multiple-case studies to understand the New Educational Service Product Offering (NESPO) model

Benbasat et al. (1987, p 373) state that

multiple-case designs are desirable when the intent of the research is descriptive, theory building or theory testing. Multiple cases yield more general results.

I made use of a multiple-case study approach to add the necessary depth of understanding to the new educational service product model (NESPO) and also to
provide qualitative input to the research question whether the effectiveness of tertiary EC/EB educational programs can be enhanced through engagement with the concept of new service product development.

3.5.6 Reasons for not selecting other approaches

The following sections provide a justification for not selecting alternative research approaches.

3.5.6.1 why not action research

One of the most widely-cited definitions of *action research* is found in Rappaport (1970, p. 499).

*Action research aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable ethical framework.*

*Action research* was explicitly introduced to the IS community as a research methodology by Wood-Harper (1985). Baskerville (1999, p.11) states that *the ideal domain of the action research method is characterized by a social setting where the researcher is actively involved, with expected benefit for both researcher and organization.*

Baskerville (1999, p.11) adapting Hult and Lennung's (1980) four major characteristics of IS *action research* notes that:

- *Action research aims at an increased understanding of an immediate social situation, with emphasis on the complex and multivariate nature of this social setting in the IS domain.*

- *Action research simultaneously assists in practical problem solving and expands scientific knowledge. This goal extends into two important process characteristics: first, there are highly interpretive assumptions being made about observation; second, the researcher intervenes in the problem setting.*

- *Action research is performed collaboratively and enhances the competencies of the respective actors. A process of participatory observation is implied by this goal. Enhanced competencies (an inevitable result of collaboration) are relative to the previous competencies of the researchers and subjects, and the degree to which this is a goal, and its balance between the actors, will depend upon the setting.*

- *Action research is primarily applicable for the understanding of change processes in social systems.*

These characteristics of action research make it clear that, while attractive as a way of both investigating a phenomenon in great depth and understanding the way in
which the evolution of that phenomenon affects those involved, action research would not have been helpful to me in my attempt to understand the breadth of the EC/EB degree program development. Firstly, I had no opportunity to become actively involved in creating new degree programs (as a actor), nor was I in a position to intervene in the problem setting (particularly not across so many universities in four quite widely separated countries). Action researchers are change agents – I was merely an observer who wished to understand what was happening.

3.5.6.2 why not focus group

A focus group is a qualitative research method, positioned somewhere between participant observation and in-depth interviews (Morgan, 1997), and often referred to as a group interview. Each focus group meeting consists of a semi-structured panel discussion between a small group (3 - 12) of people representing a specific target audience for the exploration, exchange and testing of ideas, feedback and brainstorming. It then generates valuable qualitative research information representing critical client interests (Edmunds 2000; Morgan, 1998; Morrison 1998; Templeton 1996 and Lichtenstein 2000).

Although focus groups are slowly starting to be accepted within the IS field as an effective technique for validating research findings – particularly those relating to the business world, which can be appropriately checked by a group of participants with experience in that field – they are both time-consuming and difficult to arrange. Further, unless a truly representative group can be brought together, there is a danger of obtaining meaningless results. Despite the attraction of this technique for testing my New Educational Service Product Offering model, I felt that the chances of bringing together sufficient suitably qualified participants from academe and marketing backgrounds were not great enough to justify the demands such an approach would make.

3.5.6.3 why not single case study

Yin (1994) suggests single-case studies are appropriate if:

1. It is a revelatory case, i.e. it is a situation previously inaccessible to scientific investigation.
2. It represents a critical case for testing a well-formulated theory.
3. It is an extreme or unique case.

In this research, a single case study is not sufficient to provide a basis for generalisation – for a number of places with similar patterns within regions:
Australia, New Zealand, Singapore and Hong Kong. A single case approach would not allow me to draw any conclusions and would provide only the most indicative evidence in this situation. I therefore selected a multiple-case study approach instead of a single case study.

3.5.6.4 why not laboratory experiment

Neuman (1994) comments on the laboratory experiment approach as a high-quality quantitative approach. The extent to which the results can be generalised to cover real world situations as a result of over simplification of the experimental situation, and the isolation of such environments from most of the variables that exist in the real world.

Considering that the model for new educational service product offering has many as yet undetermined real world variables affecting it, such as the mission of each institution, educational policies and expectations of students in different countries, it is not possible to completely identify, simulate or simplify realistically the many complex variables which can be set up in the laboratory. Hence, a laboratory experiment is not an appropriate research approach for this research project.

3.5.7 Summary of the research project

I have outlined the structure of this research project in the previous sections. This research project aims at examining whether the effectiveness of tertiary EC/EB educational programs can be enhanced through the market nature. That means it tries to understand the world well enough so that we might predict and control it. This leads to positivist philosophical research. Based on the review of marketing literature, an inductive approach is adopted to build the model for new educational service product offering. This research project presents a narrative profile of the specific details of a situation of EC/EB education, providing a new explanation of this topic area, which makes the project a descriptive piece of research. Survey research providing broad statistical data was an obvious choice as one research method; although this approach did not lend itself to the testing of the model. I made use of triangulation to solve this problem – in-depth analysis using multiple-case studies provided the richer, deeper information I needed to enhance the findings of the survey and test the model.

In summary, the strategy of this PhD research is:

- positivist,
• inductive,
• descriptive,
• both quantitative and qualitative, and
• by use of triangulation.

3.6 Assumptions and Limitations

The assumptions on which I based this research project were that:

• the data provided by the EC/EB academics accurately reflected the real situations of their institutions, that is, that respondents provided ‘honest’ data to this project;

• the term effectively in the research question ‘… develop their EC/EB programs effectively …’ is only a descriptive term and thus cannot be quantified in this project.

The limitations of this research project are:

• only four areas Australia, New Zealand, Singapore and Hong Kong were chosen to be studied as the representatives of the Asia Pacific region, but not, for example, Japan nor Korea. This is due to the limitation in the resources and the languages of the researcher.

• the project participants are EC/EB academics, a group of busy people, it was very difficult to get them to be involved in the surveys and interviews. Moreover, they could not afford to spend time having the second interviews or filling the survey forms after they had completed the first round participation.

3.7 Summary of Chapter 3

This chapter has briefly discussed the philosophy of IS research and its research methods. I also provided the structure of this PhD research project and then justified the appropriateness of the IS research methods and data analysis employed in this research. The succeeding chapters are described as follows.

• Chapter 4 describes what EC is, and based on the literature review, I develop a component model of EC which serves as the foundation of the study of EC/EB academic programs.
Chapter 5 firstly explains the term ‘newness’ in the context of educational degree programs, then discusses the existing new service product offering models. Finally based on these existing models, I suggest a new educational service product offering model.

Chapter 6 comprises 3 major surveys which serve the purpose to understand the EC/EB education. The first survey was to heads of schools to identify the EC/EB programs at their universities. This helps to understand the different segments of EC/EB degree programs. The second survey was to EC/EB academics which tried to understand the EC/EB education around the time 2000. The third survey was to EC/EB program developers to examine how the EC/EB programs being developed in their own institutions and the characteristics of their EC/EB degree programs.

Chapter 7 comprises 2 major parts: the EC/EB jobs and EC/EB degree program web sites. The data for these two studies were gathered from the Internet. This helps readers to understand the marketplace of EC.

Chapter 8 discusses the results of the multiple-case studies of EC/EB degree programs.

Chapter 9, the last chapter concludes this research project, discusses the benefit of this research and suggests future research.