SUPPORTING ORGANISATIONAL CRITICAL ACTIVITIES FROM WEB SITES: AN EVALUATION METHODOLOGY DEVELOPMENT

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ABSTRACT

"Organisational critical activities" (OCAs) are activities which must be conducted by the organisation constantly in order to be successful in the industry. They are recognised as being essential to short, medium, and long-term success in that industry, have been significantly resourced and receive regular senior management monitoring and direction. Although these activities are extremely important, some empirical studies have shown that they are not well supported by organisations, particularly in the area of Web support. This thesis develops an evaluation methodology called the "organisational critical activity Web support evaluation methodology" (OCAWSEM) which can be utilised to elicit OCAs from organisations, evaluate whether an organisation's OCAs are being supported by its Web site, and provide guidance on how the organisation can improve its Web site. To develop the OCAWSEM, this thesis reviews the relevant literature and proposes a prototype OCAWSEM. A new iterative case design (ICD) approach has been used in order to further develop the prototype, and then to test the improved OCAWSEM. The selected field cases were eight universities in New Zealand. In total, 43 semi-structured interviews were conducted with senior teams, middle level managers, and Web teams. A systematic review of these universities' Web sites was performed from the provider's, rather than the user's perspective. The outcome shows that the Developed OCAWSEM is a valid and reliable methodology for the evaluation of the support for OCAs from Web sites in the universities in New Zealand. This thesis provides useful lessons, drawn from the development and testing processes, as the basis from which to develop more specific OCAWSEMs for use in other organisational and industry contexts. Both practitioners and academicians can gain a deeper understanding of the notion of OCAs, better elicit OCAs from management, conduct Web site evaluations, and discuss the support of the Web sites for the OCAs.

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CHAPTER 1

INTRODUCTION

This chapter introduces this thesis by addressing the motivation for conducting this research in Section 1.1. Then, Section 1.2 will pose four research questions. Section 1.3 will state the definitions of some major terms which will be used throughout this thesis. Finally, Section 1.4 will outline how this thesis will be presented in the other chapters.

1.1 Research Motivation

The Web site is being integrated into all "channels" of both smaller and larger organisations because this type of powerful technology can give them global reach, and is far less expensive than other alternatives (Hall, 2001; Patel, Schenecker, Desai, & Levitt, 1998; Richter, 2000). It supports various kinds of internal, external, and inter-organisational activities, such as marketing and sales (Bhatt & Emdad, 2001;

Karakaya & Khalil, 2004; McNaughton, 2001; Sheth & Sharma, 2005), collaboration between partners (Griffiths, Elson, & Amos, 2001; Sharma, Gupta, & Wickramasinghe, 2006; Williams, Dale, Visser, & Van der Wiele, 2001a, 2001b), branding (Patel et al., 1998; Pelsmacker, Janssens, Sterckx, & Mielants, 2005; Rowley, 2004), decision-making (Paul, Saunders, & Haseman, 2005; Riggins, 1999; Zhang & Reichgelt, 2006), and transactions (Chatterjee & Ravichandran, 2004; Wen, Chen, & Hwang, 2001; Zhang & Reichgelt, 2006).

The Web site particularly supports the value-added activities in the value chain and affects how organisations conduct these activities in their value chains (Chatterjee & Sambamurthy, 1999; Lin, Yang, Tan, & Chang, 2002; Lin, Sheng, & Wu, 2005; Palmer & Griffith, 1998b; Pant & Hsu, 1996). Chatterjee and Sambamurthy (1999) found that the Web site provides a relatively inexpensive but powerful platform to conduct the entire range of primary value-added activities in the value chain. Lin, Yang, Tan, and Chang (2002) also found that Web sites support both primary and supportive value-added activities in the value chain based on their study of the hospitals in Taiwan. They revealed that extranet features on the Web sites tend to support the value-added activities in the inbound, outbound logistics, and operations areas while the Internet features tend to support those in the marketing, sales, and customer service. Palmer and Griffith (1998b) suggested that using Web sites to support value-added activities appropriately can provide a competitive advantage to an organisation.

While many studies have positively shown that Web sites are supporting a number of organisational activities, another group of studies has shown a negative result. This group of studies found that Web sites are not supporting objectives that are strategically important to organisations. For example, some empirical studies on the evaluation of Web sites in New Zealand, the US, the European Union, Asia, and Canada showed that the Web sites are not fully supporting organisational strategic objectives (Boudreau & Watson, 2006; Lederer, Mirchandani, & Sims, 2001; Tchokogue & Boisvert, 2001; Yu & Koslow, 1999). Kowtha and Choon (2001) found that few e-commerce practices have related an organisation's Web site to its strategy. Although studies have been suggesting that Web site designs should support organisations' strategies or objectives in order to be operating at peak effectiveness (Boudreau & Watson, 2006; Chorn, 1991; Dann & Dann, 2001; Lederer, Mirchandani,

& Sims, 1997; Lederer et al., 2001; Lee, 2001; McNaughton, 2001; Teubner & Klein, 1998; Yu & Koslow, 1999), the results from this group do not seem to be very supportive.

Based on previous contradictory findings, it is logical to make an inference here. Without a doubt, the Web site is supporting many organisations' activities. However, these supported activities are not recognised by organisations as strategically important to help them achieve success. Thus, whether the Web site provides strategic value to these organisations and contributes to their success is questionable.

This thesis tends to identify the specific types of organisational activities, which are strategically important for organisations to achieve success. Then, organisations owning Web sites need to make sure their Web sites are supporting these activities. When this happens, the Web site actually provides support to an organisation's success. This thesis has named these types of activities "organisational critical activities" (OCAs). Identifying OCAs gives organisations an opportunity to identify what kinds of activities their Web sites should support and ensures that their investments provide support to their success.

However, the term "critical activity" is not new in management literature. In project management, activities within the critical path are called critical activities (Son & Kim, 2001). The critical activities will have a pronounced effect on the progress of the project if a deviation occurs (Ettinger & Frank, 1981). Moreover, "critical activity" as employed in project management relates to the duration of the project and is favoured in an operational context rather than creating success for the organisation. Although the term "critical activity" is being employed in project management, its meaning does not match OCA as discussed in this thesis.

Other management areas also use this term. For example: forecasting (Rothe, 1978), public relations (Slatter, 1980), strategy formulation (Cauwenbergh & Cool, 1982), inspection (Kopardekar, Mital, & Anand, 1993), and the recruitment and selection of qualified personnel (Barringer & Greening, 1998) have been quoted as OCAs in particular areas within organisations. Davis and Roberts (1970) noted that the impetus of government objectives and programs has been an OCA of private institutions in the external environment. However, the meaning of the term "critical activity" being employed in other management areas does not match with the OCA

discussed in this thesis either. This gives a greater potential for conducting research to explore knowledge related to the notion of OCAs.

1.2 Research Questions

The previous section has suggested that organisations need to identify the OCAs which are strategically important to their achievement of success. It is logical to pose four research questions here. These questions are presented as follows.

The first question is:

> ***What kinds of activities are OCAs in organisations and what is a proper description to define these kinds of activities?***

Because the notion of OCAs is new, the answers to this question help understand the nature of OCAs.

The second question is:

> ***How can OCAs be identified, and what methodology and sources can be used?***

This question particularly concerns identifying OCAs. Without knowing the answers to this question, it is hard for organisations to identify their OCAs.

The third question is:

> ***Supposing an OCA in an organisation is identified, how can the organisation's Web site be evaluated in terms of how well the Web site supports the OCA? What methodology and tools can be used?***

The fourth question is:

> ***How can the overall support made to an organisation's OCAs from their Web site be discussed? How can the results be translated into useful suggestions to improve the Web site and what framework and method can be used?***

These four research questions will have a strong influence on the order and presentation of two chapters in this thesis – Chapters 2 and 7. They are particularly organised based on these four research questions. Chapter 2, the Literature Review, will present how the literature answers each of these four questions individually whereas Chapter 7 will discuss how the research findings answer each of them.

1.3 Definitions of Major Terms

To help reader follow this thesis more easily, this section provides the definitions of seven major terms used in this thesis: organisational critical activity (OCA), iterative case design (ICD), organisational critical activity Web support evaluation methodology (OCAWSEM), research design, research methodology, research method, and research framework.

The first major term is the organisational critical activity (OCA) which is originally defined as:

> *An activity which must be conducted by the organisation constantly in order to be successful in the industry.*

This definition has been adopted in Chapters 1, 2, and 3 of this thesis. From Chapter 4, it has been improved in order to be a more understandable description for the management in organisations. The improved definition defined the OCA as:

> *An organisational priority that is recognised as being essential to short, medium, and long-term success in that industry, has been significantly resourced and receives regular senior management monitoring and direction.*

The second major term is the iterative case design (ICD). The research methodology of this research is the case studies based on ICD. ICD is different from the traditional multiple-case design. It is defined as a research design which utilises a series of case studies in an iterative development and learning process. When adopting ICD, each case study not only includes the data collection and analysis stages which are

suggested for conducting the case studies based on the traditional multiple-case design, but also includes another stage – the reflection stage. This stage is conducted before the next case.

The third major term is the organisational critical activity Web support evaluation methodology (OCAWSEM). This is the methodology which can be utilised to evaluate the support made to OCAs from Web sites, and can then provide suggestions to improve Web sites for better support. This type of methodology is not a research methodology, and it should be differentiated.

The other four terms utilised frequently, but inconsistently, in the information system (IS) literature are research design, research methodology, research method, and research framework. Many researchers have made clarifications of them (e.g. Iivari, Hirschheim, & Klein, 2001; Raghunathan & Madey, 1999). This thesis has adapted the definitions made by previous researchers, which are shown in Table 1.1.

Table 1.1 *Definitions of four major terms utilised inconsistently in the IS literature*

Terms	Definitions	Adapted from
Research Design	A research design is an action plan for getting from the research questions to conclusions.	Rowley (2002)
Research Methodology	A research methodology is a generic approach embodying a particular style and employing different methods for understanding and responding to the research questions.	Dobson (1999); Laverty (2003); Iivari et al. (2001)
Research Method	A research method is a systematic way of collecting evidence and indicating the types of tools and techniques to be used during data collection and analysis.	Dobson (1999)
Research Framework	A research framework, which is well grounded in established theories and concepts, is a detailed research plan used to achieve predefined tasks of the research.	Raghunathan and Madey (1999)

According to Table 1.1, a research design is a broad plan which can include one or several research methodologies, while a research methodology is a generic approach which may include different research methods. A research framework is the actual and detailed plan used to perform research tasks. Applying these differentiations, this thesis will describe the research design employed in this research, which covers the research methodology, research methods, and research framework. They will be discussed in Chapter 3.

However, this thesis does not claim that the case studies based on the ICD is a new methodology, but a new design. The reason is that it is a new and specific research design based on the known research methodology – case study methodology to achieve the research objectives. More discussions on the ICD will be presented in Chapter 3.

1.4 Organisation of the Thesis

This thesis is divided into seven chapters. This chapter, Chapter 1, has posed four research questions which concern the understanding of the notion of OCAs, and the ways to elicit OCAs, to evaluate the support made to the OCAs from Web sites and to discuss the overall support made to the Web sites and how the Web sites can be improved. Then, Chapter 2 will review the relevant literature in order to find what answers the literature can provide to the four research questions.

Chapter 3 will propose a grand plan to answer the research questions to a deeper extent. This plan includes two parts. Firstly, a prototype organisational critical activity Web support evaluation methodology (Prototype OCAWSEM, for Prototype OCAWSEM, see Appendix 1) based on the theoretical foundation identified from the Chapter 2 and the tasks to further develop and test this prototype in order to enhance its quality are proposed. Secondly, a development process which has been conducted to further develop Prototype OCAWSEM to evolve to an improved methodology which is termed the developed organisational critical activity Web support evaluation methodology (Developed OCAWSEM, for Developed OCAWSEM, see Appendix 2). Then, the Developed OCAWSEM will be tested. This development process, which includes developing the Prototype OCAWSEM and testing the Developed OCAWSEM, is termed OCAWSEM Development Process.

Chapters 4, 5, and 6 present the results produced from the OCAWSEM Development Process. Each chapter will present a specific part of the results. Chapter 4 will present how the Prototype OCAWSEM has been improved through the process of developing to the Developed OCAWSEM, while Chapter 5 will show the results of testing the Developed OCAWSEM. Chapter 6 will discuss the lessons learned from the OCAWSEM Development Process. The presentation of this thesis will conclude with Chapter 7.

CHAPTER 2

LITERATURE REVIEW

This chapter will review the relevant literature in order to find the answers to the four research questions proposed in Chapter 1. It comprises five major sections. The first four sections, Section 2.1 to 2.4, are organised to find the answer for each of the four research questions respectively. Based on the previous four sections, Section 2.5 will discuss how the four research questions are answered by the literature. Section 2.6 will provide a summary of this chapter.

2.1 Understanding the OCA

This section will search the literature for the answer to the first research question:
What kinds of activities are OCAs in organisations and what is a proper description to define these kinds of activities?

2.1.1 What is an activity?

A fundamental question, which should be posed before understanding OCAs, is What is an activity? An activity is the work performed within an organisation (Turney, 1994). From a production point of view, it is what people do to convert materials and supplies into more useful forms (Odiorne, 1975). Those materials and supplies are the input, and the useful forms are finished product or services denoting the output of the activity (Odiorne, 1975; Raffish, 1994). From the information process point of view, activities convert the input information into processed information (Raffish, 1994). Activities can be found at strategic, tactical, and operational levels in organisations (Howard, Kochhar, & Dilworth, 2002; Leonard & McAdam, 2002; Svensson, 2002). Descriptions of these levels and some activities at each of them are shown in Table 2.1.

Table 2.1 *Levels of activities in organisations*

Levels	Activities at the level
Strategic	Activities at this level are carried out to oversee the organisation and plan its strategic direction. For example, deploying strategic goals, strategic benchmarking, analysing competitors, and setting competitive priorities and innovation.
Tactical	Activities at this level include the functional activities and the activities which translate strategic direction into deliverable activities. For example, translating strategic goals into functional plans, structuring resources, and efficiency and effectiveness measuring.
Operational	Activities at this level are conducted through the utilisation of operational tools and techniques. For example, the production activities, systems controlling activities.

An activity often comprises a large number of subordinate activities (Svensson, 2002). Odiorne (1975) found when top management loses sight of its purposes, they begin to enforce controlling subordinate activity which tends to become increasingly unrelated to any useful purpose. This implies that the activities within an organisation can be purposeful or unpurposeful, and at different levels.

Activities should be differentiated from processes and tasks. A number of studies described a process as a hierarchical set of interrelated activities that are embedded in a set of rules and resources which can both constrain and enable social action; and a task as the one which includes both the activities that are directly functional for achieving the aims of the process, and the resources that are either used, or modified by the tasks (e.g. Biazzo, 2000; Clark & Baxter, 1992; Convey, 1994; Lee

& Dale, 1998; Odiorne, 1975; Tallon & Kraemer, 1998; Zairi, 1997). These discussions can be summarised and illustrated by Figure 2. 1.

Figure 2.1 *The inclusions of process, task, activity, and OCA*

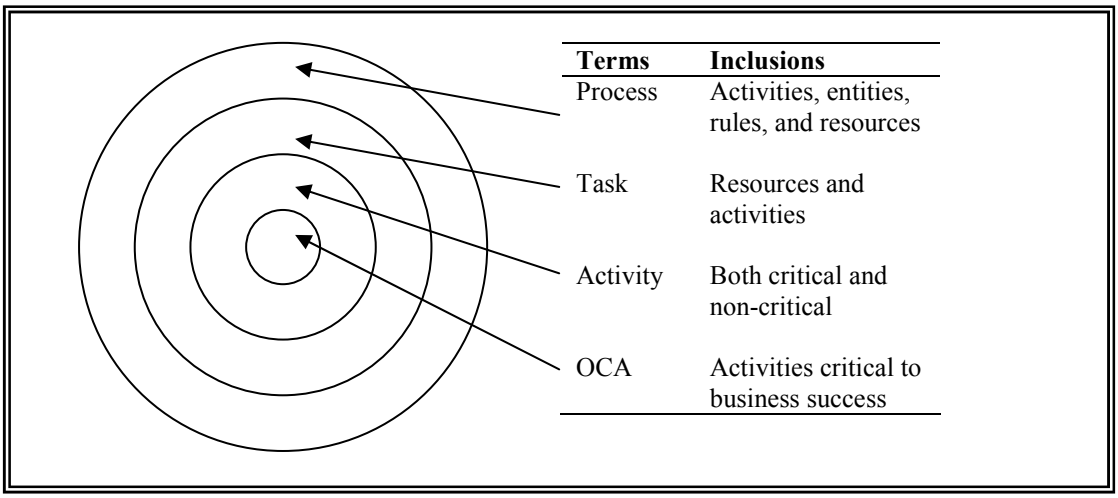
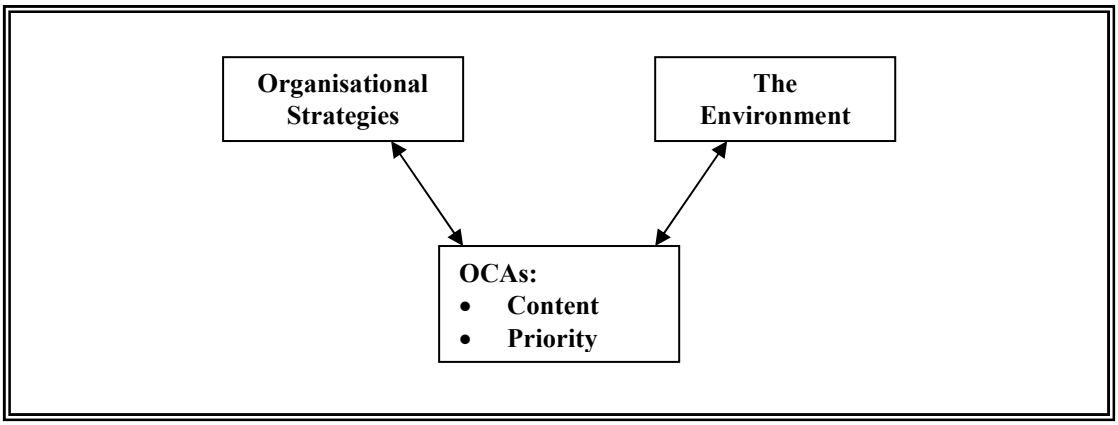


Figure 2.1 compares the inclusions between OCAs, activities, tasks, and process. Activities are central and essential in a process or a task. An activity has fewer inclusions than a process and a task because resources, entities, and rules are not included in it. Thus, the rules (e.g. the sequence) and resources of conducting a series of activities are not considered when studying the issues related to activities. Because the OCA is a type of activity, this research will not study the rules, resources, and entities related to an activity.

2.1.2 Conceptualising the OCA

The OCA can be conceptualised by explaining its interrelationships with organisational strategies and the environment and how organisations conduct OCAs to deal with their strategies and the environment. These interrelationships are shown in a conceptual model in Figure 2. 2 (see next page).

Figure 2.2 *The conceptual model for understanding the notion of OCAs*



The following three sections will explain these two kinds of interrelationship and the content and priority of OCAs in detail.

2.1.2.1 Interrelationship between OCAs and organisational strategies

There is an interrelationship between OCAs and organisational strategies. On one hand, OCAs should support organisational strategies. On the other hand, organisational strategies should direct what OCAs an organisation are enacting. Cartwright and Oliver (2000) argued that reviewing the strategies helps identify the activities in organisations. These identified activities therefore are necessary to carry out the particular strategic approach (Andreu, Ricart, & Valor, 1992). Typology and competitive priority literature (e.g. Croteau & Bergeron, 2001; Rudberg, 2004) also show that organisations using different strategies need different management structures, organisational processes, and organisational activities for success. Croteau and Bergeron (2001) even treated the strategies of organisations as comprising a series of activities. Thus, when Miles and Snow's typology (1978) was applied, organisations could not be clearly classified as one type or another based on the strategic activities pertaining to each type.

Shortell and Zajac's study (1990) also supported this argument. They examined Miles and Snow's (1978) typology in over 400 organisations in the hospital industry. The results showed that organisations classified as Prospectors will place more emphasis on the new market and new service development activities than Analysers, who in turn will emphasise such activities more than Defenders. Organisations classified as Prospectors will make the strongest market research efforts

of the three types, followed by Analysers and Defenders (Shortell & Zajac, 1990). Thus, the literature supports the interrelationship between OCAs and organisational strategies.

2.1.2.2 Interrelationship between OCAs and the environment

Should the environment have a direct interrelationship with OCAs? The literature shows that the environment does affect organisational strategies. For example, the typology literature (e.g. Miles & Snow, 1978; Mintzberg, 1978; Porter & Millar, 1985) and the IS alignment literature (e.g. Chan, Huff, Barclay, & Copeland, 1997; Venkatraman & Camillus, 1984; Venkatraman, Henderson, & Oldach, 1993) has argued that organisations need to adopt certain strategies to fit with the environment. Because the organisational strategies affect OCAs (see Section 2.1.2.1), it is perceived that the environment does have an indirect affect on OCAs.

However, it is important to realise that the effect from the environment on the OCAs is indirect, and usually takes a much longer time than the effect which has a direct impact on the OCAs. This is because when the environment affects the organisational strategies, organisations need to revise their strategies or develop new strategies before making the changes on their OCAs. Yet, revising or developing strategies is a time-consuming process (Edwards, Ward, & Bytheway, 1995). In order to take advantage of environmental changes on a timely basis, organisations may make a change to their OCAs in order to respond to the environment immediately after the environment is changed rather than wait for a change on the organisational strategies first and follow it by a change to the OCAs second.

The literature supports this inference. For example, McAdam and McCormack (2001) suggested that all process-based management techniques advocate identifying series of steps to facilitate the changes made directly from the environment. Miles, Snow, Meyer, and Coleman (1978) also revealed that organisations need a general model of adaptation which specifies the major decisions needed to manage the internal interdependencies by the organisation to maintain effective alignment with its environment. Therefore, there is a direct interrelationship between environment and OCAs.

2.1.2.3 The content and priority of OCAs

Content and priority are two important aspects for discussing the OCAs in an organisation. Within the typological fashion, Miles et al. (1978) developed a general model of the adaptive process which they call the adaptive cycle. This term is used to describe the dynamic adjustment process used by most organisations to deal with environmental change and uncertainty while managing internal interdependencies. Although organisations have numerous choices, Miles et al. (1978) categorised them into three broad "problems of organisation adaptation": the entrepreneurial problem, the engineering problem, and the administrative problem. These three broad categories of problems in each of typologies are listed in Table 2.2.

Table 2.2 *Problems of organisation adaptation in Miles and Snow's typologies*

Prospectors		
Entrepreneurial Problem	***Engineering Problem***	***Administrative Problem***
How to locate and exploit new product and market opportunities	How to avoid long-term commitments to a single technological process	How to facilitate and coordinate numerous and diverse operations
Analysers		
Entrepreneurial Problem	***Engineering Problem***	***Administrative Problem***
How to locate and exploit new product and market opportunities while simultaneously maintaining a firm base of traditional products and customers	How to be efficient in stable portions of the domain and flexible in changing portions	How to differentiate the organisation's structure and processes to accommodate both stable and dynamic areas of operation
Defenders		
Entrepreneurial Problem	***Engineering Problem***	***Administrative Problem***
How to "seal off" a portion of the total market to create a stable set of products and customers	How to produce and distribute goods or services as efficiently as possible	How to maintain strict control of the organisation in order to ensure efficiency

To overcome these problems, Cassidy (1998) suggested that information systems projects and priorities should support organisational priorities. This implies that organisations do have a priority for what they should be doing. Because those areas with high priority can help organisations succeed (Quayle, 2003), some of them are more likely to be the OCAs of organisations. Thus, organisations should have a list of OCAs which can be integrated with resources in order to overcome their typological problems and to succeed in the environment. There is a priority on these OCAs.

2.1.3 Clarifying the OCA

OCAs should be differentiated from some confusing terms which are also considered as "critical" to organisations. These terms include critical success factors, value-added activities, critical business activities, and strategies activities. The following sub-sections will clarify how these are different from OCAs.

2.1.3.1 Confusing term – critical success factors

Rockart (1979) originally proposed the concept of critical success factors (CSFs). He made an original definition for CSFs as the few key areas where "things must go right" for the business to flourish. Later, the definition of CSFs became widely accepted as meaning those few things that must go well to ensure success for a manager or an organisation (Boynton & Zmud, 1984). Thus, CSFs represent those managerial or organisational areas that must be given special and continual attention to bring high performance.

Using these definitions, CSFs seem to be the same as the OCAs discussed in this thesis. However, CSFs are different from OCAs. The results shown in the CSFs studies are not exactly OCAs.

As proposed by Rockart (1979), the original intention of CSFs methodology was to identify "those areas of activities" rather than the "factors":

> *As a result, the critical success factors are areas of activity that should receive constant and careful attention from management (Rockart, 1979, p. 85).*

Yet, in his study, both factors and activities were recognised as CSFs. For example, Rockart (1979) considered product mix, inventory, and price as CSFs for the Supermarket industry, and they were factors. However, he considered improving liquidity positioning, improving government and business relationships, and creating better societal image as CSFs for a major oil company, yet they are not factors; they are activities. A mix of factors and activities in the CSF list also can be found in other later CSFs studies (e.g. Butler & Fitzgerald, 1999; Gadenne, 1999; Lee & Cata, 2005; Sabherwal & Kirs, 1994).

Peak, Guynes, and Kroon (2005) provided a different view to justify whether critical success factors are activities or factors by treating critical success factors as

being supported by activities. Each critical success factor can be achieved through certain activities. In other words, conducting certain activities can help organisations achieve a particular critical success factor. This view is adopted by this thesis to make a differentiation between OCAs and CSFs. According to this view, OCAs are purely activities. Therefore, OCAs can be conducted to create CSFs, but they are not CSFs.

2.1.3.2 Confusing term – value-added activities

Value-added activities are the activities which create value to the customers and to the functioning of the organisation (Turney, 1994). Porter (1985) argued that a firm gains competitive advantage by performing these activities strategically, more cheaply, or better than its competitors. Integrating the activities of key parts of the value system allows large virtual organisations to be more agile and gain competitive advantage in a fast-moving market place (McAdam & McCormack, 2001). The analysis of the value-added activities presents managers with the opportunity to reduce costs by eliminating inefficiencies and freeing up resources associated with wasteful or "non-value-added" activities (Convey, 1994).

However, value-added activities are different from OCAs for two reasons. Firstly, the focuses of these two types of activities are different. As Porter (1985) suggested, a firm is profitable if the value it commands exceeds the costs involved in creating the product. To this end, the main requirement for recognising an activity as a value-added activity is that this activity is conducted more cost effectively than competitors and is able to create value for the firm. Yet, the main concern for recognising an activity as an OCA is that this activity helps the firm achieve its success. In comparison, value-added activities are about increasing the value and reducing the cost whereas OCAs are about achieving organisational success.

Secondly, the levels of these two types of activities are different. Porter (1985) suggested that value-added activities should be assigned to categories that best represent their contribution to a firm's competitive advantage. Therefore, the value-added activity can be at various levels of activities (e.g. strategic, tactical, or operational) in an organisation as long as the activity creates value. Yet, the level of OCAs is relatively higher than value-added activities because OCAs are those activities which have a strong and direct impact on organisational success rather than

functional or operational success. For these two reasons, value-added activities are different from OCAs.

2.1.3.3 Confusing term – critical business activities

Critical business activities denotes those activities which are carried out to achieve the organisation's strategic approach (Andreu et al., 1992). Critical business activities must be the activities which are critical to create the organisation's strategic advantage (Byrd & Turner, 2001; Day, DeSarbo, & Oliva, 1987; Sethi & King, 1994). Thus, whether the activity can enable the business to create its strategic advantage is the main concern when identifying critical business activities. However, creating strategic advantage is different from achieving success. Furthermore, the critical business activities which emphasise the functional activities (Day et al., 1987) are different from the OCAs which have a focus on the organisational activities. Thus, critical business activities are different from OCAs.

2.1.3.4 Confusing term – strategic activities

Strategic activities are identified based on the view that the organisational strategy is defined as actions taken by an organisation to reach its objectives and seen as a series of activities (Croteau & Bergeron, 2001). Thus, identifying strategic activities is to seek the activities which fit with the organisational strategies. Botten and McManus (1998) suggested that each strategic business unit should formulate its own strategic activities to achieve its mission given by the organisational strategy. Azzone and Masella (1991) also suggested that strategic activities must be kept strictly under control. Strategic activities are more concerned with whether the activity supports the organisational strategies rather than whether the activity actually enables the organisational success, thus they are different from OCAs.

A summary of Section 2.1.3 defines confusing terms which are different from the OCA as discussed in this study. The major focuses of OCAs and these four confusing terms are summarised in Table 2.3 (see next page).

In addition, OCAs are not newly invented activities. They are existing activities which are termed as OCAs. For example, Researcher A has termed ten activities from an organisation as "OCAs". Researcher B also has termed eight activities from the same organisation as "strategic activities". It is possible that three

activities are both termed as OCAs by Research A and as "strategic activities" by Research B. Thus, the method used to identify the OCAs is the key to identify an activity as the OCA. The next section will shed light on this method.

Table 2.3 *Major focuses of OCAs and the four confusing terms*

Terms	Major Focuses of the Terms
Organisational Critical Activities	On the activities which enable organisations to achieve their predefined success
Critical Success Factors	On the factors and activities which enable organisations to achieve their predefined success
Value-added Activities	On the activities which create more value
Critical Business Activities	On the activities which create organisational strategic advantage
Strategic Activities	On the activities which help organisations achieve their strategies

In a summary of these clarifications, OCAs are different from CSFs, value-added activities, critical business activities, and strategic activities because of their focus. However, OCAs are not newly invented activities. Thus, the method used to identify the activities as OCAs is very important.

2.2 Eliciting OCAs

This section will search the literature for the answer to the second research question: How can OCAs be identified, and what methodology and sources can be used?

As discussed previously, many frameworks have been proposed to identify specific activities which are critical in organisations. Yet, these methodologies cannot identify OCAs. However, this research has found that the specific approaches and methods used for eliciting organisational strategies are proper for eliciting OCAs. The following sub-sections will discuss how these are chosen and can be adapted.

2.2.1 Proper approach to eliciting OCAs

To elicit organisational strategies, Venkatraman (1989b) described three approaches: narrative, classificatory, and comparative. The narrative approach, which reflects the case-based tradition of business policy, is predicated on a view that the complex

characterisation of the construct, strategy, should only be described in its holistic and contextual form (Venkatraman, 1989b). Thus, the strategy is manifested as a description of the strategic intention and plan related to the organisation specifically, not to others.

The classificatory approach includes the classification frameworks. These frameworks are sometimes called taxonomies or typologies, and are inductively derived organisational strategies arranged into a set of parsimonious classificatory dimensions. This approach is the first movement away from the idiosyncratic, narrative descriptions of strategy, and is reflected in the development of strategy classifications (Venkatraman, 1989b). Many classification frameworks are proposed by strategic management researchers, such as Miles and Snow's (1978), Porter's (1985), and Miller & Friesen's (1978) framework. Each one has specific descriptions to help organisations fit themselves into one of the typologies.

The comparative approach aims to identify the key dimensions (or key traits) of the construct (Venkatraman, 1989b). In comparison with classificatory approach, the focus of this approach is less on categorising the organisation's strategy into one particular cell of the typology and more on measuring the differences along a set of dimensions that collectively describe the organisation's strategy. For example, Venkatraman (1989b) proposed an instrument called STORBE (Strategic Orientation of Business Enterprises) to measure the strategic orientation of organisations. STROBE comprises six dimensions including aggressiveness, analysis, defensiveness, futurity, proactiveness, and riskiness. Chan, Huff, Barclay, and Copeland (1997) refined the six dimensions in Venkatraman's (1989b) STROBE instrument into eight. The refined STROBE includes aggressiveness, analysis, internal defensiveness, external defensiveness, futurity, proactiveness, risk aversion, and innovativeness dimensions. They believed eight dimensions provide finer distinctions than the six dimensions provided by original STROBE.

There is another approach which is to adopt both the classificatory and comparative approaches. This approach allows assigning organisational strategy into a particular type and also measuring the differences along a set of dimensions that describe the organisational strategy. For example, Sabherwal and Chan (2001) developed six strategy dimensions to examine Miles and Snow's (1978) typology. These dimensions are defensiveness, risk aversion, aggressiveness, proactiveness,

analysis, and futurity. Thus, the strategy of an organisation can be described by both the typology and the key dimensions the strategy belongs to.

All of these four approaches can be possibly adopted to elicit OCAs. However, the comparative approach is more appropriate for eliciting OCAs because OCAs are already a list of activities. They are neither manifested in a description form to describe the construct OCA, nor typifying some parsimonious categories for distinguishing the construct OCA into typologies. They are more likely to be the "measures" of the construct OCA. Thus, the comparative approach should be adopted for eliciting OCAs.

However, as mentioned earlier, developing dimensions is necessary when adopting a comparative approach. Thus, the question is how the dimensions of OCAs can be developed.

Venkatraman (1989b) argued that the development of dimensions can be *a priori* or *a posterior*. The *a priori* approach develops the different dimensions of the strategy based on the theoretical perspectives, whereas the *a posterior* approach tends to not pre-specify the dimensions but to empirically derive dimensions through data analysis techniques. In comparison between these two approaches, Venkatraman (1989b) pointed out that the *a priori* approach involves a more theoretical rather than an analytical foundation and is more stable in different kinds of study settings. This research accepts this suggestion. Thus, the next step is to develop the dimensions for eliciting OCAs.

2.2.2 Developing the generic OCAs

The dimensions of OCAs are terms such as "generic OCAs" in the following context of this thesis. They are broad terms of the OCAs that can be applied directly or applied slightly renamed to any organisation in various industries. The purpose of developing generic OCAs is to provide some "dimensions" to help elicit the OCAs in organisations.

A review of literature is an appropriate way to develop generic OCAs. This has been frequently suggested and employed by researchers to generate a number of measurement dimensions (e.g. Kearns & Lederer, 2003; Sethi & King, 1994). Two key words in the definition of OCAs are crucial while reviewing the literature and developing generic OCAs: "constantly" and "successful". These two key words show

that generic OCAs are constant activities and are also critical to an organisation's success. Nevertheless, they must be generic in order to be applied to the organisations in various industries.

This thesis developed 31 generic OCAs through a review of relevant literature which reports various organisational activities (Azzone & Masella, 1991; Burton & Pennotti, 2003; Byrd & Turner, 2001; Feeny, 2001; Porter, 1985; Shortell & Zajac, 1990; Tallon, Kraemer, & Gurbaxani, 2000). These generic OCAs are arranged into four categories – marketing related, internal, external and inter-organisational, and service related, and they are shown in Table 2.4.

Table 2.4 *Some generic OCAs identified from the literature*

Category	Generic OCAs
Marketing Related	Advertising; Promoting Product; Conducting marketing; Conducting marketing research; Imaging and branding; Recruiting; Expanding on sale points
Internal	Conducting general research; Innovating and developing product; Developing new services; Managing information; Managing knowledge; Assuring product quality; Enhancing operational efficiency; Measuring cost performance; Communicating internally; Developing strategic plan; Training staff; Developing new technology; Creating organisational culture
External and Inter-organisational	Maintaining supplier relationships; Retaining staff; Acquiring material; communicating externally; Aligning with external environment; Maintaining partnerships
Service Related	Providing after-sale service; Maintaining customer relationships; Providing timely customer financial and transaction information; Distributing product

However, a crucial point must be made here. These generic OCAs are not exhaustive at this stage as there are hundreds of activities in organisations which are being constantly conducted and are critical to the success of organisations. These generic OCAs are just some of those which are derived from a group of literature. They are still testable and require further renaming before they can be applied to a specific organisation. Chapter 3 will discuss how this can be achieved.

2.2.3 Proper method of eliciting OCAs

According to previous Sections 2.2.1 and 2.2.2, the proper approach for eliciting OCAs is the comparative approach and the *a priori* approach to develop the generic OCAs. A number of generic OCAs have been identified. The next task is to

understand what methods are available to elicit organisational strategies, and which of them can be the proper method of eliciting OCAs.

Snow and Hambrick (1980) suggested four different methods to elicit the strategy of organisations: investigator inference, self-typing, external assessment, and objective indicators. In the approach of investigator inference, the researcher uses all the information available to assess the organisation's strategy. The self-typing requires the organisation's managers to characterise the organisation's strategy. The external assessment attempts to extract strategy by obtaining the ratings of individuals external to the focal organisation. The objective indicators method relies on the assessment of published objectives of the organisations for extracting the strategy.

As Snow and Hambrick (1980) revealed, the investigator inference, external assessment, and objective indicators methods require the researcher to have enough knowledge of assessing all kinds of information to be able to generate the organisation's strategy. When adopting these three methods for eliciting OCAs, the researcher needs to have enough knowledge and mature skills to elicit OCAs from the secondary data (e.g. organisational documents). However, the notion of OCAs is new and the understanding of these types of activities is currently limited. The researcher has limited understanding and skill to elicit OCAs. These three methods are not appropriate. Therefore, the self-typing is more suitable to this research, and it is also an effective way to elicit strategies of organisations (Shortell & Zajac, 1990; Tan, 1994).

There are two issues which should be considered when adopting self-typing to elicit OCAs. The first issue is the way of self-typing. There are two popular ways of self-typing – interview (e.g. Broadbent & Weill, 1991; Broadbent & Weill, 1993; Chan, 2002; Pyburn, 1983; Reich & Benbasat, 1996; Reich & Benbasat, 2000; Schneider et al., 2003) and survey (e.g. Chan et al., 1997; De Vasconcellos & Hambrick, 1989; Sabherwal & Chan, 2001; Sethi & King, 1994; Teo & King, 1996; Zviran, 1990). The second issue is whether the generic OCAs are supplied to the participants (interviewees or surveyees) in the interaction or not. In regard to these two issues, four alternatives are available to elicit OCAs from management, which are shown in Figure 2.3 (see next page).

Figure 2.3 *Alternatives to elicit OCAs from management*

	Generic OCAs Supplied	Generic OCAs Not Supplied
Survey	**I** Supplying generic OCAs in a survey	**II** Without supplying generic OCAs in a survey
Interview	**III** Supplying generic OCAs in an interview	**IV** Without supplying generic OCAs in an interview

When adopting alternative I, a survey with a list of generic OCAs is sent to management. The management is asked to reveal the OCAs in the organisation. Because they have been given a list of generic OCAs, they can easily reveal what OCAs they are conducting. Yet, there is a tendency for this to discourage the surveyee from revealing more OCAs. Thus, this alternative is more appropriate when there is no need to elicit extra OCAs which are unknown to the researcher.

When adopting alternative II, the survey is sent without providing a list of generic OCAs to the respondent. Thus, they will reveal the OCAs which they believe they have. Some of them may not be in the list of generic OCAs. Thus, this choice is suitable to exploring unknown OCAs. However, there is no interaction between the researcher and the surveyees when the surveyees have difficulty in compiling a list of OCAs. Thus, this alternative is appropriate when the surveyees can understand the meaning of OCAs and have no difficulty in identifying them.

When adopting alternative III, the interview is conducted with generic OCAs supplied to the interviewee. The interview method is more interactive and explorative than the survey method. Thus, this alternative can help the researcher not only to generate a list of OCAs, but also to elicit more knowledge underlying the OCA list. However, supplying generic OCAs in the interview will still discourage the interviewee from sharing some OCAs additional to the generic list. Thus, this alternative is appropriate when the researcher needs to explore the knowledge underlying the OCAs list and there is no need to elicit extra OCAs which are unknown to the researcher.

When adopting alternative IV, the interview is conducted without supplying a list of generic OCAs to the interviewee. On one hand, the interview method allows more interaction to elicit more knowledge about OCAs from management by asking more useful and interactive questions. One the other hand, it is also suitable to elicit and identify some unknown OCAs from the interviewee since the generic OCAs are not supplied. Thus, this alternative is appropriate when the researcher needs to explore the knowledge underlying the OCAs list and there is a need to elicit extra OCAs which are unknown to the researcher.

The alternative IV is most appropriate in this research. This is because this research needs to explore the knowledge underlying the OCAs list and also to elicit OCAs additional to those activities developed from the literature. Thus, the interview without supplying generic OCAs is suitable to achieve the purposes of this research. Although the generic OCAs are not utilised in the interviews, they can be helpful for the researcher in eliciting OCAs from the interview transcripts (Sethi & King, 1991).

However, there are two considerations suggested in the literature for conducting interviews with management to elicit organisational strategy which should be considered when eliciting OCAs. The first consideration is to distinguish the intentions and realisation of the construct. This consideration is particularly used to differentiate between "intended" and "realised" (Mintzberg, 1978) strategies relevant for circumscribing and measuring this construct. This research chooses to elicit the realised OCAs. Thus, it is to elicit the OCAs which are realised by the management, not those which they intend to conduct.

The second consideration is to distinguish between whether the revelation of the construct is from the organisation's or the person's perspective. Chen et al. (1997) suggested that eliciting strategic orientation from the management is subjective. The respondent would describe the nature of the organisation or the "personality". They argued that there may be a tendency for CEOs to overstate the strength of their perspectives. This research focuses on eliciting the OCAs from the organisation's perspective. Thus, it is important to identify those OCAs which are revealed by the respondents from the organisation's perspective.

Previous sections have discussed the approach and method which can be utilised to elicit OCAs from management. The appropriate approach and method for this research have been chosen. However, these sections only provide a grand

approach and method, which are based on the literature, to elicit OCAs. More discussions on the detailed plan for eliciting OCAs can be found in Chapter 3.

2.3 Evaluation of Web Sites

This section will search the literature for the answer to the third research question: How can the organisation's Web site be evaluated in terms of how well the Web site supports the OCA supposing an OCA in an organisation is identified; and what methodology and tools can be used?

2.3.1 What is a Web site?

One fundamental question concerning the evaluation of Web sites is what a Web site is. A Web site is an aggregation of information stored in multiple kinds of documents structured in the Web language formats, such as Hypertext Markup Language (HTML), and Extensible Markup Language (XML) formats (Herrera-Viedma, Peis, Olvera, Herrera, & Montero, 2003). The information document can be audio, frames, video, hyperlinks, and text.

According to Thelwall (2003), the Web can be conceived as a mathematical graph comprising a number of Web pages. A Web page is a single page of information stored in multiple kinds of documents structured in the Web language formats. Web pages are also called nodes, and are connected by the hyperlinks between pages. The Web page functions could be informational, navigational, search or transactional (Gillenson, Sherrell, & Chen, 2000).

An aggregation of Web pages, which serve the same purposes, is called a sub-site. A Web site may include a number of sub-sites serving various purposes. Thus, a Web site can include many sub-sites, and a sub-site can include many Web pages. These definitions are adopted by this thesis. The terms sub-site and Web page will be utilised later in this thesis.

2.3.1.1 Web site structures

Understanding the structure of a Web site is helpful in evaluating Web sites. Atzeni et al. (2002) divided a Web site into two main categories based on the objectives of Web

pages: generic and domain. The generic objectives refer to the pages providing information to most of the users while the domain objectives refer to the pages providing information to a particular group of users. Thelwall (2003) distinguished university Web sites into four levels: individual Web page, directory, domain name, and university level. Individual Web Page level means each separate HTML file which is a self-contained individual resource. Directory level means all HTML files in the same directory are treated as a document. Domain name level means all HTML files with the same domain name are treated as a single document for both link sources and link targets. The university level means all pages belonging to a university are treated as a single document for both link sources and link targets.

The structure of a Web site can be classified into more levels. According to Gillenson, Sherrell, and Chen (2000), a Web site comprises five hierarchical types of Web site page: Splash, Site Directory, Foundation, Intermediate, and Terminal pages. The Splash Page is the first page where a user enters into the Web site, and is sometimes called the Homepage. A Site Directory is a page or group of pages indicating the major subdivisions of the Web site. A Foundation Page is the entrance of a major subdivision of the Web site which is directly reachable from the Site Directory. An Intermediate Page is a page below the Foundation Pages that contains links pointing into it and links emanating from it. A Terminal Page is a page at the very end of a chain of Web site branches, and the "bottom" of the Web site.

Gillenson, Sherrell, and Chen (2000) pointed out some major distinctions between some of these types. In most Web sites, the Foundation Page can be reached by pushing a hot button on the Site Directory pages. A Web site's Intermediate Pages contain the bulk of the informational and transactional material that the Web site has to offer. In addition, a Web site typically includes several or many levels of Intermediate Pages. A Terminal Page is a page which may not link to a lower-level page. However, they can link back to the page from which they are reached.

2.3.1.2 Internet, intranet, and extranet Web sites

A Web site is sometimes confused with the Internet, intranet, or extranet. Yet, they are different, and should be distinguished in the evaluation of Web sites. The Internet implies the use of both the public and private telecommunications networks to extend and interconnect information technologies inside an organisation and out (Schlenker

& Crocker, 2003). Intranets are electronic applications that are internal to organisations (McIvor, Humphreys, & Huang, 2000). They have been used to support internal work within an organisation (Isakowitz, Bieber, & Vitali, 1998). In contrast, extranets are a blend of external systems to support electronic communication (Isakowitz et al., 1998). The major difference between intranet and extranet is not defined by a physical boundary or by geographical constraints, but by who has access to the information (McIvor, Humphreys, & Huang, 2000).

Once the Web site is linked with the Internet, intranet or extranet, it has a Homepage and different levels of Web pages (Dann & Dann, 2001; Wan & Chung, 1998). Integrating the Web site with Internet, intranet, and extranet are termed as Web-based systems (Bakry & Bakry, 2001; Isakowitz et al., 1998; McIvor et al., 2000). Within this system, the Internet, intranet, and extranet are the medium, whereas the Web site is the final interface or the medium through which the organisations can connect with their publics (Dann & Dann, 2001; Palmer & Griffith, 1998b).

The Web is a type of information (IT) utilised by organisations to achieve efficiency, effectiveness, and strategic benefit (Lederer et al., 1997; Riggins, 1999; Teubner & Klein, 1998). However, it is a specific type of IT because it is a vehicle through which organisations and individuals may communicate with and exchange information with each other as never before (Jones & Kayworth, 2002). It has more abilities to enable the many-to-many communication model, interactive activities, and personal control of the communication than traditional IT, for example, television, movies, phone, and fax (Hoffman & Novak, 1996). Although organisations can adopt some frameworks and models which are valid to evaluate traditional information technologies, they may not be valid to evaluate Web sites. For example, Jones and Kayworth (2002) found that Web sites enable firms to conduct business and interact with external stakeholders differently than other types of IT do. Thus, traditional performance measures may not be adequate to capture its effectiveness. Thus, the evaluation of Web sites needs more specific methods or frameworks.

2.3.2 An overview of Web site evaluation

Enormous evaluation frameworks and models have been proposed to evaluate Web sites since this new and powerful information technology has been introduced. The

motivation for evaluating organisations' Web sites comes from a discrepancy between what organisations believe their Web sites can accomplish and what is actually accomplished (Kent, Taylor, & White, 2003). Moreover, the unwillingness of businesses to disclose information and to be interviewed about their experience of implementing Web sites has encouraged researchers to exam the Web site directly (Lu & Chan, 1999).

The earlier attempts on the Web site evaluation were the purely subjective form of individual preferences of the assessor, such as, "Cool Links", "Top Lists", or "Hot Sites", and were in the objective form of statistical measurement, such as, monitoring the download time of the site and site traffics (Ho, 1996). However, because Web sites have become more complicated and the number of Web pages has increased considerably, these forms are not able to evaluate Web sites effectively.

The later attempts have been on the development of more systematic methods or frameworks. For example, Kirkwood (Kirkwood, 1998) presented a model comprising a set of criteria for cooperative evaluation of Internet resources for librarians. Ho (1997), Rachman and Buchanan (1999), and Selz and Schubert (1997) defined theoretical assessment frameworks.

Some also focus on the evaluation of certain types of Web sites. For example, a number of attempts at evaluation of consumer-oriented Web sites have been developed and published in the last few years. The common issues include quality (e.g. Cao, Zhang, & Seydel, 2005; Cox & Dale, 2002; Herrera-Viedma, Pasi, Lopez-Herrera, & Porcel, 2006; Loiacono, 1999; Mich, Franch, & Gaio, 2003; Rettig & LaGuardia, 1999); Web design (e.g. Gehrke & Turban, 1999; Ivory & Megraw, 2005; Shneiderman, 1997; Thelwall, 2003; Wan & Chung, 1998); and usability (e.g. Agarwal & Venkatesh, 2002; Chen & Macredie, 2005; Konradt, Wandke, Balazs, & Christophersen, 2003; Nielsen, 1993; Palmer, 2002).

As Hix and Schulman (1991) suggested, the development of an evaluation framework on the IS should have a purpose. It is important to decide the purpose of the Web site evaluation in this research. The purpose of the Web site evaluation in this research is to evaluate how well the Web site supports the OCAs. Thus, this research needs to select the proper methodology to achieve this purpose. The next three sections will review a number of evaluation perspectives, evaluation criteria and evaluation methodologies, and select the proper ones for this research.

2.3.3 Searching for proper evaluation perspectives

A number of perspectives have been adopted when evaluating a Web site. For example, Cooper (1998) found researchers adopted the perspectives of the user, the manager, the systems designer, and the customer services representative to evaluate a Web site. In order to search for a proper perspective for this research, the following sub-sections will discuss two issues. One is to identify whether the evaluation is conducted by the provider or user. The other is to consider whether the evaluation can add value to the organisation which provides the Web site or to the customers.

2.3.3.1 Issue 1 – from provider or user perspective

The first issue to be considered is whether the evaluation is conducted by the provider or user. The distinction between the evaluation of Web sites from the perspectives of the user and provider can be known as the distinctions between "browser" and "author" (Chalmers, Rodden, & Brodbeck, 1998), "customer" and "merchant" (Wang, Head, & Archer, 2000), "user" and "developer" (Collings & Pearce, 2002) or "user" and "owner" (Mich et al., 2003). The evaluations made from these two perspectives are different (Auer & Petrovic, 2004; Chalmers et al., 1998; Collings & Pearce, 2002; Wang et al., 2000; Yuan, Caulkins, & Roehrig, 1998).

Collings and Pearce (2002) employed different groups of students to develop Web sites. After each group had developed their Web site, they were asked to evaluate another group's Web site. This process provides students with the experience of how to assess ease of use of the Web site from both a provider and a user perspective. The results show that there are differences between the perceptions of ease of Web sites use from these two perspectives. Collings and Pearce's (2002) study also confirms the gap that exists between the provider's and the user's perceptions of the service being delivered (Cox & Dale, 2001; Parasuraman, Zeithaml, & Berry, 1985).

As Chalmers, Rodden, and Brodbeck (1998) suggested, these two perspectives are different in the analysis of Web sites. The provider cannot fully understand what the user has perceived, and vice versa, the user cannot realise what the provider expects to achieve.

2.3.3.2 Issue 2 – adding value to the organisation or customer

The second issue that should be addressed is whether the evaluation is adding value to the organisation or to the customer. The organisation is the party who provides the Web site. In contrast, the customer represents those parties who do not provide, but use the Web site.

In terms of adding value to the organisation, Jain, Zhao, and Chinta (2004) suggested that the organisational nature of Web services allows managers to identify the Web services that satisfy their organisational needs. Studies have shown that companies receive value from employing a Web site including, for example, cost reduction (Kraemer & Dedrick, 2002; Pant, Sim, & Hsu, 2001), maintenance of long-term customer relationships (Geissler, 2001), and reshaping of relations with public (Kent et al., 2003). The focus in this perspective is on how well the Web site supports the organisation's needs.

In terms of adding value to the customer, Web sites should focus on satisfying the customer by offering valuable, changing content that will not only attract new customers from many countries but also encourage them to return (Quelch & Klein, 1996). Customer satisfaction is achieved when the customer's evaluation of the interaction meets or exceeds his/her expectations (Escalas, Jain, & Strebel, 2001).

Adding value to these two parties is different. Yuan, Caulkins, and Roehrig (1998) proposed a good example to illustrate the difference. In terms of adding value to the organisation, the product information is the content for the organisation to conduct the "advertising" activity intended to induce purchases of their products or stocks on the Web site. In terms of adding value to the customer, the product information is just the content for the customer to conduct their "transaction" activities on the Web site.

When identifying whether the value is added to the organisation or the customer, Auer and Petrovic (2004) suggested asking what benefit the Web site provides for the customer when seeking the benefit to the customer; and asking what benefit is created for the organisation by offering this Web site when seeking the value to the organisation. Quayle (2003) argued that customers may have focused simply on products and not the process. Thus, customers are more concerned with utilising Web sites to gain better quality, pricing, reliable products, and services and support. Those areas, such as developing new technology and Research and

Development (R&D) are perceived as low value by the customers, but as higher by organisations.

2.3.3.3 Four Web site evaluation perspectives

In line with previous two issues, four Web site evaluation perspectives are identified. They are named Organisation Provider, Customer Provider, Organisation User Perspective, and Customer User perspective (see Figure 2.4).

Figure 2.4 *Four Web site evaluation perspectives*

	Adding value to organisation	**Adding value to customer**
Provider as Evaluator	Organisation Provider perspective	Customer Provider perspective
User as Evaluator	Organisation User perspective	Customer User perspective

When adopting the Organisation Provider perspective, the evaluation of Web sites is conducted by the provider to seek how the Web site can add value to the organisation. The value is the purposes that the Web team received from the management for developing the Web site that are achieved (Widmer & Shepherd, 1999). The most popular study from this perspective is measuring the performance of Web site. The performance can be measured ranging from the amount of work a Web site can process in a given amount of time, to return on investment (ROI), and cost reduction (Jones & Kayworth, 2002). Some companies monitor the performance of their Web sites through Web trend report, monitoring cost, the number of visitors, how long the visit is, where visitors go on the site, and where they came from (Jones & Kayworth, 1999). Other issues in this perspective include: Web Customer Relationship Management (CRM) and Web marketing.

When adopting the Customer Provider perspective, the evaluation of Web sites is conducted by the provider to discover how the Web site can add value to the

customer. Since the provider is not the customer, how the Web site can actually add value to the customer is based on what value the provider believes the Web site can add to its customers. The evaluation made from this perspective is based on evaluating the content (Chalmers et al., 1998; Huizingh, 2000), quality (e.g. Cox & Dale, 2002; Day, 1997; Dran, Zhang, & Small, 1999; Loiacono, 1999; Mich et al., 2003; Olsina, Godoy, Lafuente, & Rossi, 1999; Rettig & LaGuardia, 1999), and design (e.g. Gehrke & Turban, 1999; Shneiderman, 1997; Thelwall, 2003; Wan & Chung, 1998) of the Web site, and some particular evaluation guidelines (Gehrke & Turban, 1999; Rettig & LaGuardia, 1999). The provider can also conduct usability studies involved with non-customers to simulate a superior Web design which can add value to the customer. For example, Go, Takahashi, and Imamiya (2000) asked current students to conduct a role play for prospective students in order to understand how the Web site adds value to the prospective customer.

When adopting the Organisation User perspective, the evaluation of Web sites is conducted by the user discovering how the Web site can add value to the organisation. The user mentioned here can be internal (e.g. the organisation's staff) or external (e.g. the buyers) to the organisation. Because the internal user belongs to the organisation, the purpose of utilising the Web site is to conduct the internal operations of the organisation. The major issue concerning the internal user is how the Web site can add value to the internal operations of the organisation which provides the Web site. In contrast, the external user cannot realise the value to the organisation because they are external to the organisation. Thus, there is little intention to employ the external user to evaluate the Web site and seek how the Web site can add value to the organisation.

When adopting the Customer User perspective, the evaluation of Web sites is conducted by the user seeking how the Web site can add value to the customer. Again, the user can be the internal or external user. However, the internal user belongs to the organisation. They can hardly realise the value to the customer. Thus, the user employed by this perspective is more likely to be the external user.

During the evaluation, the central focus of the external user is customer satisfaction which means how the Web site can meet the needs and satisfy the preferences of the customers (Cunliffe, 2000). Thus, there is a need to build a great customer experience before, during, and after their use of the Web site, which is likely

to lead to future visits by the customer and long-term loyalty for the site (Berthon, Pitt, Ewing, Jayaratna, & Ramaseshan, 2001; Cunliffe, 2000; Griffiths et al., 2001). Undertaking a usability study with an actual customer involved is also a popular approach in this perspective (e.g. Agarwal & Venkatesh, 2002; Konradt et al., 2003; Nielsen, 1995; Palmer, 2002). For example, Nielsen (1993; 1995) provided guidelines and criteria to evaluate the usability of Web site design and suggested that every Web site development should be subjected to usability testing. However, it is important to bear in mind that the usability studies discussed here are different from the usability studies discussed in the Customer Provider perspective. The evaluator involved is the actual customer while the evaluator involved when adopting the Customer Provider perspective is not.

The Organisation Provider perspective is appropriate for the Web site evaluation in this research. This is because one of the purposes of this research is to evaluate how well the Web site supports OCAs (see the third research question in Section 1.2). The OCAs are those activities conducted by the organisation that provides the Web site. When the Web site supports OCAs, it is adding value to the organisation. Furthermore, another purpose of this research is to identify the method which can be used by the Web site provider to measure and improve their Web site (see the fourth research question in Section 1.2). The provider should be the evaluator. Thus, the evaluation perspective of this research is the Organisation Provider perspective.

2.3.4 Searching for proper evaluation criteria

This section will discuss what evaluation criteria are proper for the Web site evaluation in this research when the Organisation Provider perspective is adopted. There are two important clarifications made here about the evaluation criteria.

Firstly, the Organisation Provider perspective does not focus on the user-centred criteria as the user-centred criteria are usually chosen by the users (Herrera-Viedma et al., 2003). Thus, criteria, such as ease of use or quality, are not appropriate to this research.

Secondly, this research considers “thoroughness” rather than “exhaustiveness” when selecting the Web site evaluation criteria. As Hix and Schulman (1991) suggested, thoroughness rather than exhaustiveness should be considered in the

evaluation methodology on the human-computer interface. In other words, the chosen criteria are "critical" rather than "comprehensive" to the Web site evaluation. In regard to these clarifications, the Web site evaluation criteria chosen for this research must be appropriate to evaluate how well the Web site supports OCAs and be organisational and provider-oriented, and chosen based on a thorough consideration.

2.3.4.1 Two kinds of value – efficiency and effectiveness

Efficiency and effectiveness are two kinds of value which the IS can provide to organisations in terms of adding value to the organisation (Andreu et al., 1992; Bakos & Treacy, 1986; Edwards et al., 1995; Pant & Hsu, 1996). For example, Bakos and Treacy (1986) found that IT supports competitive strategy by improving operational efficiency and functional effectiveness. Efficiency includes cutting costs (Byrd & Turner, 2001; Damanpour & Madison, 2001; Pant & Hsu, 1996; Strauss & Frost, 2001) and timelessness (Damanpour & Madison, 2001). Effectiveness includes sales increase and customer retention (Strauss & Frost, 2001). Studies also found that organisations utilise IS/IT to support organisational activities in order to create efficiency and effectiveness. For example, Edwards, Ward, and Bytheway (1995) suggested that the IS has impacts on the activities in value chain in terms of efficiency and effectiveness. Andreu, Ricart, and Valor (1992) also argued that the IT can be used as a support tool in order to upgrade the efficacy and efficiency of organisations' activities.

These two kinds of value are also discussed in the Web site studies which revealed that a Web site, as a type of IT, is utilised by organisations to achieve efficiency and effectiveness (Chandrasekaran, Miller, Silver, Arpinar, & Sheth, 2003; Lederer et al., 1997; Riggins, 1999). In terms of supporting organisational activities, the Web site also helps organisations increase the efficiency and effectiveness of their activities (Strauss & Frost, 2001). Ellinger, Lynch, and Hansen (2003) suggested that adopting Web sites enables organisations to transform traditional transactional activities in a more efficient and effective fashion. In line with these findings, the efficiency and effectiveness are two kinds of value which should be discussed when evaluating how well the Web site supports OCAs. Thus, "how well" should be measured by "how effectively" and "how efficiently".

2.3.4.2 Two evaluation criteria – informativeness and interactivity

In line with previous discussion, this research identifies two appropriate criteria for evaluating how effectively and how efficiently the Web site supports OCAs – informativeness and interactivity.

Based on the definition given by Bhatt and Emdad (2001), this research defines informativeness as the amount of information that flows between the user and the Web site when conducting the OCA. This criterion is used to measure how effectively the Web site supports OCAs. Based on the definitions given by Dann and Dann (2001) and Lane and Cavaye (1999), this research defines interactivity as the extent of the interactive nature of the Web site which allows the user to control the dialogue for transferring of information in order to conduct the OCA. This criterion is used to measure how efficiently the Web site supports OCAs. However, interactivity should be differentiated from functionality. Functionality is the extent that the Web site enhances the quality of users' work by providing the features desired by users (Byrd & Turner, 2001; Sethi & King, 1994).

The importance of these two criteria in the evaluation of Web site from a organisation's perspective can be seen in the study of Ellinger et al. (2003). They conducted an empirical study which examined the Top 100 U.S. motor carrier firms' Web sites. The results showed that informational and interactive content of the Web sites are positively associated with firms' financial performance.

A number of studies also have confirmed that the support made to organisational activities from Web sites includes information and interaction (e.g. Angehrn & Meyer, 1997; Axelsson, 2003; Bhatt & Emdad, 2001; Chen, Haney, Pandzik, Spigarelli, & Jesseman, 2003; Ellinger et al., 2003; Hoey, 1998; Kollmann, 2000; Kuo, Hwang, & Wang, 2004; Mirani & Lederer, 1998; Palmer & Griffith, 1998b; Quelch & Klein, 1996; Rayport & Sviokla, 1995). This interaction includes transaction and communication (Angehrn, 1997; Axelsson, 2003; Wen et al., 2001), and distribution (Angehrn, 1997). Abrahao, Olsina, and Pastor (2003) also described these two dimensions as non-functional (the information) and functional (the interaction) aspects of Web sites. By providing more informational content which is required to conduct an OCA, the Web site can support the OCA more effectively. By providing more sophisticated transactional, communicational, and distributional features which are required to conduct an OCA, the Web site can support the OCA

more efficiently. Informativeness and interactivity are proper criteria to measure how effectively and efficiently the Web site supports the OCA.

2.3.4.3 Two aspects of evaluating informativeness

Evaluating informativeness in this research has to be concerned with two aspects. The first aspect is the amount of the information needed in supporting an OCA. This is borrowed from the measurement principle of information intensity of a service (Lane & Cavaye, 1999; Porter & Millar, 1985), which refers to the amount of information that goes into the development of the service, and the amount of information required by consumers to utilise the service. Therefore, the informativeness of a Web site in supporting an OCA can be measured by the amount of information required to develop the activity, and utilised by users to conduct the activity.

The second aspect is the relevance of the information (Fitzgerald & Galloway, 2001; Herrera-Viedma et al., 2003; Wang & Soergel, 1999). As discussed previously, informativeness is used to evaluate how effectively the Web site supports OCAs. Pyburn (1983) suggested that how effectively the IS supports the organisation is measured by how the IS is perceived to support the critical needs of the organisation. In other words, it is important to assess the relevance of the piece of information in addressing the needs of conducting the OCA. Thus, relevance should be a concern when evaluating how informatively Web sites support OCAs.

Relevance is judged by a person in consideration of the relationship between a need and a document (Fitzgerald & Galloway, 2001; Wang & Soergel, 1999). Depending on whether it is being judged by human or system, the relevance can be subjective/personal or objective/public relevance (Fitzgerald & Galloway, 2001). To deal with objective relevance, individuals seek information, and translate an information need into a query, which is interpreted in an objective fashion by the information systems. Fitzgerald & Galloway (2001) suggested that if the goal is to describe and understand how people make judgments under different conditions, the personal/subjective relevance should be concentrated on. Under such circumstances, the objective relevance may not correspond closely to the subjective relevance of the user.

2.3.4.4 Two approaches to evaluating interactivity

There are two approaches to evaluating the interactivity of Web sites. They are termed interaction level (Bakry & Bakry, 2001; Hamilton & Selen, 2003; Kollmann, 2000; Lane & Cavaye, 2000; McCarthy & Aronson, 2000; Nel, Niekerk, Berthon, & Davies, 1999; Scharl, Gebauer, & Bauer, 2001; Smith, 2001; Teubner & Klein, 1998) and feature level (Karakaya & Khalil, 2004; Quelch & Klein, 1996; Ramsey, Ibbotson, Bell, & Gray, 2003) in this research.

The interaction level approach sets the levels of interactivity from an overall perspective. For example, McCarthy and Aronson (2000) classified e-commerce Web sites into four levels according to their ability to support e-commerce transactions: introductory (e.g. introducing products and services), informative (e.g. providing transactions and order information), interactive (e.g. immediate feedback), and intelligence (e.g. intelligent agents to build and maintain customer profiles, personalised response to consumers). Bakry and Bakry (2001) also suggested that the Web site in supporting e-business can be categorised into three levels: supports intra-organisational transactions at the intranet level; supports inter-organisational transactions and associated individuals at the extranet level; and supports public organisational transactions between the organisation and other parties (organisation or individuals) at the Internet level.

When adopting the interaction level approach, many studies have set the levels of the interactivity of Web sites as static, dynamic, and transactional (Hamilton & Selen, 2003; Kollmann, 2000; Lane & Cavaye, 2000; Nel et al., 1999; Scharl et al., 2001; Smith, 2001; Teubner & Klein, 1998). The static level is the one-way flow of information (Marcella, 2002). The interactivity of the Web site, which belongs to this level, only presents static information. The user cannot send any information to the Web site provider through the Web site. The dynamic level is that the Web site enables a two-way flow of information (Marcella, 2002) and provides personalisation and feedback features (Hamilton & Selen, 2003; Lane & Cavaye, 2000). The transactional level is that the Web site provides real-time communication (Hamilton & Selen, 2003; Lane & Cavaye, 2000) and real-time transaction (Kollmann, 2000; Peters, 1998) to the users.

The feature level approach identifies the levels of interactivity based on the features on the Web site (Karakaya & Khalil, 2004; Quelch & Klein, 1996; Ramsey et

al., 2003). For example, Quelch and Klein (1996) identified five levels of Web sites: the first level provides image/product information; the second provides market research information; the third provides customer support functions; the fourth provides internal support and service; and the fifth enables transaction. Lockett and Brown (2001) also identified five levels to the feature level approach. The Web site which enables supply chain and customer relation management initiatives is ranked as very high; the one ranked as high supports financial information, vertical applications, and e-marketplaces. The medium level of Web site enables buying and selling on-line, and is linked by the extranet. The Web site belonging to the low level can be accessed through the intranet; and, the Web site which only provides email is ranked as very low.

The feature level approach is less applicable to various kinds of Web environment in comparison with the interaction level approach. This is because the feature level approach is based on the features on the Web site when judging the levels of interactivity. However, the sophistication of Web technologies is evolving (Scharl & Brandtweiner, 1998). Thus, one approach developed four years ago may not be applicable to evaluate the current Web site because some of the latest Web features may not be recognised by the approach. In contrast, the interaction level approach identifies the level of interactivity from an overall perspective. It is more flexible and leaves room for adding new features which belong to the levels. Thus, this approach is considered as more applicable to various kinds of Web sites. For these reasons, this research adopts the interaction level approach to measure the interactivity of Web sites in supporting OCAs.

2.3.5 Searching for proper evaluation methodologies

This section will discuss what evaluation methodologies are available, and which one is more appropriate for the Web site evaluation when the evaluation perspective is from that of the Organisation Provider. However, it is important to note that the methodologies reviewed in this section represent the answer to the research questions given from the literature. They are not the exact evaluation methodologies used by this research, which will be discussed in Chapter 3.

Sudweeks and Simoff (1999) suggested that the Web site researcher should consider two issues when developing their own methodologies to evaluate Web sites:

whether the data is qualitative or quantitative, and whether the analysis method is qualitative or quantitative. This research accepts this suggestion and also suggests a third issue: whether the data collection approach is manual or automated. The following sub-sections will discuss these three issues and make appropriate choices for this research.

2.3.5.1 Issue 1 – qualitative or quantitative data

It is widely accepted that the data to be analysed in a research project can be either qualitative or quantitative (Zikmund, 1997). For example, the interview transcription is a type of qualitative data, whereas the numbers stated in the statistical reports belong to quantitative data. However, the discussion of the data types in the evaluation of Web site is more complicated. The reason is that the Web site itself can be considered as either "the data" or "the respondent".

When treating the Web site as the data, the qualitative content of the Web site is qualitative data, and the numeric content is quantitative data. In contrast, when considering the Web site as the respondent, the data is not simply the content of the Web sites. The Web evaluator needs to analyse the content first in order to generate the data. This is the same principle as with utilising the interview method to collect data from the interviewee. The interviewee is not the data, but what he or she has revealed in the interview is. Thus, the Web content is not the data when considering the Web site as the respondent. Based on this clarification, for example, counting the hyperlinks on Web pages generates the quantitative data (e.g. Thelwall, 2002) while analysing the strategic importance of some text on the Homepage produces qualitative data (e.g. White & Raman, 1999).

This thesis has made a distinction here. When treating the Web site as the data, the data to be analysed is termed as "raw data". When treating the Web site as the respondent, the data to be analysed is "processed data". Then, the analysis conducted on the raw data is termed "raw data analysis" while the analysis conducted on the processed data is termed "processed data analysis". Figure 2.5 (see next page) shows their relationships.

Figure 2.5 *Relationships between two types of data and analysis on Web sites*

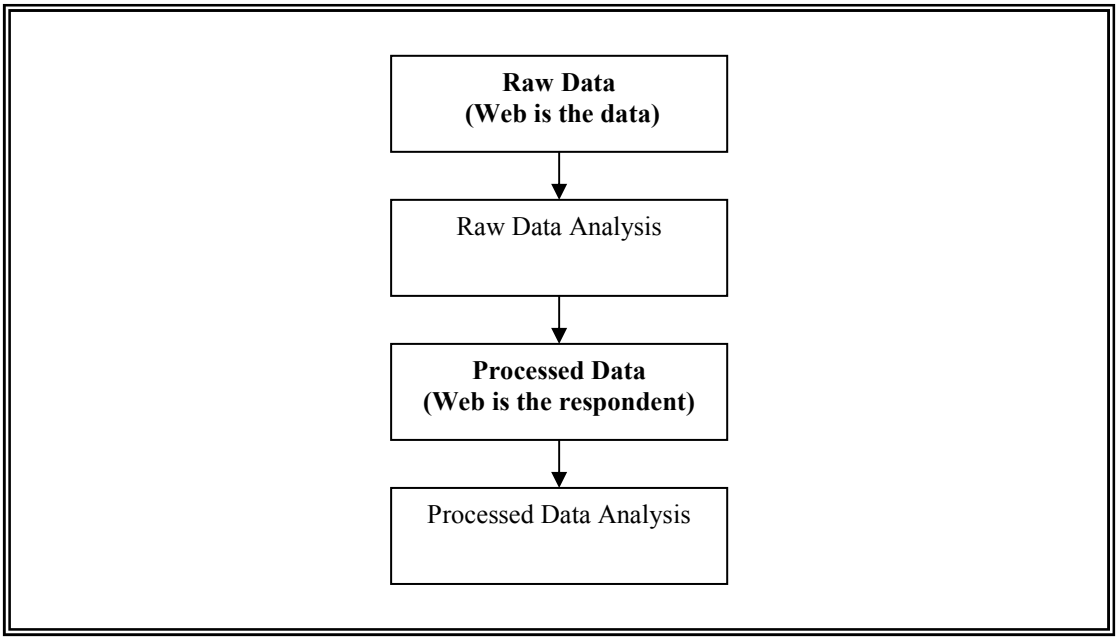


Figure 2.5 shows that the Web site itself is the "raw data". Then, the raw data analysis will be conducted in order to produce "processed data". The processed data will be further analysed and interpreted by the processed data analysis. Since the raw data of this research is the content of the Web site, if the content analysed is numeric, the raw data is quantitative data. If the content analysed is the qualitative text or feature, the raw data is qualitative data. According to Section 2.3.4, this research is concerned with evaluating the qualitative text and features. Thus, the raw data of this research is qualitative data.

In regard to the processed data, whether it is the qualitative or quantitative data depends on how the raw data analysis generates the processed data. As discussed in Section 2.3.4, the raw data analysis adopted by this research is based on the evaluation of the informativeness and interactivity on the Web site. The informativeness evaluates the amount of relevant information (e.g. the information on two sub-sites or three paragraphs of text on a Web page) whereas the interactivity evaluates how interactive the Web site is (e.g. the number of interactive features on the Web site or the level of interactivity of the Web site). Thus, the processed data produced by these two measures are numeric, and considered as quantitative data.

2.3.5.2 Issue 2 – qualitative or quantitative analysis method

The Web analysis can be qualitative and quantitative (Atzeni et al., 2002; Bauer & Scharl, 2000; Sudweeks & Simoff, 1999). These differ in their approach to the problem (Sudweeks & Simoff, 1999).

Atzeni, Merialdo, and Sindoni (2002) described qualitative analysis as "General Analysis" which deals with the overall features of the site and aims at providing a succinct yet complete snapshot of the site. They believed that this approach is more appropriate for evaluating the Web sites in relation to the objectives and services (Atzeni et al., 2002). Sudweeks and Simoff (1999) suggested that the qualitative approach is centred on the qualitative characteristics of the phenomenon and tries to grasp the form, the content, and some constraints of the investigated phenomenon and analyse its qualities. Thus, it provides better analysis of the observed phenomena, and deeper interpretation of the issues in the content of the Web site.

The quantitative approach is associated with numeric evaluation (Atzeni et al., 2002) and tries to quantify every detail (Sudweeks & Simoff, 1999). Atzeni, Merialdo, and Sindoni (2002) described this approach as "Specific Analysis". The quantitative analysis of Web site research is widely recognised as providing a static view of data, the frequency of the features, and whether each feature is present or not (Sudweeks & Simoff, 1999). It assumes that collected data are measurable, or if they are not, it is necessary to design an experiment or computer simulation in a way that respective measurements can be taken (Sudweeks & Simoff, 1999).

This research employs a method to distinguish whether the Web analysis is a qualitative or quantitative approach, that is, to differentiate whether the processed data is qualitative or quantitative. As discussed previously, the type of the processed data depends on the type of Web analysis approach used to generate the processed data. In other words, the qualitative analysis generates qualitative processed data whereas the quantitative analysis generates quantitative processed data. Thus, the type of the Web analysis can be understood by the type of processed data being produced by the analysis.

The differences between these two approaches can be illustrated by criteria based analysis and content analysis. Criteria based analysis provides a list of qualitative criteria which allows an analysis or comparison of the Web site in order to generate qualitative processed data (e.g. Kirkwood, 1998). However, criteria based

analysis can be also treated as quantitative analysis, again, depending on the processed data being produced. For example, Olsina et al. (1999) incorporated a series of rating scales into the criteria during their Web site evaluation. The processed data was purely quantitative. This criteria based analysis belongs to quantitative approach.

Content analysis is mostly used in quantitative analysis of Web sites (Sudweeks & Simoff, 1999). The use of content analysis allowed a systematic and objective method for capturing specific characteristics of media (Palmer & Griffith, 1998a). It requires the researcher to generate a list of variables, codes, and rules of codes. Then, the Web site is analysed in terms of the frequencies of the features which are coded by the codes (Ju-Pak, 1999; Kelly & Turley, 1997; McMillan, 2000; Sudweeks & Simoff, 1999). Because the processed data produced is quantitative, it is categorised as a quantitative analysis in this research.

As discussed previously, the raw data of this research is qualitative whereas the processed data of this research is quantitative. Thus, the qualitative analysis is chosen for the analysis of the raw data while the quantitative analysis is chosen for the analysis of the processed data.

2.3.5.3 Issue 3 – manual or automated data collection approach

There are two approaches to data collection, automated and manual (Bauer & Scharl, 2000; Clausen, 1999). The data collection approach discussed here is the raw data analysis mentioned in the previous section. The automated approach employs software or a computer programme to analyse the Web site automatically. From one extreme in this approach, some software packages can analyse the Web site and generate a report automatically, such as the software called "Doctor HTML" (Clausen, 1999). From the other extreme in this approach, the software only generates data. The analysis of the data still needs human judgment, such as content analysis software (Kelly & Turley, 1997).

In comparison, the utilising of content analysis software is the most popular option in the automated approach in the Web site studies (e.g. Bauer & Scharl, 2000; McMillan, 2000; Perry & Bodkin, 2000; Perry & Bodkin, 2002) due to the concerns of a lower cost and higher efficiency. It has been used particularly to study message content and has flourished in a variety of advertising contexts since Kassarjian (Kelly & Turley, 1997) introduced the technique.

The manual approach employs one or more evaluators to analyse the Web site. This approach has been adopted frequently in the evaluation and development of human computer interface (e.g. Hix & Schulman, 1991). Concerning the Web site studies, there is also a large body of literature adopting this approach, for example, the usability studies (e.g. Garcia, Sicilia, Gonzalez, & Hilera, 2003; Nielsen, 1995; Palmer, 2002; Sing, 2004), and the design of e-commerce Web sites (e.g. Kuo et al., 2004; Magal, Feng, & Essex, 2001; Wan & Chung, 1998). The evaluator is given a list of criteria (e.g. Ho, 1996), tasks (e.g. Hung & McQueen, 2004), or a combination of these (e.g. Garcia et al., 2003), together with the guidelines leading the evaluator to browse the content and operate the features of the Web site. Then, the evaluator is required to generate the results of the evaluation.

In comparison, the automated approach enables the evaluator to deal with a large number of Web sites and Web pages efficiently, particularly when identifying the frequencies of features, key words, or phrases. However, this approach may be weaker in addressing the issue of effectiveness, such as ranking the level of satisfaction or the interpreting the phrases. This is because dealing with these issues needs the involvement of human judgment.

The manual approach is appropriate for this research. This is because the evaluation of the criterion of informativeness requires human judgment on the relevancy of the information and the manual approach provides the opportunity for this. In addition, Web technologies are advancing fast, which means that the automated software would be unable to diagnose some of the latest and interactive features in the Web sites when evaluating the interactivity.

2.3.5.4 Overcoming the difficulty when adopting manual approach

Since the numbers of Web pages of most Web sites have grown enormously, Thelwall (2003) noted that identifying all relevant pages manually can be a very labour-intensive process for these gigantic Web sites. Thus, the difficulty is how to evaluate the enormous amount of Web pages manually and efficiently. There are two solutions found in the literature to deal with this.

Firstly, it is important to focus on the topic in the aggregated Web pages in the Web site evaluation. Thelwall (2003) suggested shifting the focus from individual pages to aggregated. The aggregation of Web pages can be based on the “topic” and

"community". The term "topic" refers to a set of pages on the Web site that share a common theme. A topic can be typically identified by a combination of text analysis and link structures. In contrast, the "communities" are identified by link structures alone. For example, Gillenson, Sherrell, and Chen (2000) studied the structures on 300 Web sites. Some of the Web sites included in their study contained literally thousands of distinct pages and many more thousands of links. They did not review each page and link in these Web sites. Instead, they reviewed groups of Web pages and links because they believed that the evaluation of the classified Web pages also provides a significant step forward for people in achieving the state-of-the-art Web design.

Secondly, it is helpful to employ evaluation guidelines and forms to help the evaluator assess the Web site. Garcia, Sicilia, Gonzalez, and Hilera (2003) found that one of the problems which happened very often when evaluating the Web site manually is that the evaluator had never used the Web site before. Thus, providing guidelines in the evaluation process is helpful. Hung and McQueen (2004) and Go, Takahashi, and Imamiya (2000) confirmed that providing guidelines helped evaluators to evaluate Web sites. Another way is to provide evaluation forms. Hix and Schulman (1991) suggested that the evaluation forms provide a structured, consistent instrument for evaluating and comparing tools (the thing they are evaluating), as well as presenting results of those evaluations. Many studies have provided evaluation forms to assist evaluators in evaluating the Web site efficiently and effectively (e.g. Escalas et al., 2001; Hung & McQueen, 2004; Kuo et al., 2004). Adopting the guidelines and evaluation forms provides the evaluator a structured and consistent way to analyse the "new" Web environment.

2.4 Overall Support Discussion

This section will search the literature for the answer to the fourth research question: How can the overall support made to an organisation's OCAs from their Web site be discussed? How can the results be translated into useful suggestions to improve the Web site and what framework and method can be used?

Previous sections have reviewed the literature relating to the notion of OCAs, possible methods for eliciting OCAs, and the methods which can be utilised to evaluate how effectively and efficiently Web sites support each OCA. By utilising these methods, a list of OCAs nominated by management can be generated, and how the Web sites support each of the OCAs can also be discussed. This section will discuss the way to discuss the overall support made to OCAs from Web sites based on the results both produced from the semi-structure interviews with management and the manual Web site evaluations.

The way used to discuss the overall support in this thesis can be considered as a specific type of IS alignment. Thus, it is based on the perspective and approach utilised in the IS alignment. Section 2.4.1 will explain why the overall support discussed in this thesis can be considered as a specific type of IS alignment and what dimensions of IS alignment this thesis falls into. Section 2.4.2 will discuss the appropriate IS alignment perspective which this thesis can adopt to discuss the overall support and how the results can be translated into useful suggestions to improve the Web site.

2.4.1 Overall support is a specific type of IS alignment

The overall support discussed in this thesis can be considered as a specific type of IS alignment. Alignment is a complex concept (Papp, 1998). Various kinds of definitions of alignment have been found in the IS literature. For example, Burdett (1994) considered alignment as an arrangement of groups or forces in relation to one another. Weill and Broadbent (1998) defined the alignment of organisational and information strategies as the extent to which the organisational strategies were enabled, supported, and simulated by information strategies, while Chorn (1991) defined alignment in a broader context as the "appropriateness" of the various elements to one another.

In addition to various definitions, various terms are used interchangeably to describe alignment. The concept of alignment can be seen in the studies using words such as "fit" (Chorn, 1991; Doty, Glick, & Huber, 1993; Miles & Snow, 1994), "link" (Insinga & Werle, 2000; Kaplan & Norton, 1996; Pyburn, 1983; Tan, 1994), congruence (Karimi, Gupta, & Somers, 1996) or "match" (Scharl et al., 2001). Venkatraman (1989a) suggested that different terms, such as congruence, fit, and alignment should be accompanied by descriptive guidelines.

Since IS alignment is such a complex concept, the following sub-sections will use three issues to clarify the types of alignment, and then discuss what types of alignment the overall support discussed in this thesis is. These three issues are the number of constructs, the relationship between constructs, and the alignment dimensions.

2.4.1.1 Issue 1 – number of constructs

The first issue is the number of constructs involved in the IS alignment discussion. The study of alignment must have the elements to be aligned, which are called "constructs". The numbers of constructs are various in the IS alignment area. For example, Henderson and Venkatraman (1993) proposed an alignment model called "strategic alignment model" which includes four constructs: business strategies, IS strategies, business structures, and IS structures. Some studies identified three constructs, such as organisation structures, organisation process, and organisation strategy (Cowherd, 1988). Burdett (1994) studied the alignment among three constructs which were customers, organisation, and team.

Studying two constructs is most frequently seen in the IS alignment (e.g. Beal & Yasai-Ardekani, 2000; Chan, 1999; Chan, 2002; Ellis & Griffith, 1998; Karimi et al., 1996; Kathuria & Porth, 2003; Kerr & Jackofsky, 1989; Luo & Park, 2001; Nickerson, Eng, & Ho, 2001; Sun & Hong, 2002; Teo & King, 1996). For example, Luo and Park (2001) studied the alignment between organisational typologies with the market in China. Sun and Hong (2002) focused on the alignment between manufacturing and organisational strategies. Teo and King (1996) researched the alignment between business planning (BP) and information systems planning (ISP). Ellis and Griffith (1998) examined linking EDI implementation with organisational strategy. Beal and Yasai-Ardekani (2000) were interested in aligning CEO functional experiences with organisational strategy. Since this research concerns the support made between two constructs – OCAs and Web sites, the overall support discussed in this research can be considered as a "two-construct IS alignment".

2.4.1.2 Issue 2 – relationship between constructs

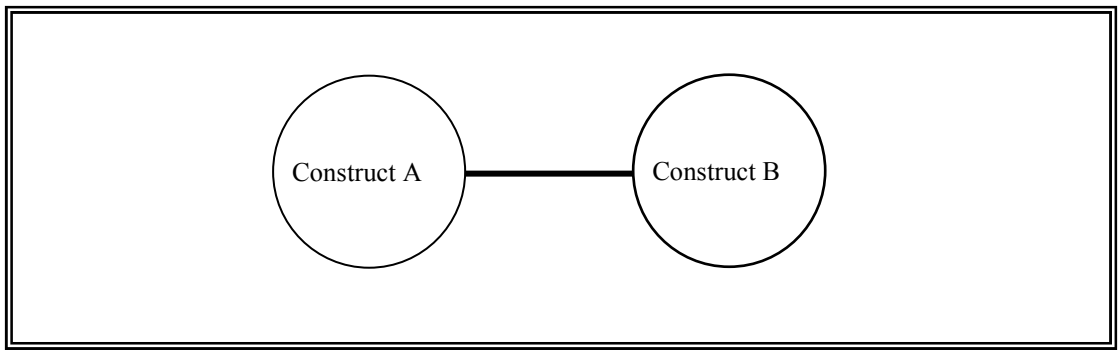
Following from the first issue, the second issue is the relationship between constructs. Van de Ven (1979) suggested that the alignment can be induced with or without

causation between the constructs. This shows that the alignment of two constructs can be with or without causation.

Relationship without causation

The relationship without causation between two constructs means that no causation is found between two constructs or the causation is disregarded. This type of relationship can be illustrated by Figure 2. 6.

Figure 2.6 *No causation between two constructs*



Van de Ven (1979) reviewed the theory of population ecology which was being applied to the relationship between organisation and environment (e.g. Chorn, 1991; Egelhoff, 1982). The findings showed that it was possible that there was no causation implied between environment and organisation structure. The reasons for no causation existing between the constructs are that the two constructs (organisations and the environment) are part of a social system. Thus, the alignment is an interaction effect of organisational environment and structure on organisational survival.

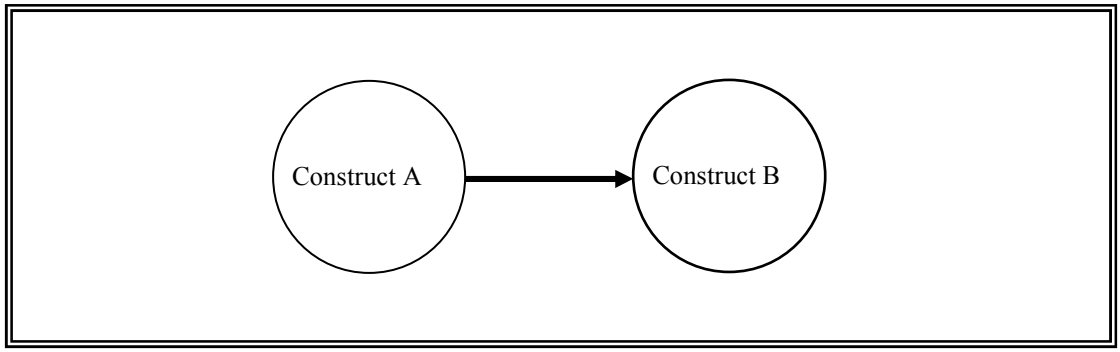
Another meaning, as suggested by Van de Ven (1979), tends to disregard the causation existing between organisations and the environment. This meaning is that the alignment between organisational environment and structure may simply be a spurious result of a third set of factors that explain the observed covariations among environment and structure. For example, Broadbent and Weill (1991) identified six indicators which were important in aligning organisational and information strategy in the banks. For this group of studies, the relationship between the constructs is not the focus, and can be disregarded.

Relationship with causation

The relationship between two constructs can be considered with causation. As Van de Ven (1979) suggested, an organisation must adapt to the characteristics of its environment if it is to survive or to be effective. This perspective shows a clear deterministic theme derived from the environment causes of the organisation's structure which must be in place if the organisation is to survive (Van de Ven, 1979). For this reason, the causation does exist between the two constructs.

The causation which exists between two constructs has been widely recognised by the IS researchers (Henderson & Venkatraman, 1993; Kearns & Lederer, 2000; Tallon & Kraemer, 1998; Vitale, Ives, & Beath, 1986). Henderson and Venkatraman (1993) revealed that each of the four constructs in their strategic alignment model can be the driver and has the driving force to influence to the other constructs. This is termed "one-way alignment" in this research. This type of relationship can be illustrated by Figure 2.7.

Figure 2.7 *Relationship with causation – the one-way alignment*

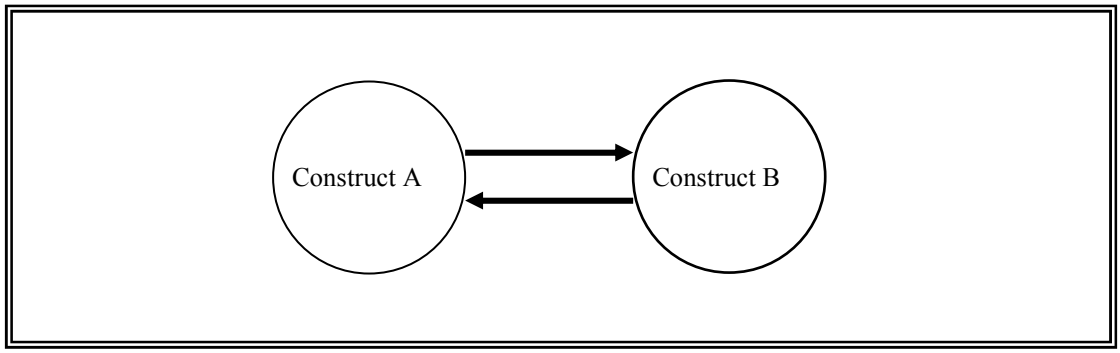


One-way alignment means that the construct B should be aligned with the construct A. The construct A has the driving force, and is the driver in the alignment model. As construct A has the driving force, construct B should support construct A.

A number of IS alignment studies are based on this relationship. For example, Pyburn (1983) tried to link the MIS plan with organisational strategy. Tavakolian (1989) linked the information technology structure with organisational competitive strategy. Venkatraman and Camillus (1984) studied aligning those external issues of the organisation (e.g. environmental factors, competitive responses) and internal issues (e.g. internal structures, management processes) with organisational strategy.

However, many IS researchers have called for investigating two way relationships between the constructs (e.g. Baets, 1992; Kearns & Lederer, 2000; Luftman, 2000; Tallon & Kraemer, 1998; Vitale et al., 1986). The "two way relationship between the constructs" means both of the constructs are the drivers. This is termed "two-way alignment" in this research. The causation between the two constructs can be illustrated as Figure 2.8.

Figure 2.8 *Relationship with causation – the two-way alignment*



For example, Vitale et al. (1986) found there are two views to ensure that the IT is appropriately linked to organisational strategy: the top down, and adaptive models. The top down model requires the organisation to adjust its infrastructure of IT to the requirements of the strategy. In contrast, the adaptive model requires the organisation to develop strategy incorporating the organisational capabilities and resources. Baets (1992) also suggested not only attempting to align IS strategy into organisational strategy, but defining them in parallel. Tallon and Kraemer (1998) define strategic alignment as the extent to which the IS strategy supports, and is supported by, the organisational strategy. Thus, organisational strategy capitalises on technology and also technology supports organisational strategy. Luftman (2000) argued that alignment addresses both how IT is in harmony with the organisation, and how the organisation should, or could, be in harmony with IT.

Kearns and Lederer (2000) argued that aligning an IS plan (ISP) with a business plan (BP) is different from aligning a business plan (BP) with an IS plan. In other words, the BS-ISP (BS is aligned with ISP) alignment is different from the ISP-BP (ISP is aligned with BP) alignment. They studied the differences between these two types of alignment. They argued that these two types of alignment provide benefits to businesses in different aspects. The BS-ISP alignment is important because

it ensures that the business plan reflects the experience and knowledge of the organisation in utilising IS-based resources, increases organisational understanding of information technology and agreement between managers on how best to use IT, and signifies better top management understanding and greater top management commitment. In contrast, the ISP-BP alignment is also important because it signifies IS management's understanding of business strategy. However, it does not ensure that the business plan reflects the experience and knowledge of the organisation, and organisation may ignore the strategic potential of information technology in the execution of their plans (Kearns & Lederer, 2000).

This overall support discussed in this thesis focuses on evaluating the overall support made to OCAs from Web sites. There is a clear deterministic theme derived from this purpose. Thus, the causation is existing in the relationship between the two constructs. It is how to align the Web site with OCAs. Thus, the overall support discussed in this thesis is a one-way alignment. Another type of causation, which is how the OCAs can be aligned with Web sites, will not be covered here as it is not the focus of this research.

2.4.1.3 Issue 3 – alignment dimensions

The third issue is the alignment dimensions utilised to clarify the concept of alignment. Various classification frameworks have been proposed to discuss the alignment dimensions (Itami & Numagami, 1992; Nakayama, 2001; Reich & Benbasat, 1996; Sethi & King, 1994; Tan, 1999; Thomas & Dewitt, 1996). The following sub-sections of this section will firstly discuss the alignment dimensions which are relevant to this research. These include the cause and effect, the social and intellectual, the behavioural and cognitive, and the current and future dimensions. Then, it will discuss what alignment dimensions the overall support discussed in this thesis are.

Cause and effect

Reich and Benbasat (1996) suggested two dimensions for measuring alignment: cause and effect. The effect dimension is the result or outcome produced from the alignment (Sethi & King, 1994; Venkatraman, 1989b). It has various meanings to the organisation, such as coordinated functional documents with the strategic plans

(Venkatraman & Camillus, 1984), shared understandings between different levels of management, aligned behaviour of the management or aligned management thinking (Reich & Benbasat, 1996; Tan, 1999; Venkatraman & Camillus, 1984). However, the evaluation on the effect dimension is of little help in understanding "how" (Sethi & King, 1994).

In contrast, the cause dimension focuses on understanding and measuring the means to achieve the outcome (Sethi & King, 1994; Venkatraman, 1989b). This can be the explanations of the alignment (Thomas & Dewitt, 1996), the process to achieve the alignment (Tan, 1999; Venkatraman & Camillus, 1984) or the factors which cause the alignment (Luftman, Papp, & Brier, 1999).

Social and intellectual

In addition to cause and effect dimensions, Reich and Benbasat (1996) also suggested social and intellectual dimensions for measuring alignment. The social dimension emphasises the people's profile and ability, degree of involvement and social factors in determination of alignment (Horovitz, 1984; Reich & Benbasat, 1996). It is the "personnel linkage" described in Lederer and Mendelow's (1989) study, the "organisational linkage" described in Shank, Niblock, and Sandalls' (1973) study and the "subjective alignment" mentioned in Ball, Adams, and Xia's (2003) study. The social dimension focuses on measuring the units that are responsible for developing the constructs. For example, whether the agreements between the IS executive and general executives on the IS are coordinated (Ball et al., 2003). Thus, social alignment means that the units, personnel, and social factors which are responsible and involved in the development of the constructs are aligned.

The intellectual dimension is the methodologies and tools which can be aligned or which can help a decisionmaker utilise the best way to formulate the alignment (Horovitz, 1984; Reich & Benbasat, 1996). This is the "content linkage" described in Shank, Niblock, and Sandalls' (1973) study, and "objective alignment" mentioned in Ball, Adams, and Xia's (2003) study, which deals with the correspondence between the content of two constructs. For example, the data presented in the plan document and that presented in the budget are aligned (Shank et al., 1973); and the IS strategy and organisational strategy are aligned. Thus, the

intellectual alignment means that these methodologies and tools are aligned or these methodologies and tools utilised by decisionmakers are aligned.

Behavioural, cognitive, current, and future dimensions

There are four other dimensions which have not been paid much attention in comparison with previous four dimensions (case, effect, social, and intellectual dimensions). Tan (2001) distinguished alignment research into behavioural and cognitive dimensions. These two dimensions focus on how organisations "behave" (behavioural dimension) and how organisations "think" (cognitive dimension). In addition, Tan (2001) argued that these two dimensions are considered as inseparable because managers behave what they think. In comparison, the behavioural dimension has been adopted frequently in the alignment literature. He suggested that more focus should be added to cognitive dimension to enrich the assessment of alignment.

The other two dimensions are current and future dimensions. They are embodied in Itami and Numagami's (1992) and Nakayama's (2001) studies. They recommend that alignment researchers focus more on the "current" constructs and the "future" construct. For example, Nakayama (2001) suggested a consideration of the alignment between what businesses are currently doing and what they can be doing. Itami and Numagami studied current strategy and technology and future strategy and technology (Itami & Numagami, 1992). They identified three kinds of dynamic interaction that are conceivable between strategy and technology:

1. Between current strategy and current technology,
2. Between current strategy and future technology,
3. Between future strategy and current technology.

As organisations become more complex, alignment is more dynamic than static and incorporates more than just the readily available structures (Chan, 2002). Thus, businesses should consider more about aligning the present construct with the future construct. Bergeron, Raymond, and Rivard (2001) also called for adopting longitudinal perspective rather than cross-sectional operationalisations of alignment.

Alignment dimensions of this thesis

In total, eight dimensions of alignment have been discussed in previous sub-sections, cause, effect, social, intellectual, behavioural, cognitive, current, and future dimensions. In terms of the cause and effect dimensions, the construct of OCAs falls into the effect dimension. This is because the measure is of the OCAs themselves, not of the factors or processes which force organisations to conduct the OCAs. The construct of Web sites concerns the evaluation of what OCAs the Web sites are supporting. Again, it is about the "outcome", showing how the Web sites support the OCAs. Thus, the construct of the Web site also falls into the effect dimension.

In terms of the social and intellectual dimensions, the constructs of OCAs and Web sites fall into different dimensions. The construct of OCAs falls into the social dimension. This is because this research concerns the OCAs which are revealed by the management, rather than what OCAs have been documented in the organisation. The former (management belief) is a social aspect, whereas the latter (written document) is an intellectual aspect. Thus, the OCAs elicited from the management fall into the social dimension. In contrast, the construct of Web sites is in the intellectual dimension. This is because this research tends to evaluate the Web site and identify what OCAs the Web sites are supporting. The measurement construct now is the Web site. Web sites are one type of intellectual tool. Thus, the construct of Web sites falls into the intellectual dimension.

In regard to behavioural and cognitive, the two constructs are also in the different dimensions. The construct of OCAs is in the cognitive dimension. The reason is that this research concerns the understanding and cognition of the OCAs from the management. Thus, the construct of OCAs falls into the cognitive dimensions. In contrast, the construct of Web sites is in the behavioural dimension. Since the measurement construct is the physical Web site, not the cognition of the management on the Web site. Thus, the construct of Web sites falls into the behavioural dimension.

The last two dimensions which should be considered, are current and future dimensions. Both constructs of OCAs and Web sites fall into the current dimension. This is because the overall support discussed in this thesis concerns the OCAs currently conducted by the organisation and the Web site content currently presented to support the OCAs. Thus, the measurement of these two constructs falls into the

current dimension. The dimensions which the two constructs discussed in this thesis belong to are summarised in Table 2.5.

Table 2.5 *Dimensions of the constructs discussed in this thesis*

Constructs	Dimensions which the construct belongs to			
OCAs	Effect	Social	Cognitive	Current
Web sites	Effect	Intellectual	Behavioural	Current

In a summary of Section 2.4.1, the overall support discussed in this thesis is a one-way alignment between the two constructs – OCAs and Web sites. The OCA is the driver between the two constructs. The alignment perspectives adopted are the dimension of effect and social for eliciting OCAs, and the dimension of effect and intellectual for evaluating Web sites. In addition, the OCAs derived from management fall into the cognitive and current dimensions (what OCAs the management believes that they are doing currently). The measure of Web sites in supporting the OCAs falls into the behavioural and current dimensions (how the current content of the Web site supports the OCAs).

2.4.2 Learning from the IS alignment discussion

As discussed in the preceding section (Section 2.4.1), the overall supported discussed in this thesis can be considered as a specific type of IS alignment. This section will present how the overall support made to OCAs from Web sites can be discussed, and what framework and method can be used to translate the results into useful suggestions to improve the Web site based on the lessons learned from the IS alignment discussion. The discussion of overall support means how to compare, interpret, and calculate the results produced from the interviews and the manual Web site evaluations in order to reach the conclusion on how well the Web site supports the OCAs in overall.

2.4.2.1 Discussion: Perspectives of IS alignment

One crucial question should be posed when learning from the IS alignment discussion is: what perspective of IS alignment discussion is appropriate for the discussion on the overall support. There is some debates on how alignment can be discussed in the IS

alignment literature (Hussin, King, & Cragg, 2002). This thesis provides a classification model, which includes four perspectives, to classify the discussion of the alignment in the IS alignment literature. This framework is based on two issues – whether the discussion of alignment is based on qualitative or quantitative approach, and whether the discussion of alignment is at the dimension or overall level. Figure 2.9 shows this classification model.

Figure 2.9 *A classification model of the discussion of alignment*

	Dimension level	**Overall level**
Qualitative	Perspective **I**: e.g. Idea profile	Perspective **II**: e.g. Alignment model, and alignment levels
Quantitative	Perspective **III**: e.g. Degrees	Perspective **IV**: e.g. Degrees and levels

The first issue is whether the discussion of alignment is based on a qualitative or quantitative approach. In general, the discussion of alignment can be dichotomised into qualitative and quantitative approaches. The qualitative approach is based on a set of qualitative descriptions (Schneider et al., 2003), understanding the construct in qualitative terms (Macdonald, 1994), discussing the alignment in qualitative terms (Chan & Huff, 1992), or discussing the alignment perspectives (e.g. Baets, 1992; Henderson & Venkatraman, 1993; Henderson, Venkatraman, & Oldach, 1996; Luftman, Lewis, & Oldach, 1993; Venkatraman et al., 1993). In contrast, a quantitative way of measuring alignment refers to the "appropriateness" of the various elements to one another (Chorn, 1991). Most often, a quantitative approach uses the responses to a survey (Schneider et al., 2003). For example, Kathuria and Porth (2003) employed survey technique to test the alignment model. These two approaches use different ways to discuss the alignment.

The second issue is whether the discussion of alignment is on the dimension or overall level. This issue can be illustrated by the studies of Cragg et al. (2002) and Hussin et al. (2002). They proposed nine items which can be used to measure the

constructs of business and IT strategies. Then, they argued that the alignment is discussed by what the results in each end and how different the results of two ends are from an overall perspective rather than splitting alignment into various parts of the nine items. This argument shows that the discussion of alignment can be on the dimension (or item) level or an overall level.

When perspective I is adopted, the most common method to discuss the alignment of constructs is to create an "ideal profile". That is, to develop a profile to match the dimension of one construct with the dimension of the other (Sabherwal & Chan, 2001). For example, Miles and Snow (1994) the identified the ideal profile for matching the organisational characteristics with three typologies – Defenders, Prospectors, and Analysers. These characteristics are summarised in Table 2.6.

Table 2.6 *Ideal profile for matching organisational characteristics with business typologies*

Organisational Characteristic	Defenders	Prospectors	Analysers
Product-market strategy	Limited, stable product line, market presentation	Broad, changing product line, first in to new markets	Stable and changing product line, second in with an improved product
Research and development	Process skills, product improvement	Product design, market research	Process and product adaptation
Production	High-volume, low cost specialised processes	Flexible, adaptive equipment and processes	Project development shifting to low-cost production
Organisational structure	Functional	Divisional	Mixed project and functional matrix
Planning process	Plan, Act, Evaluate	Act, Evaluate, Plan	Evaluate, Act, Plan

As shown in Table 2.6, the typology and organisational characteristics are considered as two constructs. Those descriptions in the triangulated quadrants are the ideal profile which is used to match the specific organisational characteristics to each of the business typologies. A large number of IS alignment researchers have adopted this perspective to discuss the alignment between two constructs (e.g. Bauer, 2001; McFarlan, Mckenney, & Pyburn, 1983; Miles & Snow, 1994; Sabherwal & Chan, 2001; Sabherwal & Kirs, 1994).

When perspective II is adopted, the focus is on the qualitative discussion of alignment at the overall level. It is to generate the alignment discussion between the two constructs overall rather than on the dimensions of the two constructs. Two methods are utilised frequently in this perspective – the discussion on the alignment levels and alignment models.

In regard to the discussion on the alignment levels, alignment researchers developed levels for discussing the alignment between two constructs. For example, Woolfe (1993) proposed four stages of alignment to describe the alignment between IT plans and organisational plans: functional automation, cross-functional integration, process automation, and process transformation. Luftman (2000) developed five levels to discuss the alignment maturity: initial/ad-hoc process, committed process, established focused process, improved/managed process, and optimised process. Burn and Szeto (2000) also discussed the alignment between the organisation and IT strategies based on five levels: failure, few benefits, better than not doing it, successful but can improve, and highly successful.

In regard to the discussion on the alignment models, the qualitative discussion on the strategic alignment model is dominant in the IS alignment literature (Baets, 1992; Henderson & Venkatraman, 1993; Henderson et al., 1996; Luftman et al., 1993; Papp, 2001; Venkatraman et al., 1993). They discussed the implications of the alignment of any three of the four constructs in the model. Kerr and Jackofsky (1989) also developed a contingency model which can be used to discuss the alignment between managers and organisational strategy. This was based on the assumption that organisational effectiveness is enhanced by aligning managerial talent with strategic demand.

When perspective III is adopted, the focus is on measuring the alignment in the dimension level quantitatively. Discussion of the degree of the alignment on each dimension is adopted frequently in this perspective. For example, Pyburn (1983) argued that it was important to identify whether the IS plan addressed the critical needs of the organisation and in what degree. Ball et al. (2003) revealed that the degree of similarity of response on the dimensions determines the degree of alignment. The degree can be seen as a unique continuum from low to high, rather than as polarities on a single scale (Van de Ven, 1979).

When perspective IV is adopted, the focus is to discuss the alignment on the overall level on a quantitative basis. The researchers from this perspective quantitatively analysed the alignment of the dimensions in the construct(s) first, and then discussed what level or type of overall alignment the results should be fit into. For example, Miles and Snow (1994) first defined the degree of alignment as depending on how the alignment creates success to organisations. Then, they categorised the overall alignment into four levels:

1. Misfit: failure
2. Minimal fit: survival
3. Tight fit: excellence
4. Early, tight fit: hall of fame

Tan (1994) also analysed the degree to which IT was explicitly considered in organisations' strategy formulation first. Then, he categorised the overall alignment of IT and organisational strategy into three types: independent, supportive, and integrated. The results derived from the degree to which IT was explicitly considered in organisations' strategy formulation as being used to justify what type of IT-strategy alignment the case is.

The overall support discussed in this thesis is based on the perspective I which involves the qualitative discussion of the alignment in the dimension levels. This means that the overall support given to OCAs from Web sites should discuss how well the Web site supports every OCA elicited from the management. Then, the discussion on the overall support made to each of the OCAs becomes a qualitative format.

There are two reasons for choosing the perspective I. Firstly, as Schneider et al. (2003) contended, the richness and detail of information necessary to fully understand and apply the concept of alignment is missing in the statistical test of synergies existing among the practices. Thus, a qualitative discussion of alignment is advantageous because it can provide an intimate assessment of the extent to which the construct is enacted in ways that the management actually experience it. In other words, it not only discusses what practices the informants "say", but also how they "experience" them. Secondly, discussing the alignment on the dimensions gives more implications for monitoring the IS. This is because each dimension can be discussed

on its practices of alignment and misalignment. Thus, the management can diagnose what areas they can improve in order to achieve or enhance the alignment practices.

However, the discussion on how well the Web site supports each OCA during the overall support discussion should be differentiated from that during the manual Web site evaluation. The discussion during the manual Web site evaluation, as discussed in Section 2.3, should be in a quantitative format. For example, the support made to advertising activity includes three Web pages containing 1000 words in total to describe a product of the organisation. In contrast, the discussion during the overall support discussion should be in a qualitative format. For example, should the organisation provide more information when describing the product or is the 1000-word description on the three Web pages enough to support the advertising activity?

These two examples show that the discussion on the support during the Web site evaluation focuses on "presenting the facts" whereas the discussion during the overall support discussion focuses on "making sense of the facts".

2.4.2.2 Framework and method of making suggestions

As discussed in the preceding sub-section (Section 2.4.2.2), the perspective of overall support discussion adopted by this research is the qualitative discussion on the dimension level. The next question is: What framework and method can be used to translate the interview and Web site evaluation results into useful suggestions to improve the Web site based on the qualitative discussion on the dimension level?

A review of the IS alignment literature has found that this area has not been paid much attention, in comparison to the quantitative research into IS alignment. Among those based on qualitative discussion, only a small number of studies provide the framework and method to improve the alignment practice.

However, a tendency has been found among those studies based on the qualitative discussion. Those researchers tend to use diagrams to display the current alignment and misalignment practices, and then to discuss how the realignment can be possibly made. For example, Cobb, Samuels, and Sexton (1998) developed a diagram, which was called "market alignment profiles", to display and discuss the support given between marketing and human resource practices in a company. Hirschheim and Sabherwal (2001) also utilised a diagram to illustrate where the current business and IS strategies of the firm are, how they support to each other, and how to link them

in the profiles. They argued that a diagram can help organisations in pursuing the efforts which create the support between business strategies and IS strategies. Thus, this research will utilise a diagram to display the overall support, and then make useful suggestions to improve the Web site based on the display on the diagram.

2.5 How Are the Research Questions Answered?

The previous four main sections (Section 2.1. to 2.4) sought the answers for the four research questions proposed in Chapter 1 by reviewing the relevant literature. Section 2.1 was organised to provide answers to the first research question: What kinds of activities are OCAs in organisations and what is a proper description to define these kinds of activities? Because the notion of OCA is new, this question helps understand the nature of OCAs.

The review showed that there is no such meaning which is found to match with the OCA discussed in this thesis, although the term critical activity is being employed in some management areas. It also shows that organisational strategies and the environment have strong interrelationships with the OCAs in organisations. Organisations tend to conduct a list of OCAs to overcome the problems they have faced when adopting certain type of typology. Moreover, there should be priorities on this list of OCAs. This thesis argued that OCAs should be differentiated from several confusing terms which include critical success factors, value-added activities, critical business activities, and strategic activities. The differentiations have been summarised in Section 2.1.3.5. According to these differentiations, OCAs are the activities which particularly enable organisations to achieve their predefined success. However, the OCAs identified from organisations are not new activities, but existing ones. They are simply identified by the specific methodology.

Section 2.2 was organised to provide answers to the second research question: How can OCAs be identified and what methodology and sources can be used? The review showed that three approaches can be possibly adopted to elicit OCAs: narrative, classificatory, and comparative. However, the comparative approach is more appropriate for eliciting OCAs because OCAs are already a list of activities.

Furthermore, the dimensions of OCAs also should be developed before the eliciting process is conducted. This section has provided a list of dimensions of OCAs

which is termed "generic OCAs". Thus, the proper approach for eliciting OCAs can be termed "a priori comparative approach".

Concerning the method of eliciting OCAs, the interview method without supplying generic OCAs is appropriate which means the interviewee is asked to nominate a list of OCAs without being supplied with a list of generic OCAs. This method can elicit OCAs and explore the notion of OCAs at the same time. Although the generic OCAs will not be utilised in the interviews, they will be used in the data analysis stage.

Section 2.3 was organised to provide answers to the third research question: How can the organisation's Web site be evaluated in terms of how well the Web site supports the OCA supposing an OCA in an organisation is identified; and what methodology and tools can be used? The review showed that "how well" means "how effectively" and "how efficiently" in terms of measuring the support made to OCAs from Web sites. This is because the Web site evaluation perspective discussed in this research is the Organisation Provider perspective. The evaluation of Web sites is conducted by the provider and seeks to discover how the Web site can add value to the organisation. Thus, "how effectively" and "how efficiently" should be considered when measuring the support made to OCAs from Web sites.

The criterion used to measure how effectively the Web site supports the OCA should be informativeness. This criterion focuses on how informatively the Web site supports OCAs. Two aspects should be considered when evaluating this: the amount of the information supporting an OCA and the relevance of the information. The criterion used to measure how efficiently this is done should be interactivity. This criterion focuses on how interactively the Web site supports OCAs. The interaction level approach, which identifies the level of interactivity from an overall perspective, is appropriate to evaluate the interactivity of Web sites in supporting OCAs. This is because this is a more flexible approach, and leaves room for adding new features which belong to the levels.

The proper evaluation methodology used to measure how effectively and efficiently the Web site supports the OCA should be manual Web site evaluation which typifies a quantitative analysis on the Web site manually. The reason for adopting the quantitative analysis is that both the processed data of the measures of informativeness and interactivity are numeric (amount of relevant information and the

level of interactivity), that is, quantitative. And the reason for adopting the manual approach is that this approach, a human based analysis, is a better way to judge the relevancy of the information and diagnose the latest and interactive features in the Web sites in the evaluation process. However, a major difficulty with adopting a manual approach is the inefficiency of evaluating the enormous amount of Web pages in an acceptable time frame. To deal with this difficulty, it is important to focus on the topic in the aggregated Web pages in the Web site evaluation and also to employ evaluation guidelines and forms to help the evaluator assess the Web site.

Section 2.4 was organised to provide answers to the fourth research question: How can the overall support made to an organisation's OCAs from their Web site be discussed? How can the results be translated into useful suggestions to improve the Web site and what framework and method can be used? The review showed that the overall support discussed in this thesis is a specific type of IS alignment, that is, the one-way alignment between two constructs – OCAs and Web sites. The OCA is the driver. The alignment perspectives adopted are the dimension of effect and social for eliciting OCAs, and the dimension of effect and intellectual for evaluating Web sites. In addition, the OCAs derived from management are what management believes that they are currently conducting. The measure of Web sites is about evaluating what the Web site currently presents to support the OCAs.

Because the overall support discussed in this thesis is a specific type of IS alignment, various perspectives, which can be used to discuss the IS alignment, have been reviewed. The overall support discussed in this thesis is the qualitative discussion of the alignment in the dimension levels. Thus, when discussing the overall support made to OCAs from Web sites, it is crucial to discuss how effectively and efficiently the Web site supports each of the OCAs in a qualitative format. Moreover, this thesis also found that utilising diagrams helped display how effectively and efficiently the OCAs were supported by the Web site, and to help the discussion of how the Web site could be improved to create superior support. Therefore, this research should adopt a diagram to help discuss the overall support and to help make suggestions for the improvement of the Web site.

Overall, there are three findings made from reviewing the relevant literature. Firstly, the literature shows a limited understanding on the nature of OCAs and how OCAs can be identified technically. Secondly, an evaluation framework which can be

utilised to discuss the support made to OCAs from Web sites is lacking. Thirdly, a comprehensive evaluation methodology is still missing. This comprehensive evaluation methodology should be able to integrate all proper methods and approaches suggested by this chapter in order to evaluate the support made to each OCA and the overall support to OCAs from Web sites. In conclusion, the four research questions are not fully answered by the literature. However, these sections show that the literature does answer the questions partly by providing some theoretical support.

2.6 Chapter Summary

This chapter has reviewed the relevant literature in order to find the answers for the four research questions proposed in Chapter 1. Five major sections were presented. Section 2.1 discussed the meaning of an activity and the implications shown from the literature which helps us understand the notion of OCAs. OCAs were also differentiated from other confusing terms and concepts. Section 2.2 identified the proper approach and method which can be used to elicit OCAs from management. Section 2.3 discussed the perspectives, criteria, and methodologies which should be adopted for evaluating how well Web sites support OCAs. Section 2.4 justified the proper perspective for discussing the overall support made to OCAs from Web sites and how suggestions can be made to improve the Web designs. This section particularly borrowed the theories from the IS alignment literature. Section 2.5 discussed how the four research questions are answered by the literature. This chapter concluded that the four research questions are not fully answered by the literature.

CHAPTER 3

RESEARCH DESIGN

This chapter will present the research design which has been developed and carried out specifically to answer the four research questions stated in Chapter 1 in a more detailed manner. This chapter begins with Section 3.1 which will present a grand plan which has been proposed to answer the four research questions. Section 3.2 will discuss the research paradigms this research is grounded in. Section 3.3 will discuss the research methodology this research has adopted. Section 3.4 will show the research framework which has been used. Section 3.5 will explain how the results will be presented in the chapters following Chapter 3. Section 3.6 will provide an assessment on the quality of the research design discussed in this chapter. The last section, Section 3.7, will provide a summary of this chapter.

3.1 A Grand Plan to Answer the Research Questions

As shown in the Chapter 2, the literature only partly answered the four research questions. There is a need to conduct an empirical research to answer them in full. This research has developed a grand plan to conduct the empirical research to achieve this.

Firstly, a prototype evaluation methodology has been developed. This evaluation methodology can be used to evaluate the support made to OCAs from Web sites. It includes several components which are grounded in the key theoretical foundations discussed in Chapter 2. These components are also crucial to answering the four research questions. Secondly, a development process will be conducted to develop a valid and reliable evaluation methodology based on the prototype evaluation methodology. The details of this plan will be explained in the following sub-sections.

3.1.1 Prototype OCAWSEM

A prototype evaluation methodology is proposed based on the theoretical foundations discussed in Chapter 2. This prototype can be used to evaluate the support given to OCAs from Web sites. It is termed "Prototype OCA Web Support Evaluation Methodology" (Prototype OCAWSEM) in the following context. The components of the Prototype OCAWSEM are an interview guide, a Web site evaluation framework, tools of overall support discussion, and evaluation process descriptions. Each of these components is discussed in the following sub-sections.

3.1.1.1 Component 1 – the Interview Guide

The Prototype OCAWSEM includes an interview guide which is termed the Interview Guide in this thesis. It provides a definition of OCAs and a set of interview questions that can be used to elicit OCAs from management during the interviews. The order of posing these questions and the definition of OCAs are shown in Table 3.1 (see next page).

Table 3.1 *The questions, sequence posed, and the definition*

Order	Questions and Definition Posed
1	Please describe your role, your job, and how long you have been in this job.
2	Definition of OCAs: An activity which must be conducted by the organisation constantly in order to be successful in the industry.
3	Please describe what this organisation's OCAs are.
4	What is their priority?
5	How do you support and enable these OCAs?
6	Would you suggest other people who know about the OCAs in this organisation and I can have interviews with them?

The set of interview questions included in the Prototype OCAWSEM has two groups. The first group is the main questions. As discussed in Section 2.2, the self-typing approach and the interview method without supplying generic OCAs during the interview are appropriate to elicit OCAs from management for the purpose of this thesis. Thus, it is proper to pose questions which encourage interviewees to reveal the OCAs in the organisation. To achieve this end, one question is added in the Interview Guide, which is: Please describe what this organisation's OCAs are.

The question asking the interviewee to describe a list of OCAs is followed by two other questions: What is their priority? and How do you support and enable these OCAs? In terms of the first question, as discussed previously in Section 2.1.2.3, there is a priority on OCAs in organisations to suit their strategy and to deal with the external environment if they desire to be successful. Thus, it is crucial to ask the interviewee to give a priority for the OCAs that they identified. In terms of the second question, defining and understanding the OCA is not an easy task. Interviewees may use various terms to describe the same OCA or use the same term to describe different OCAs. Thus, asking the interviewee to describe how to support and enable the OCAs is necessary to ensure an accurate interpretation and understanding of their answers.

The second group is the background questions. The first background question is: Please describe your role, your job, and how long you have been in this job. The second background question is: Would you suggest other people who know about the OCAs in this organisation and I can have interviews with them? This can be utilised to generate future interviewees from the current one. Since the notion of OCAs is new, a list of well written OCAs is not available to the management in organisations. Thus,

it is less likely that interviewees will reveal same OCAs. Interviewing more management staff members is more appropriate than just interviewing one. Because the interviewee has a better understanding than the interviewer of who knows the OCAs in the organisation, asking current interviewee to nominate future interviewees is helpful in finding interviewees.

3.1.1.2 Component 2 – the Web Site Evaluation Framework

The Prototype OCAWSEM includes a Web site evaluation framework which is termed "Web Site Evaluation Framework" in this thesis. It can be used to identify a list of OCAs, and shows which OCAs the Web site supports well and which it does not. This framework comprises four Web site evaluation forms: Web Site Evaluation Forms 1, 2, 3, and 4. The literature review has argued that the manual approach is more appropriate than automated approach, and utilising the Web Site Evaluation Forms can overcome the difficulties faced by evaluators, such as not being familiar with the evaluation tools or being unable to cope with the complexity of an enormous Web site, by providing instructions and descriptions to assist in evaluation of Web site systematically and manually. In addition, the Web Site Evaluation Forms are convenient for recording, retrieving and comparing results.

The four Web Site Evaluation Forms are based on various key theoretical issues discussed in Chapter 2. In overall, these forms are utilised to evaluate how well the Web site is supporting OCAs from the provider's view point in order to add value to the business that provides the Web site. These forms should be different from those common evaluation instruments which are provided for the evaluation from the user's view, such as the instruments which can be used to evaluate the quality of the Web site or user's satisfaction. For example, specific evaluation criteria for these forms are required. As discussed in Chapter 2, they are informativeness and interactivity. Moreover, the Web Site Evaluation Forms are utilised to evaluate the content of the Web site only, rather than the systems or social aspects.

Concerning these forms individually, Web Site Evaluation Forms 2, 3, and 4 have been developed based on the two Web site evaluation criteria discussed in Chapter 2: informativeness and interactivity. The informativeness is used to evaluate how effectively the Web site supports OCAs, while the interactivity is utilised to evaluate how efficiently. Evaluating how informatively the Web site supports OCAs

has to be concerned with both the amount and the relevance of the information which is supporting the OCA. Judging interactivity of the Web site in supporting OCAs is based on the interaction level approach. The Web Site Evaluation Forms provide descriptions of various levels of interactivity. The evaluator utilises the descriptions to analyse the Web site, and select a level which is best to describe the interactivity of the Web site in supporting a particular OCA.

Web Site Evaluation Form 2 can be employed to record the sub-sites which are supporting OCAs. Web Site Evaluation Form 3 is used to transform the results recorded in the Web Site Evaluation Form 2 into how effectively and efficiently the Web site supports OCAs. Web Site Evaluation Form 3 contains clear descriptions of the three levels of informativeness in order to assist in evaluating how effectively the Web site supports OCAs. Web Site Evaluation Form 3 also contains descriptions of three levels of interactivity to assist in evaluating how efficiently the Web sites support OCAs. Web Site Evaluation Form 3 records the results of evaluation on Web sites based on effectiveness and efficiency. Then, Web Site Evaluation Form 4 is utilised for grouping the OCAs which are being supported by a Web site based on the results recorded in the Web Site Evaluation Form 3. Grouping the OCAs is also based on the effectiveness and efficiency of the support, which can save the time in prioritising the OCAs.

Different from these forms, Web Site Evaluation Form 1 is used to overcome a common difficulty faced by evaluators when they conduct a manual approach to Web site evaluation, that is, being unable to evaluate an enormous Web site efficiently if the evaluators are new to the use of the Web site. This form deals with this problem by asking the evaluator to browse the whole Web site and record useful information for understanding the Web site, for example, the types of the users of the Web site, and the Homepages of various net domains. Once the evaluator becomes more familiar with the Web site, the time for searching information can be reduced. The results recorded in the Web Site Evaluation Form 1 can be also retrieved in the later parts of the evaluation process for understanding the structure of the Web site.

3.1.1.3 Component 3 – tools of overall support discussion

The Prototype OCAWSEM includes a set of tools which can be used to determine the overall support given to OCAs from Web sites based on the results produced from

interviews and Web site evaluations. These tools are: the Organisational Critical Activity Repository (OCA Repository), a prioritising principle of interview results, two prioritising principles of Web site evaluation results and a diagram used to display the overall support given to OCAs from Web sites.

The reason for developing the OCA Repository and utilising it in the overall support discussion comes from the choice of the particular alignment perspective – qualitative and dimension level, discussed in Section 2.4. Because the overall support discussed here is a dimension level, there is a need to develop dimensions which can be utilised to evaluate the overall support given to OCAs from Web sites. The OCA Repository serves as these dimensions by providing a list of generic OCAs. These generic OCAs were presented in Section 2.2. These dimensions are utilised both to elicit OCAs from management and to extract OCAs from Web sites. However, these dimensions need a slightly adaptation to be utilised in any specific industry. Section 3.4.2.2 will discuss how these dimensions have been adapted in this research.

In addition, as discussed in Section 2.2, these generic dimensions will not be supplied to interviewees during the interview. They will only be utilised for collecting and analysing the interview results. As a complicated Web site may contain more than one thousand sub-sites and support hundreds of activities, it is insufficient to examine whether each one of these supported activities is an OCA. By referring the OCA Repository, evaluators can evaluate the Web site efficiently. Thus, these dimensions are incorporated into Web Site Evaluation Forms 2 and 3, and are recorded in the Web Site Evaluation Form 4.

Developing the principles of prioritising both interview and Web site evaluation results is to prioritise the two lists of OCAs generated from interview and Web site evaluations. The prioritising principle for interview results is termed "Interview Prioritising Principle" in this thesis. The one Interview Prioritising Principle is "the activity as nominated by more interviewees is more critical". The prioritising principle for Web site evaluation results is termed "Web Prioritising Principle" in this thesis. The two Web Prioritising Principles are "the OCA in higher level has higher priority than the one in the lower level" and "the activity which is supported by more sub-sites has higher priority". These two principles are also based on the discussion of the levels of informativeness and interactivity in Section 2.3.4.

When the two lists of OCAs are identified, the next task is to discuss the overall support given to OCAs from Web sites. The discussion of overall support is based on the discussions in Section 2.4. If the Web site supports OCAs effectively and efficiently overall, the two lists of OCAs generated from the interviews and the Web site evaluation are matched well. The OCAs contained in the list given by the management should be found in the list extracted from the Web site. In addition, the OCAs contained in these two lists should be in the same order if the Web site fully supports management's view point on the OCAs.

Finally, a diagram, which can be used to display the overall support made to OCAs from Web sites, has been developed. It is termed "Overall Support Display Diagram" in this thesis. The Overall Support Display Diagram is utilised to demonstrate visually the current support made from the Web site and how the Web site can be improved in the future. As discussed in Section 2.4.2.2, adopting diagrams is helpful to discuss the overall support made between constructs. This diagram includes two dimensions – effectiveness and efficiency. Each dimension has three levels which are the levels of informativeness and interactivity. A combination of these two dimensions results in nine quadrants. All OCAs supported by the Web site are assigned into each quadrant in the Overall Support Display Diagram according to the levels of effectiveness and efficiency of the support received. Because the OCAs nominated by the management are critical to the organisation's success, these OCAs both nominated from the management and supported by the Web site should fall into the top right quadrant where means that the OCAs are with the highest levels of effectiveness and efficiency. If they are not, the user of this diagram should consider how to move the supported OCA from the current quadrant to the desired quadrant.

For example, the Organisational Critical Activity A is already located in the quadrant which is the highest level of effectiveness and the lowest level of efficiency. Thus, the suggestion made to the Web site design is providing those interactive features, which are ranked as level 3 of efficiency in the Web Site Evaluation Form 3 in order to shift the location of the Organisational Critical Activity from the current quadrant to the top right quadrant.

3.1.1.4 Component 4 – the Evaluation Process Instructions

The Prototype OCAWSEM includes a list of evaluation process instructions which can be used to guide the use of the components included in the Prototype OCAWSEM including the definition of OCAs, interview questions, the Web Site Evaluation Framework, and the tools of overall support discussion when collecting data from management and Web sites and analysing these data. These evaluation process instructions are termed "Evaluation Process Instructions" in this thesis. It has nine stages which can be categorised into three parts. They are described below.

The first part includes three stages: Identify Management Views, Analyse Interview Data, and Prioritise Organisational Critical Activities, and are respectively Stages 1, 2, and 3 in the Evaluation Process Instructions. The purpose of this part is to elicit a list of prioritised OCAs from management. Stage 1 requires a number of interviews to be conducted with senior management teams, Web teams and other members referred by interviewees. The interviews are recorded. Stage 2 requires the interviews to be transcribed and analysed. Lists of OCAs are generated after this stage. Stage 3 utilises the Interview Prioritising Principle to prioritise the lists of OCAs derived from interview results.

There are five stages in the second part: Investigate Web Background, Confirm and Generate Organisational Critical Activities, Analyse Effectiveness and Efficiency, Grouping, and Prioritising. They are Stages 4, 5, 6, 7, and 8 in the Evaluation Process Instructions respectively. The purpose of this part is to generate a list of prioritised OCAs from the Web site evaluation according to how efficiently and effectively these activities are being supported by the Web site. Stage 4 asks evaluators to browse through the Web site and to fill out the Web Site Evaluation Form 1. This helps the evaluator to become familiar with the Web site structure. Stage 5 requires the evaluator to identify and record the sub-sites which are supporting the OCAs listed in the OCA Repository into Web Site Evaluation Form 2. To identify the sub-sites, the process starts from reviewing the information and links on the Homepage, to the first level and to the second level of the sub-sites. Then, to apply this process to evaluate the Homepage and sub-sites linked by Internet, intranet, and extranet.

Stages 6, 7, and 8 provide instruction to analyse and interpret the results which are recorded in the Web Site Evaluation Form 2 into a list of prioritised OCAs. Stage

6 asks the evaluator to examine how effectively and efficiently the Web site is supporting each of the OCAs in OCA Repository, based on the criteria provided by Web Site Evaluation Form 3. The results are recorded into Web Site Evaluation Form 4. Stage 7 requires the evaluator to group the OCAs based on the results recorded in the Web Site Evaluation Form 3 into five groups as shown in the Web Site Evaluation Form 4. Then, Stage 8 provides the Web Prioritising Principles for the evaluator to prioritise those OCAs which were both nominated by the interviewees and listed in the Web Site Evaluation Form 4.

The third part includes only Stage 9 which is the Overall Support Discussion. This stage discusses not only the overall support made to OCAs from Web sites, but also how to improve the Web designs if any poor support does exist. It asks the evaluator to compare the two lists of OCAs generated from interviews and the Web site evaluation, and then discuss how well these two lists are matched. The discussion is based on both the content and priority matched between the two lists of OCAs. In other words, if the Web site is fully supportive of OCAs, the OCA nominated by the management as top priority should be supported by the Web site and be at the top of the supporting list.

Stage 9 also requires the evaluator to assign those OCAs, which were both nominated by the interviewees and listed in the Web Site Evaluation Form 4, into the Overall Support Display Diagram. Since OCAs are those activities dramatically important to an organisation's success, those activities nominated by management as OCAs should be supported by Web sites as efficiently and effectively as possible. When utilising the diagram, suggestions for the organisation to improve its Web site can be made easily and visually. How the suggestions can be made will be demonstrated in Chapter 5.

3.1.2 The OCAWSEM Development Process

A development process is conducted to further improve the Prototype OCAWSEM into a valid and reliable OCAWSEM. This development process is termed "OCAWSEM Development Process". The OCAWSEM Development Process includes two types of process – the OCAWSEM Developing Process and OCAWSEM Testing Process. The OCAWSEM Developing Process is conducted to develop and improve the Prototype OCAWSEM. The outcome of the OCAWSEM

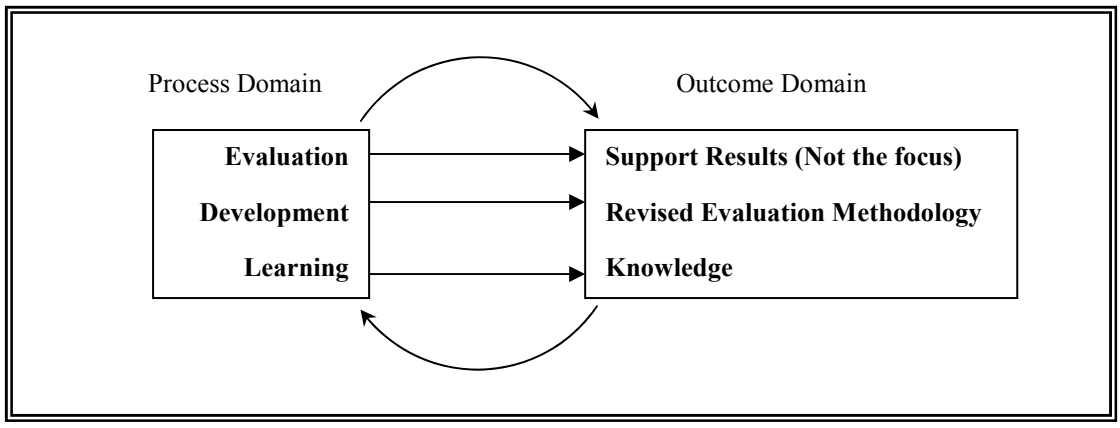
Developing Process is a final developed OCAWSEM which is termed "Developed OCAWSEM". Then, the OCAWSEM Testing Process is conducted to test the Developed OCAWSEM.

The OCAWSEM Development Process comprises three research tasks; evaluation, development, and learning. The evaluation task concerns on how to evaluate the support made to OCAs from Web sites by utilising the use of the Prototype OCAWSEM. The development task focuses on the improvement of the evaluation methodology. The learning task deals with what can be learned from conducting the evaluation and development tasks.

Three research outcomes are produced from the three tasks; support results, revised evaluation methodology, and knowledge. The support results produced from the evaluation task show how effectively the OCAs are being supported by Web sites. The revised evaluation methodology is the outcome derived from the development task. The knowledge is produced from the learning task, which denotes the knowledge of evaluating the support given to OCAs from Web sites as well as developing the OCAWSEM.

However, the interrelationships between the research tasks and outcomes are more complicated than just "means-and-outcome" relationships. In fact, there is an iterative relationship between these research tasks and outcomes. For a better clarification of these interrelationships, these three tasks are categorised into process domain while the three outcomes are categorised into outcome domain. These interrelationships can be demonstrated by Figure 3.1.

Figure 3.1 *The interrelationships between the research tasks and outcomes*



Previous discussions have shown that the tasks conducted in the process domain generate the outcomes in the outcome domain, that is, the process domain informs outcome domain. However, the outcome domain also informs the tasks in the process domain. For example, the knowledge in the outcome domain can be used for the development task (developing the evaluation methodology) in the process domain; the revised evaluation methodology can be utilised by the learning task in the process domain. On one hand, the interrelationship between process and outcome domains is an iterative developing process, which means it is not a one-off process. It includes continuous improvement for developing the Prototype OCAWSEM. As Sethi and King (1991) explained, an iterative approach is required for the development of the evaluation methodology because construct measurement is usually difficult to achieve in the social science. On the other hand, the interrelationship is an iterative learning process, which includes generating knowledge from learning and informing further learning from the generated knowledge continuously. Walsham (1993) and Serafeimidis and Smithson (1999) also describe the IS evaluation involving this interrelationship as a learning and understanding process.

However, a critical point should be stated here. The support results are not the focus of this research. The focus of this research is to develop an OCAWSEM. In addition, they can be unreliable. As the notion of OCAs is new, there are limited literature and theoretical foundations to elicit OCAs and to evaluate the support given to the identified OCAs from Web sites. Thus, it is not surprising that these support results are fallible.

3.2 The Research Paradigms

This research is based on three research paradigms: interpretive, hermeneutic phenomenology, and action learning. The meanings of these paradigms and how they have influenced this research are discussed in the following sub-sections.

3.2.1 Interpretive paradigm

The design of the whole research in this thesis is based on the interpretive paradigm. Researchers in this paradigm treat human organisations as based on subjective

meaning and interpretation (Mingers, 1997). People create and associate their own subjective and inter-subjective meanings as they interact with the world around them. Thus, the interpretive researcher attempts to understand phenomena through accessing the meanings that participants assign to them (Orlikowski & Baroudi, 1991). Klein and Myers (1999) state that:

> *IS research can be classified as interpretive if it is assumed that our knowledge of reality is gained only through social constructions such a language, consciousness, shared meanings, documents, tools, and other artefact (Klein & Myers, 1999, p. 69).*

There are three major reasons to justify why this research is based on the interpretive paradigm. Firstly, the interpretive paradigm is proper for this thesis to generate the knowledge to explain how and why the research tasks produce the research outcomes. As discussed previously, generating the knowledge during the OCAWSEM Development Process is the research task in this thesis. The interpretive research can yield richer knowledge through the explanations on how and why processes and outcomes occur (Kaplan & Duchon, 1988). Moreover, interpretive research also provides valuable opportunities for the researcher to learn, reconstruct experience and generate profound knowledge on the phenomena (Laverty, 2003; Orlikowski & Baroudi, 1991). Thus, this research should be based on the interpretive paradigm.

Secondly, the interpretive paradigm is proper for this thesis to both evaluate and understand the IS system at the same time. Interpretive research can enrich the researcher's understanding of the information system during the evaluation. Introna and Whittaker (2003) called the unknown area that researchers want to understand during the evaluation as the "understanding zone". Positive research is not appropriate to explore this area because it has been addressing the issues of efficiency and effectiveness extensively and thus hard to understand the deeper meaning (Orlikowski & Baroudi, 1991). In contrast, interpretive research can enrich this understanding zone by allowing the research to have more opportunities to describe, interpret, analyse, and understand the social world from the participants' perspective during the evaluation process (Orlikowski & Baroudi, 1991). Thus, this research should be based on the interpretive paradigm.

Thirdly, interpretive research can provide many more insights into the benefits of IS to the organisation rather than to the users. Very often, interpretive IS evaluation provides fruitful insights as to the benefits to an organisation of a wide range of IS (McBride & Fidler, 2003). The user opinion is largely ignored and the grounded concerns with regard to IS evaluation are not exposed in the interpretive IS evaluation (Jones & Hughes, 2001). Since this research evaluates Web sites from the Organisation Provider perspective, the interpretive research is suitable to help businesses monitor their benefits to themselves during the evaluation process. Thus, this research should be based on the interpretive paradigm.

However, the research within interpretive paradigm does not share the same perspectives on the ontological (the way to see the physical and social reality), epistemological (the beliefs of the most appropriate ways of knowing) or methodological aspects (the methods and tools to uncover what is believed can be known). This shows that more paradigms within the interpretive paradigm are available. For example, Walsham (1993) broadly categorised the interpretive research on the IS research in organisations into five paradigms: computers and cognition, phenomenology and hermeneutics, soft systems methodology, critical theory, and post-modernism. Orlikowski and Baroudi (1991) identified two types of interpretive research: weak constructionist (the interpretive research is understood to complement the positive research) and strong constructionist paradigms (the interpretive research is not to complement the positivist's investigations, but to replace them). The classifications on the paradigms within interpretive paradigm are diversified.

Butler (1998) suggested that a question mark should be placed over the studies that identify themselves as interpretivist and who fail to provide clear indication of the philosophical foundations on which their interpretive perspectives are based. Thus, it is necessary to identify in detail which paradigm(s) this thesis is based on. Yet, it is important to note that the paradigms within the interpretive paradigm do share the same epistemological assumptions since they are all interpretive research. Thus, choosing the paradigm among them is based on their differences rather than similarities.

3.2.2 Hermeneutic phenomenology paradigm

The evaluation task conducted in the OCAWSEM Development Process in this research is grounded on the hermeneutic phenomenology paradigm. This is one of paradigms in the interpretive approach used while studying information systems (Walsham, 1993). Since the evaluation task is to evaluate the support given to OCAs from Web sites, the assumptions underlying the hermeneutic phenomenology paradigm have influenced evaluating the interview data and the data on the Web site.

What is hermeneutic phenomenology paradigm? Butler (1998) believed that hermeneutic phenomenology is married from the philosophies of hermeneutics and phenomenology. It is both hermeneutic and phenomenological in terms of understanding the meaning of the phenomena and interpreting the text through a hermeneutics circle. Hermeneutics can be also thought of as a key strand of phenomenology because the interpretation of texts is an important part of phenomenology (Walsham, 1993). Thus, the hermeneutic phenomenology paradigm is a type of phenomenology.

Because hermeneutic phenomenology is a type of phenomenology, it inherits the characteristics of phenomenology which is concerned to understand the phenomena (the essence of our experience) that the researcher believes to be the totality of what we can know (Walsham, 1993). The key issue in this description is the word “understanding”. According to Boland’s (1985) clarification, an IS to the positivist is a camera that merely takes pictures of what is simply existing in the organisation. In contrast, the phenomenologist treats the information system as a formal and technological communicative act that constitutes, rather than reflects, organisational reality. Thus, the phenomenology of IS evaluation has a better understanding than the positive approach. Boland (1985) also clarified that positive science believes that meanings are not problematic, whereas phenomenology accepts that meaning is the central problem for all knowledge in this social world.

Because hermeneutic phenomenology is a type of hermeneutics, it also inherits the characteristics of hermeneutics which is concerned with the translating and interpretation of any textual material (Walsham, 1993). Understanding the text requires a structural approach and a circular process (Butler, 1998). The most fundamental principle of hermeneutics is the hermeneutic circle (Jones & Hughes, 2001). The hermeneutic circle is through the understanding of parts and

interrelationship between parts in order to understand the whole life-world (Jones & Hughes, 2001). It is the interpretation progresses through time and improves as we become aware of the various presuppositions and assumptions we use in interpreting our experience of the world as text (Rathswohl, 1991). Myers (1994) also argued that the hermeneutic circle is particularly useful to answer the basic question in hermeneutics: What is the meaning of this text? This is because a hermeneutic circle provides the dialectic between the understanding of the text as a whole and the interpretation of its parts.

However, hermeneutic phenomenology and phenomenology are different. Laverty (2003) found two differences. Firstly, phenomenology is foundationalist (it seeks a correct answer or valid interpretation of texts) whereas hermeneutic phenomenology is described as non-foundationalist (it focuses on meaning that arises from the interpretive interaction between the text and the reader). Secondly, they employ different processes of self-reflection. The phenomenology approach asks the researcher to bracket the biases and assumptions in the process of self-reflection whereas the hermeneutic phenomenology approach does not, but rather is embedded and essential to interpretive process. Therefore, it is allowed that the final document derived from a hermeneutics phenomenological study includes personal assumptions of the researcher and philosophical bases from the interpretations. Laverty (2003) believed that the overt naming of assumptions and influences is a key contributor to the research process in hermeneutic phenomenology.

3.2.3 Action learning

Action learning is chosen as the approach for conducting the learning task in the process domain in this thesis. McGill and Beaty (1995) described action learning as an intentional and conscious process, a process integrating the cognitive and affective aspects of ourselves, and a learning process. The key idea underlying this paradigm is to integrate cognitive reflection into the learning process.

McGill and Beaty (1995) defined action learning as comprising four phases; experience, reflection, generalisation, and testing. These four phases are conducted sequentially, and become an iterative cycle. The reason for choosing this approach is that these four phases can be used not only for the learning task, but also incorporating two other research tasks (the evaluation and development tasks) in the

process domain into a whole learning process. In other words, these four phases are the actual context when conducting the learning, evaluation, and development tasks. For example, the evaluator utilises the evaluation methodology to evaluate the support made to OCAs from the Web site in a field case. This can be considered as a test phase in the action learning. Then, the evaluator reflects on what he or she has been experiencing in the evaluation process, which can be treated as the experience and reflection phases. Thus, these four phases are incorporated into the research framework in this thesis.

There are two aspects in the action learning model which are the group and the individual aspects. As McGill and Beaty (1995) described, the essence of an action learning group is its focus on the individual. Thus, this research focuses on the individual aspect of action learning. From this perspective, action learning is a process which aids the individual to use both action and reflection in order to learn from the iteration between the four phases (the experience, reflection, generalisation, and testing phases). In other words, this thesis views the learning task as the single researcher's task rather than a group of researchers learning through the four phases.

Action learning should be differentiated from action research. McGill and Beaty (1995) pointed out four differentiations. Firstly, the researcher of action research is usually an active participant within the case being studied, while committing to learning from the research. Thus, the learning set includes the study object. In contrast, in action learning, those involved in the research project will tend not to be part of the learning set. Secondly, action learning may involve some research in the action phase, yet, it is not essentially a research-oriented venture. Thirdly, the research undertaken in the action learning may use techniques quite different from those advocated by action research. Fourthly, an action researcher could use an action learning set to help him or her to learn from the action research project but does not necessarily do so. According to these differentiations, many action researchers do not have action learning sets and many action learning sets do not use action research.

3.3 Research Methodology

A research methodology, as defined in Section 1.3, is the generic approach of employing one or more research methods to understand and answer the research

questions. According to the discussion in Chapter 2, this research should employ different research methods both to elicit OCAs from management and to extract OCAs from Web sites. These methods include the interview method and manual approach of Web site evaluation. A proper research methodology which is capable of employing these research methods should be chosen in order to answer the research questions and to achieve the three research tasks (evaluation, development, and learning) effectively. The following sub-sections will discuss what methodology should be chosen and what specific design considerations should be taken.

3.3.1 Case study methodology

This research chooses the case study methodology as the research methodology. Benbasat, Goldstein, and Mead (1987) described the case study methodology as the methodology which examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or several entities (people, group, or organisations). There are five reasons which can be used to justify why the case study methodology is proper for this research.

Firstly, the case study methodology can combine different data collection or analysis methods, and even if these methods are both qualitative and quantitative. As Yin (2003) suggested, the case study needs, but not always, different kinds of data collection methods such as interviews, direct, detailed observations, and document and record analysis. Case researchers revealed that the combining of different collection or analysis methods in the case study is valuable (Benbasat et al., 1987; Eisenhardt, 1989; Kaplan & Duchon, 1988). Since this research should employ the interview and Web site evaluation methods to evaluate constructs, the case study methodology is a proper methodology.

Secondly, the case study methodology is viable for study, particularly, in a new area of IS. Benbasat et al. (1987) argued that case study methodology is an appropriate way to research an IS area in which few previous studies have been carried out. The case study methodology gives the researcher an opportunity to learn about the state of the art on the IS in a natural setting. Thus, the researcher can gain valuable insights into the IS area.

Thirdly, the case study methodology is favoured to deal with research questions of how and why (Benbasat et al., 1987; Yin, 2003). This research concerns

how to evaluate the support made to OCAs from Web sites. This includes the tasks, for example, to develop the Prototype OCAWSEM, which includes some tools to generate a shared view of the list of OCAs from the management. Others can adopt the Developed OCAWSEM in the future occasions. In addition, the question of why is also critical in the learning process of this research. For example, why a particular part of the evaluation tool is not appropriate. Thus, the case study methodology is suitable for this research.

Fourthly, the case study methodology is capable of developing the definition and measurement of the constructs (Eisenhardt, 1989). Thus, case study methodology is considered as a proper methodology which can be utilised to develop the definition of OCAs and the OCAWSEM in this research. The definition and measurement of the construct often emerge from the analysis process itself, rather than being specified a priori (Eisenhardt, 1989).

Fifthly, the case study methodology is the primary vehicle for interpretive research in the IS field, and the interpretive case study methodology for evaluation may help participants to identify the important issues to be considered (McBride & Fidler, 2003). As discussed earlier in this chapter, the design of this research is an interpretive approach in the evaluation of support. Barrett and Walsham (2004) suggested that the studied cases based on the interpretive case study methodology can be a key learning for other researchers seeking to develop their own research contributions. Thus, the interpretive case study methodology of this research cannot only generate valuable knowledge, but can also raise important issues of concern to other the researchers.

For these reasons, the case study methodology is suitable for this research. It provides the ability to incorporate various research methods which can be employed to explore the notion of OCAs, to generate the valuable knowledge for the current and future researchers, and to develop an OCAWSEM.

3.3.2 The proper design of the case study methodology

The next issue which should be considered when adopting the case study methodology, is what type of design is proper to adopt for the case study methodology in this research. However, there is no standard design of a case study (Benbasat et al., 1987). The case study methodology can be used to accomplish

various aims: to provide description, test theory or generate theory (Doolin, 1994; Eisenhardt, 1989; Yin, 2003). Each of these four types could use different data collection techniques. Sometimes, researchers have more than one motivation or research purpose in a case study research. Thus, there are various kinds of format of case study research. Yin (2003) suggested three aspects which should be considered when choosing the design for conducting the case study: philosophical, data collection, and unit of analysis aspects. This research chooses proper designs based on these three aspects.

In terms of the philosophical aspect, the case study research can be categorised as positive, interpretive or critical (Klein & Myers, 1999; Myers, 1997). The design of the whole research in this thesis is based on the interpretive paradigm; therefore some relevant principles of conducting the interpretive case study are incorporated into the design of the case study in this research. For example, the interpretive case study is suitable for studying the problems where research and theory are at their early and formative stages (Walsham, 1993); and the interpretive case study does not necessarily attempt to prove or disprove theories (Doolin, 1994).

In terms of the data collection aspect, there are two types of data collection design for the case study, single- and multiple-case design (Yin, 2003). These two types of design are adopted by different rationales. The single-case design is preferred when a single case is the critical, unique, representative, revelatory, and longitudinal case (Yin, 2003). Multiple-case design is desirable when the intent of the research is description, theory building or theory testing (Benbasat et al., 1987). The multiple-case design is chosen in this research. Multiple-case studies consist of several single-case studies. It provides more ability to generalise the results in comparison with the single-case design. Because one major task of this research is to develop an evaluation methodology through an iterative process, the methodology must be applicable not only to a particular case, but to a number of cases. Thus, the multiple-case design is chosen. In contrast, the reason for not choosing single-case design is that the single-case design deals with a "critical" or "specific" organisation and tries to research deeply into it. It does not suit the purposes of this research as this research does not focus on any particular case.

In terms of the unit of analysis aspect, the single-case design and multiple-case design can be either a holistic (single unit of analysis) or embedded (multiple units of

analysis) (Yin, 2003). Each type has its own strengths and pitfalls. For example, as Yin (2003) revealed, the holistic design is advantageous when subunits cannot be found. Yet, it may be conducted at an abstract level, and lack any clear measures. Thus, the case researcher has to choose a proper design to match the research purposes. This research adopts the embedded (multiple units of analysis) design rather than the holistic (single unit of analysis). This is because this research studies the support given to OCAs from Web sites. This must involve the studying of two units – the management who are involved in conducting the OCAs and the Web site which supports the OCAs. Thus, it is an embedded design.

In conclusion, the design of case studies in this research is an interpretive, embedded, and multiple-case design. Because of the multiple-case design, multiple cases should be selected for research. Thus, the case study methodology employed by this research is also termed the "case studies" interchangeably in the later context in this thesis.

3.3.2.1 Iterative learning and developing in case studies

The design of the case study in this research is interpretive, embedded, and multiple-case. As discussed previously, the case studies based on this specific design can utilise various research methods chosen in this research to conduct the evaluation task. However, it is still unsure at this stage whether the other two research tasks – the development and learning – can be achieved in the case studies. As also discussed previously, conducting the case studies in this research should be an iterative learning and developing process. This process is able to generate knowledge from the outcome domain and then to inform the conduct of the evaluation and reflection tasks in the process domain continuously in order to develop the Prototype OCAWSEM. The Prototype OCAWSEM should be gradually improved through this process. Thus, the question posed here is: Is there any design on case studies which can be utilised to conduct this iterative learning and developing process? This section will find the answer to this question.

In terms of the iterative learning process, case studies based on the action research is a common approach to conduct the iterative learning process. Adopting action research in case studies provides researchers more opportunities to learn about the phenomena through an iterative learning cycle. The action research specifically

focuses on middle managers' roles and competencies in the change effort and processes in the organisation (Naslund, 2002). In addition, the action research requires the investigator to promote participation, to engage all those involved in decisions that impact on them and in creating the knowledge that emerges from the inquiry. Then, the case researcher can be co-subject and the subject can be co-researchers (Gronhaug & Olson, 1999; Kotnour, 2001; Reason, 2004). However, none of these are the focus of this research. Instead, this research sees a case researcher as an independent observer during the data collection process who has a eminent role in defining the evaluation questions and relevant data categories (Westbrook, 1994; Yin, 2003). As an observer only, the case researcher is not involved in dealing with the change efforts or the processes in the case organisation. Thus, it is not suitable to this research.

In terms of the iterative developing process, case researchers have been conducting the iterative developing process to develop a number of prototypes, such as measurement tools and interview questions. This process in case studies can be conducted in three types: within the case study, between the cases, or both.

The first type is to conduct the iterative developing process within the case studies. The process is frequently seen in the data analysis stage. For example, Sudweeks and Simoff (1999) suggested using qualitative refinement iteratively to modify the coding scheme, and amend categories and terms in the case studies. Incorporating the grounded theory process (Glaser & Strauss, 1967) into case studies is another proper approach to improve the results in the data analysis iteratively. However, the emphasis of grounded theory on the establishing relationships between categories that proceeds to increase complexity by including context (Walker, 1985) is not the focus of this research. Thus, the grounded theory is not appropriate to this research.

The iterative developing process conducted within a case study can also be in other stages in a case study. For example, when utilising the grounded theory, the researcher is constantly moving back and forth between coding and analysing data, and inspecting the data for new properties and theoretical categories at every stage in the research (Fowler & Jeffs, 1998; Pappu & Mundy, 2002). The iterative developing process within a case study can be also conducted to develop the definition and measures of a construct (e.g. interview questions, survey). For example, Luftman, Papp, and Brier (1999) noted that several iterations were necessary to identify and

modify ambiguous and troublesome interview and survey questions. This iteration process is often employed in a pilot study before the questions are given to the actual participant of that research. Churchill (1979) also believed that this iteration is required in the developing process of construct measures.

The second type is to conduct the iterative developing process between multiple cases. This can be used for improving the IS design methodology (e.g. Milton, Johnston, Lederman, & Waller, 2005) and IS evaluation forms (e.g. Hung & McQueen, 2004). Milton, Johnston, Lederman, and Waller, (2005) suggested employing a series of case studies to develop an initial methodology for designing situational systems. Through the iterative developing process, extra guidelines and appropriate representational analytical tools are added to improve the methodology. Hung and McQueen (2004) also confirmed that the iteration between cases helped improve the guidelines in the prototype Web site evaluation forms.

The third type is to conduct the iterative developing process both within the case and between the cases (e.g. Lawless & Moore, 1989; Machemer & Kaplowitz, 2002). These studies are highly iterative in comparison with the two types of studies discussed above. The iterative developing process includes the iteration (e.g. comparison and revision) between the initial theoretical statement and the findings in the first case, and iterates this "iteration" in the second, third or more cases. Sometimes, the selection of proper cases in order to match the purposes of the research should be reconsidered if the process tends to confirm the propositions (Eisenhardt, 1989; Lawless & Moore, 1989). It is also possible to repeat the whole process many times if needed (Yin, 2003).

To demonstrate the third type, for example, Lawless and Moore (1989) described their work based on six case studies. They used the first two to capture the key relationships and behaviours, and to descriptive propositions. Then, these propositions were iteratively confirmed, disconfirmed or adapted to data from additional cases. They concluded that the final set of propositions applied to all six cases. Machemer and Kaplowitz (2002) also adopted a similar approach. They conducted a series of iteration of coding and categorising the case study data and developed an evaluative framework to categorise fourteen transferable development rights programmes. Then, this evaluation framework was used to evaluate three

programmes which were recognised as having some similarities in order to test the efficacy of the derived evaluative framework.

These three types of iterative developing process tend to achieve different purposes. The first type, the iterative developing process conducted within the case study, is concerned more with establishing the construct validity. Eisenhardt (1989) believed that the researcher is attempting to establish construct validity through this type of iterative developing process. In addition, this type of iterative is critical in building theory from case studies because it has a strong focus on the data analysis process within a case (Eisenhardt, 1989). The second type, the iterative developing process conducted between cases, has more relevance to the applicability. As Milton, Johnston, Lederman, and Waller (2005) commented, this type of iterative developing process is to ensure that the final methodology is adaptable to other contexts, and also helpful to define any limits to the methodology's applicability. The third type, the iterative developing process conducted within the case and between cases, not only establishes the construct validity and applicability, but also is suitable to explanation building and deep exploration (Yin, 2003).

In a summary of the discussion in this section, the case study literature does show that the case studies can be and have been an iterative learning and developing process to develop methodologies. Conducting the iterative learning and developing process can provide researchers with the benefits of more learning opportunities, enhancing both the validity and applicability of the methodologies, and having explanation building and deep exploration. Although the literature suggests three types of iterative developing process, the literature does not provide clear design guidelines on how iterative learning and developing process can incorporate the interview method and Web site evaluation method in the cases to achieve the three research tasks included in this research. A proper design for conducting the case studies in this research is still missing.

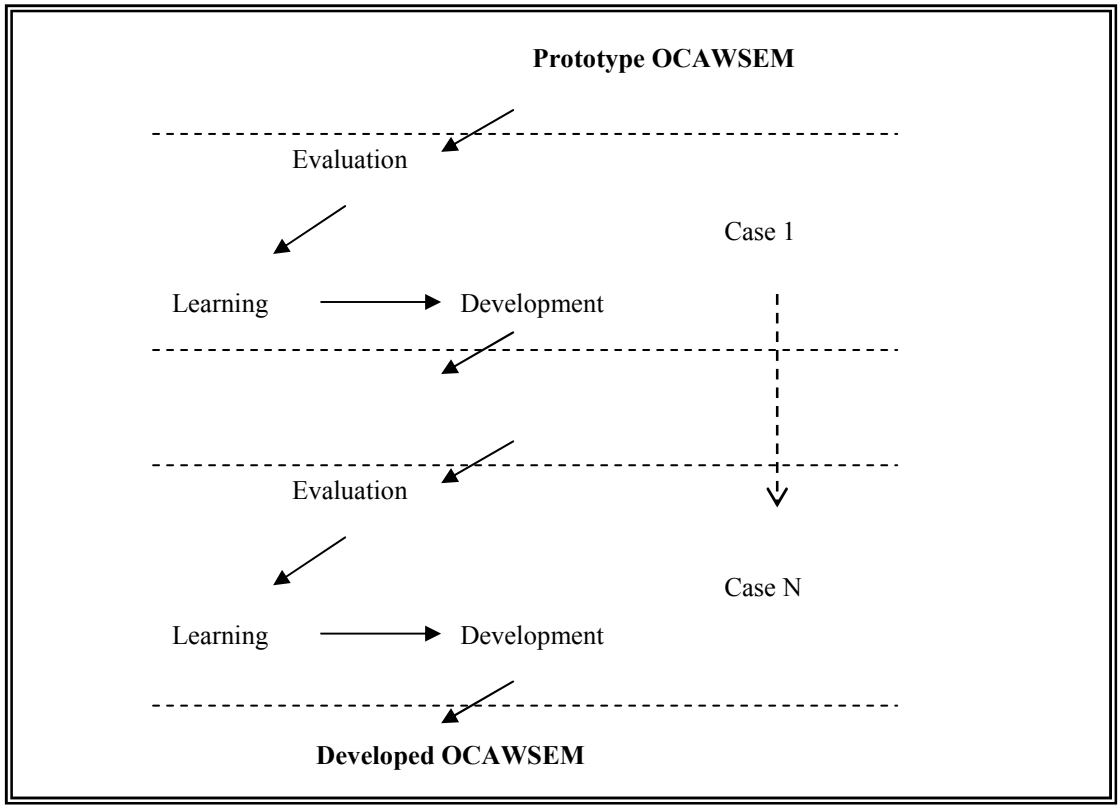
3.3.2.2 ICD in this research

This thesis proposes a specific type of multiple-case design to incorporate the interview method and Web site evaluation method in the cases to achieve the three research tasks in this research, which are evaluation, development, and learning. This specific type of design is named iterative case design (ICD). The ICD is defined as:

A research design which utilises a series of case studies through an iterative learning cycle to develop a prototype.

It is a design which utilises the iterations in the cases and between the cases. The ICD of this research can be demonstrated by Figure 3.2.

Figure 3.2 *ICD of this research*



This figure shows how a series of case studies can be employed in the iterative learning process for the development of the OCAWSEM. In each case, there are three tasks; evaluation, learning, and development. However, there is a sequence for achieving these tasks as shown in Figure 3.2. The reason for this sequence is based on the logic of conducting the action learning (McGill & Beaty, 1995) which has been discussed previously. The whole process of the ICD can be seen as an action learning process. The four phases in the action learning process; experience, reflection, generalisation, and testing, can be matched with the three tasks. The testing and experience phases are conducted to achieve the evaluation task; the experience and

reflection phases are conducted to achieve the learning task; and the reflection and generalisation phases are conducted to achieve the development task. Using the sequence of the four phases in the action learning process, the sequence of task achievement of the three tasks is evaluation, learning, and development in the case studies.

Four principles of conducting the case studies based on the ICD in this research are identified here. Firstly, the researcher is absent in the participation of the practical operations of the cases. This is because the ICD is a multiple-case design of case study. Due to the nature of case study, the researcher is an observer rather than a participant in the field cases.

Secondly, the ICD utilised in this research does not focus on comparison of the findings. Comparison of the findings between cases is a critical task in most multiple-case studies. The major benefits are to elicit the variances between cases, and if possible, provide valuable explanations on the causes of these variances. However, as discussed previously, the Prototype OCAWSEM is being developed and improved through the case study process. It will not be reliable in the earlier cases. Thus, the results produced from the earlier cases are not reliable enough to be compared.

Thirdly, a reflection stage must be conducted in each case study. The ICD utilised in this research is based on the action learning approach. As a reflection stage is critical to action learning, it is also critical to the ICD. During the reflection stage, the researcher reflects on two types of findings. One is what lessons have been learned, the second is what improvement should be made to the Prototype OCAWSEM. In addition, these lessons and improvements should be presented clearly in the final case report because they are part of the "knowledge" outcome in the outcome domain in the OCAWSEM Development Process.

Fourthly, the judgement on the end point of the case study process, which is based on the ICD, has two aspects – learning and development. In terms of learning, the ICD shares the same agreement with a typical multiple-case design that is concerned with certainty (Yin, 2003). The researcher keeps comparing between the findings in the current case with findings in a previous case in order to seek any new lesson to be learned in the current case. The process is stopped where no more new insights can be obtained from a case situation (Wester & Peters, 2000). In terms of development, the process is stopped when the quality of the Prototype OCAWSEM is

enhanced to a desired point. More detail on deciding the end point of the case study process will be discussed in Section 3.4.4.3.

3.4 Research Framework

This section will describe a research framework based on the ICD to develop the Prototype OCAWSE, and then to test the Developed OCAWSEM. It will shortly discuss the selected field cases, the reasons for choosing them and the stages included in this research framework.

3.4.1 Field cases

This research used all the eight universities in New Zealand as the field cases. The intention in choosing the entire population was to ensure that the quality of the Prototype OCAWSEM was improved as much as possible and the Developed OCAWSEM would be a valid and reliable methodology for evaluating the support given to OCAs from the Web sites. Summaries of the backgrounds of these field cases are given in Appendix 3.

There are three reasons to justify why the universities in New Zealand are appropriate for the field cases of this research. Firstly, all universities in New Zealand have Web sites. Thus, it is able to utilise the Prototype OCAWSEM to evaluate the support given to their OCAs from Web sites, and then to improve the Prototype OCAWSEM. This is the most fundamental criterion for choosing the cases for this research.

Secondly, university Web sites in New Zealand are one of the best practices for other industries. Thelwall and Wilkinson (2003) studied the structure of university Web sites in three countries including New Zealand. The results showed that the Web sites in New Zealand universities include thousands of Web pages and a variety of sophisticated features. These Web sites are significantly resourced in comparison with some other SMEs, and more sophisticated. Thus, studying the support made from these Web sites can generate useful lessons for organisations in other industries, which do not have a significant size of budget to invest on Web sites to improve the design of their Web sites.

Thirdly, education export is the fourth largest service sector export earner for New Zealand due to the growing number of overseas students since 1999 (*New Zealand Exports of Education Services*, 2000). The government considers that strategically utilising e-commerce in the education sector is one of the key priorities to economic transformation (*E-Commerce: Building the Strategy for New Zealand Progress Report, One Year On*, 2001). The study of the support given to OCAs from Web sites for New Zealand universities therefore will provide substantial findings to improve the e-commerce practices in the universities and other organisations, and provide a contribution to the country's economic transformation.

The first seven of the eight case studies were used in the OCAWSEM Developing Process, which was used to develop the Prototype OCAWSEM. They are "Developing Case Studies" in this thesis. While conducting the Developing Case Studies, critical improvements were made to the Prototype OCAWSEM. A number of useful lessons have also been learned.

The eighth case study was conducted in order to test the quality of the Developed OCAWSEM. This case study is termed "Testing Case Study" in this thesis. The Testing Case Study is different from the Developing Case Studies which are utilised in the OCAWSEM Developing Process. Firstly, more interviewees from the senior management participated in the studies. Secondly, an overall assessment of the methodology was conducted. The Testing Case Study not only conducted the evaluation, development, and learning tasks, but also conducted an overall assessment of the quality of the Developed OCAWSEM whereas the Developing Case Studies only conducted the evaluation, development, and learning tasks.

The results from the eight case studies confirm the decision made on utilising the first seven case studies in the OCAWSEM Developing Process and the eighth case study in the OCAWSEM Testing Process. This is because the Prototype OCAWSEM was improved only in the first seven case studies, which became the Developing Case Studies. There was no improvement made in the eighth case study, which became the Testing Case Study.

When conducting the case studies, data collection and analysis are two broad aspects which should be considered (Yin, 2003). Moreover, the case studies based on the ICD should conduct the reflection stage between the cases. In total, each of the Developing Case Studies includes three stages: data collection, data analysis, and

reflection. The Testing Case Study not only includes these three stages, but also another one – the testing stage. The purpose of this stage is to conduct an overall assessment of the quality of the Developed OCAWSEM. The details of each of these four stages will be presented in the following sections.

3.4.2 Data collection stage

The data collection stage includes conducting two tasks. The first is semi-structured interviews with the management staff members in the case in order to elicit lists of OCAs. Then the manual Web site evaluation was carried out to extract which OCAs were supported by the Web site.

3.4.2.1 Task 1 – semi-structured interviews

One data collection technique employed is the semi-structured interview. In general, there are three common interview types: structured, semi-structured, and unstructured. This research chose the semi-structured interview to elicit OCAs from management. The semi-structured interview has the major advantages of both structured and unstructured interviews (Bryman, 2001; Flick, 2002; Taylor & Bogdan, 1998). On one hand, it requires the interviewer to ask identically worded questions to assure comparable findings; on the other hand, more open questions are brought to the interview which allows the interviewer an opportunity to explore the social phenomenon in depth. The semi-structured interview is adequate to achieve the objectives of data collection in this thesis because it helps identify a list of OCAs through a list of structured questions and to understand the notion of OCAs through some unstructured questions from the interviews.

The emerging difficulty faced in regard to identifying a list of OCAs from the management is how to reach a coherent view among the interviewees. Morgan (1993) found that practitioners are less likely than academicians to reach consensus in terms of system designs. The Delphi technique (Dalkey & Helmer, 1963), in particular incorporated with face-to-face confrontations (Gokhale, 2001), is a popular method to reach a consensus on the priorities among a group for decision-making (e.g. Gokhale, 2001; Huang, Chang, Li, & Lin, 2004; Lai, Wong, & Cheung, 2002; Luftman, 2000; Madu, Kuei, & Madu, 1991). It seems that it can serve to achieve the purposes of this research well. However, it is important to note that this research not only needs to

identify a list of OCAs, but also to develop an OCAWSEM which can be used by the management to measure whether they have a coherent or variant view on their OCAs. The Delphi technique is not capable of achieving this end because the variations among the interviewees on the lists of OCAs are compromised through a continuing negotiation process toward a consensus. Thus, this research only utilised semi-structured interviews as the data collection method to elicit lists of OCAs from management.

Theoretically, it is necessary to interview all management members in each case in order to generate an unbiased view of OCAs. However, this is unnecessary in practical terms. This is because one of the major objectives of this research is to develop an OCAWSEM. Then, others can possibly adopt this methodology in the future to interview all management staff members. Therefore, it tries to develop an evaluation methodology which is adaptable to other organisations rather than to elicit a complete view on the OCAs in any case. Thus, only a small number of management staff members were interviewed. They were selected from three levels: senior, middle, and bottom.

The senior level of management has the responsibility to lead the university strategically. Therefore, they should be more able to share what OCAs are in the university. In addition, they are also responsible to pass the strategic information to the middle level management. They should have the most influence on defining OCAs for the university, but the least influence on the Web design. The middle level should be intermediary, passing the strategic information to the bottom level, the Web Team. Although they may be not directly involved in the technical design of the Web site, they know more about the Web design and have more influence on it than the senior level. The bottom level should be responsible for implementing the strategic information onto the Web site. They have the least knowledge on the OCAs, but the strongest influence on the Web design. The numbers of management staff members interviewed in the cases are listed in Table 3.2 (see next page).

Table 3.2 *The management staff members in each level interviewed in the cases*

	Interviewees in Each Level			
Case	***Senior***	***Middle***	***Bottom***	***Totals***
1	1	2	1	4
2	2	2	2	6
3	1	3	2	6
4	2	2	1	5
5	1	2	2	5
6	2	1	2	5
7	2	1	2	5
8	3	2	2	7
Totals	**14**	**15**	**14**	**43**

Table 3.2 shows that, in total, 43 management staff members were interviewed in the eight universities. In each case, at least one staff member was chosen in each level. There were 14 from the senior management, 15 from the middle and 14 from the bottom. The titles of the interviewees in each level include:

1. Senior level: the senior managers in the senior management team, which include, the VC, DVC, Assistant VC, and Director of Strategic Planning;
2. Middle level: the general managers in the functional departments, which include the IT Director, Marketing Manager, Marketing Assistant, Research and Enterprise Officer, Group Manager of Public Affairs, External Relations Office Manager, and Project Manager;
3. Bottom level: the members in the Web Team, which include the Web Manager, Web Project Manager, Web Content Manager, Chairman of Web Advisory Committee, Web Designer, Internet Service Manager, and ITS Project Manager.

Two common interviewing techniques were available: face-to-face, and telephone. As suggested by Zikmund (1997), telephone interviews are more impersonal than face-to-face interviews and there is a greater tendency to record incomplete answers. In addition, it would be difficult for the interviewee to discuss issues from visual materials. In line with the suggestion, the interviewees were sought for their agreement to face-to-face interviews first. If the interviewee did not agree to conduct a face-to-face interview nor had difficulties in being reached physically, a telephone interview was the other option.

During each interview, the definition of OCAs and the questions listed in the OCAWSEM were utilised to conduct a series of discussions with the interviewee.

This discussion included giving the definition of OCAs to the interviewees, asking them to generate a list of OCAs of the university and requesting them to prioritise their lists of OCAs in terms of how critical each of them is to the university. Some follow-up questions were also posed during the interview if needed.

Both face-to-face and telephone interviews were recorded by a high-quality digital recorder and microphone. Bryman (2001) suggested that a high quality microphone is desirable to ensure the quality recording in interviews. Field and reflection notes were also taken during and after the interviews. As suggested by Debu and Pare (2003), field notes should be as complete as possible, including both verbal and nonverbal communication and descriptions of the context of the conversations. Thus, each interview had notes on the context revealed by the interviewee, the pictures, the diagrams, and the material shown by the interviewee during the interview. After the interview, any thoughts in regard to the issues mentioned by the interviewee were also noted.

Because this research is to develop and improve the Prototype OCAWSEM through a series of case studies based on the ICD, the definition of OCAs was modified and some new questions were added into the OCAWSEM during the case study process. Chapters 4 and 6 will present and discuss these detailed improvements and the actual questions and definitions utilised in the cases. This section has provided an overview of the settings of the semi-structured interviews in the cases.

3.4.2.2 Task 2 – the manual Web site evaluation

The other data collection technique employed in the data collection stage is the manual Web site evaluation. This is to extract what OCAs the university Web site is supporting, and how effective and efficient the support is. The data collection process of the manual Web site evaluation is mainly based on the evaluation process and the Web Site Evaluation Forms included in the OCAWSEM. The details of these process and forms included in the Prototype OCAWSEM can be found in Appendix 1. The discussions on how they have been developed can be found in Section 3.1.1. During the case studies, these process and forms were improved. Chapters 4 and 6 will present and discuss these detailed improvements and the actual process and forms utilised in the cases. However, this section will only discuss the process and the forms included in the Prototype OCAWSEM from an overall perspective. The data

collection process of the manual Web site evaluation in the Prototype OCAWSEM has three stages; termed Stages 4, 5, and 6.

Stage 4 is the Web Background Investigation. This is to allow the evaluator to become familiar with the Web site. This research adopts the approach utilised in the study of Lin, Yang, Tan, and Chang (2002). They treated a Web site as the aggregation of Web pages which can be accessed from the Internet, intranet, and extranet. This research uses this definition. The Web pages accessed from the Intranet include those Web pages which can be accessed by any users and are password free. The Web pages accessed from the Intranet include those Web pages which can only be accessed by employees of the university and are password protected. The Web pages accessed from the extranet include those Web pages which can only be accessed by the students and external suppliers of the university and are password protected. In this phase, the evaluator was asked to browse the Web site, answer three general questions, and then recorded the results onto Web Site Evaluation Form 1. These three questions were:

1. Does the Web site comprise Internet, intranet(s) and extranet(s) Homepages?
2. Is a password required to access the Internet, intranet(s), and extranet(s)?
3. What are intended user groups of the Web site?

Stage 5 is the OCAs Confirmation and Generation. This requires the evaluator to click on the hyperlinks on the university Homepage, and then follow the hyperlink to other sub-sites. Then, the evaluator recorded what OCAs the hyperlink supports on the Web Site Evaluation Form 2. This process was repeated to evaluate intranet and extranet Homepages. The Prototype OCAWSEM provides instructions to this step. In addition, the Prototype OCAWSEM also provides an OCA Repository, which contains a list of possible OCAs in the universities in New Zealand. It is based on:

1. The generic dimensions of OCAs identified from the literature;
2. The study of Robb, Shanahan, and Lord (1997). They presented a wide range of activities within New Zealand tertiary institutions from the comparative analysis of activity-based management in five institutions.

The evaluator could save time on matching what activities the sub-site supports and then whether these activities are OCAs. A university Web site could support

thousands of business activities. By using the OCA Repository, the evaluator can narrow down the matching tasks on those activities listed in the repository first, and the other activities second. Because the activities in the OCA Repository are common OCAs, it can assist the evaluation to become more efficient by saving the time in judging whether these supported activities are OCAs. If all the activities supported by the Web site can be found in the list, the time spent on judging whether these activities are OCAs can be saved.

Stage 6 is Analyse Effectiveness and Efficiency. The purpose of this stage is to assess how effective and efficient the support received from the Web site for each OCA was. It is important to notice that this phase only concerns on the support made to *each* OCA rather than the support made to *all* OCAs overall. The evaluator is required to use the Web site to conduct one OCA listed in the Web Site Evaluation Form 3. The Web site includes all the Web pages linked by the Internet, intranet, and extranet. This support was measured based on the two criteria which have been chosen in the Chapter 2:

1. Informativeness: How informatively is the activity supported by the sub-sites? This can be measured by the numbers of sub-sites and how much information in total supports the activity.
2. Interactivity: How interactively is the activity supported by the sub-sites? In other words, how sophisticated are the features on the sub-sites in supporting the activity?

The criterion informativeness is used to evaluate how effectively the Web site supports an OCA. There are three levels of informativeness.

1. High: More than ten sub-sites and each sub-site contains information three times the length of the screen (with 1024 x 768 resolution screen display) on average to support the OCA.
2. Medium: Includes five to ten sub-sites or more than ten sub-sites but with information less than three times the length of the screen on average in each sub-site to support the OCA.
3. Low: Less than five sub-sites to support the OCA.

The interactivity is used to evaluate how efficiently the Web site supports an OCA. There are also three levels of interactivity.

1. Level 1: The feature provides static information to support conducting the OCA.
2. Level 2: Not only information provision, the feature also provides at least one-way communication between users and the university when conducting the OCA, for example, online form, and FAQ.
3. Level 3: Not only information and communication functionality, the feature also provides data transaction between users and the university when conducting the OCA, for example, search function.

The typical examples of the features in each level described here are contained in the Prototype OCAWSEM. During the case study process, more features, which belong to each of the levels, have been identified and added into the above instructions. More discussion on these new features will be presented in Chapter 4. All the evaluation results are recorded in the Web Site Evaluation Form 3.

However, three issues have been identified and considered in regard to the domain of the Web site for evaluation. This is because the university Web sites usually include several thousand Web pages and are much more complicated than most of the SME (Small and Medium Size Enterprises) Web sites. These issues are discussed below.

The first issue is: What levels of sub-sites need to be evaluated by this research? According to the evaluation process provided in the Prototype OCAWSEM, this research requires the evaluator to determine which OCA each sub-site in the university Web site is supporting. This requires the evaluator to evaluate the content on the front page of the sub-site, to click all the links in the sub-site, to go to the next level of sub-site, and then to evaluate all the content and links there again. This process should be continued until the evaluator reaches the "individual page" (Thelwall, 2003) or the "terminal page" (Gillenson et al., 2000). However, one university Web site could contain hundreds of sub-sites and thousands of individual pages. Because this research adopts the manual Web site evaluation, it is very time-consuming for a single evaluator to evaluate all of the individual pages in the university Web site manually.

In addition, some groups of sub-sites only support very low-level activities which support certain OCAs. For example, a Web site may contain hundreds of sub-sites to provide the product catalogues to customers. This has less value for this research to evaluate the entire sub-sites under the product catalogue sub-site in detail, because they are all supporting the advertising activity. Thus, the levels of sub-sites to be evaluated should be defined.

As discussed in Chapter 2, previous Web site evaluation researchers (Gillenson et al., 2000; Thelwall, 2003) have suggested shifting the focus from the individual Web pages to the topic (or called community) in the aggregated Web pages. These Web pages in the same topic share a common theme. In addition, these researchers made clear decisions on what levels of sub-site they would evaluate. In line with their suggestions, this research only evaluated the content of the second level of sub-sites from the Homepage, which include:

1. All the content and links which are on the Homepage;
2. All the content and links which are on the first level of sub-site (Internet, extranet and intranet sub-sites) referred by the link on the Homepage; and
3. All the content and links which are on the second level of sub-site (Internet, extranet, and intranet sub-sites) referred by the link on the first level of sub-site (Internet, extranet, and intranet sub-sites).

The second issue is whether the sub-site, which is owned by other organisations but referred by the link from the university Web page, is considered as a sub-site supporting the OCA of the university. One of the advantages of Web sites, in comparison with other type of media, is that different sub-sites can be interlinked. This research only evaluates those sub-sites owned or partly-owned by the university. Thus, the sub-sites which are fully owned by other organisations were excluded from the evaluation.

The third issue is whether the sub-site, which is owned by the academic departments of the university, is considered as a sub-site supporting the OCA of the university. Because this research concerns the OCAs for the university rather than for the academic departments, these sub-sites which are owned and maintained by the academic departments were excluded from the evaluation. Although it is arguable that the university includes the academic departments, the university also owns these

departmental sub-sites. However, those sub-sites owned and maintained by academic departments support the academic departments' OCAs rather than the university's OCAs. Unless they are referred to by the links located on the university level sub-sites for supporting the university's OCA, they are excluded from the evaluation.

3.4.3 Data analysis stage

The data analysis stage aims to analyse the data produced from the data collection stage. Specifically, this stage needs to achieve three objectives. Firstly, it needs to generate a list of prioritised OCAs and understand the notion of OCAs from analysing the semi-structured interview data. Secondly, it needs to generate a list of prioritised OCAs from the data collected from the manual Web site evaluation. Thirdly, it needs to analyse and discuss the variance between these two lists of OCAs, and to make suggestions on how to reduce that variance.

To achieve these three objectives, the data analysis stage is divided into three steps. The first step is the analysis of the semi-structured interview data, which is purposely conducted to achieve the first objective – to generate a list of prioritised OCAs and understand the notion of OCAs from analysing the semi-structured interview data. The second step is the analysis of the manual Web site evaluation data, which is conducted to achieve the second objective – to generate a list of prioritised OCAs from the data collected from the manual Web site evaluation. The third step is the overall support discussion, which is conducted to achieve the third objective – to analyse and discuss the variance between these two lists of OCAs, and to make suggestions on how the variance between them can be reduced. The details of these three steps will be discussed in the following three sections.

3.4.3.1 Step 1 – analysis of the semi-structured interview data

The first step in the data analysis stage is the analysis of the semi-structured interview data. The purpose is to identify a list of OCAs and to explore the understanding of OCAs from the semi-structured interview data. The literature widely accepted that the analysis of qualitative data is a process which reduces unnecessary data, elicits important data through an appropriate coding process, and integrates, synthesises, and verifies the data to construct the desired theory (Glaser & Strauss, 1967; Miles & Huberman, 1994; Wester & Peters, 2000). In regard to a profounder analysis, it is

necessary to re-read data in complete transcripts, in field notes, and in categorised sections, over and over again (Barry, 1998).

This research was based on five phases to analyse the semi-structured interview data; presentation, exploration, reduction, integration, and prioritising. Useful tools and techniques were also utilised during these phases to assist the analysis. The tools and the techniques utilised in each of the five phases are presented in Table 3.3.

Table 3.3 *Tools and techniques utilised in the phases of interview data analysis*

No	Phases	Tools and Techniques Utilised in the Phases
1	Presentation	Digital recorder, Transcribing software
2	Exploration	Thematic coding technique, NVivo computer software
3	Reduction	Thematic coding technique, NVivo computer software
4	Integration	Thematic coding technique, NVivo computer software
5	Prioritising	Prioritising principles in OCAWSEM

The first is the presentation phase. This is to transcribe and present all interview data into a readable and manageable format. The interview data, which was digitally recorded, was uploaded to a computer to be played by specific transcribing software. This software allows replaying the interview, repeating particular sentences, and slowing down the speech speed. If necessary, the interviewees were requested again to clarify uncertain terms or meanings which could not be recognised during the transcribing.

The second is the exploration phase. Kvale (1996) suggested that the analysis of interview results means to fragment the material into separate parts – the single paragraphs, sentences or words. Therefore, this phase is to categorise the interview transcription, and field and reflection notes, into as many relevant categories as possible. The category can be a word, a sentence or a paragraph. They serve to generate lists of possible OCAs and knowledge for understanding the notion of OCAs.

As shown in Table 3.3, the thematic coding technique was utilised to assist the data analysis in the exploration phase and the next two phases. The discussion of how a list of themes and codes developed in this research is shown in Appendix 4. The NVivo computer software was also utilised to assist the data analysis. The purpose was to help the researcher conduct a thematic coding process on the semi-structured

interview data. The NVivo computer software is a type of content analysis software which can help qualitative researchers search the passage, compare the passages, and change the code easily (Carley, 1994; Gibbs, 2002). Utilising NVivo in the coding process in this research reduced coding time, and enabled the analysis of larger numbers of texts easily and efficiently. Furthermore, NVivo assists the researcher to search for and extract both explicit and implicit passages from the text.

However, it should be noted here that the NVivo computer software is used to assist the researcher in referring back to the text efficiently and effectively rather than being used as the main analysis tools on the text. This is suggested by Gibbs (2002) as using the software to retrieve and manage the words, phases, passages, and codes only. Moreover, the thematic coding also tends to link detailed concepts with text only (Sivesind, 1999).

The third is the reduction phase. The purpose is to reduce the number and the size of the categories in each interview into a succinct and summarised format in order to be analysed efficiently in the next phase. The activities in this phase include summarising, deduction on repeated categories, and memo developing.

The fourth is the integration phase. In this phase, some relevant categories across all of the interviews are merged into a generic category. Similar to the previous phase, this phase also reduces the size of the text. Yet, it focuses more on the cross comparison between categories in different interviews. The activities in this phase include deduction on the repeat concepts, searching for consensuses, and contradictions and summarising the broad categories.

The fifth is the prioritising phase. This is to generate and prioritise a final list of OCAs to represent the view from the management by utilising the Interview Prioritising Principle which is that the activity as nominated by more interviewees is more critical. This is the only principle for this phase in the Prototype OCAWSEM. Some more Interview Prioritising Principles have been added into the Prototype OCAWSEM during the case study process, which will be discussed in Chapter 4s and 6.

3.4.3.2 Step 2 – analysis of the manual Web site evaluation data

The second step in the data analysis stage is the analysis of the manual Web site evaluation data. The purpose of this step is to identify the priority of the list of OCAs

which are being supported by the Web site. In comparison with the analysis of the semi-structured interview data, the Prototype OCAWSEM provides much more detail, such as the evaluation guidelines and the Web Site Evaluation Forms, on how the manual Web site evaluation data can be analysed. Previously, Chapters 2 and Section 3.1 provide a thorough discussion of the theoretical foundations of these guidelines and forms. Thus, this section will not repeat the discussion here. This section will discuss two stages conducted in the second step of the analysis of the manual Web site evaluation data, Grouping and Prioritising. They are used to guide the use of the evaluation guidelines and the Web Site Evaluation Forms.

The first stage is the Grouping. The purpose of this stage is to group the OCAs listed in the Web Site Evaluation Form 3 in the Prototype OCAWSEM based on how effectively and efficiently they are supported by the Web site. By grouping these OCAs, their prioritising will become easier. Thus, this phase can be considered as a preparation phase before the Prioritising stage.

There are five categories representing how effectively and efficiently the Web site supports the OCAs. The results of grouping are recorded in the Web Site Evaluation Form 4. The names of the categories, instructions and how to group OCAs into each one of them are listed as follows:

1. Category 1: The Web site provides effective and efficient support to the OCA. Any activity, which is recorded as High and Level 3 in the Web Site Evaluation Form 3 in the Prototype OCAWSEM, belongs to this category;
2. Category 2: The Web site provides effective or efficient support to the OCA. Any activity, which is recorded as High and Level 2 or Medium and Level 3 in the Web Site Evaluation Form 3 in the Prototype OCAWSEM, belongs to this category;
3. Category 3: The Web site provides general support to the OCA. The rest of OCAs supported by the Web site and not Low and Level 1 in the Web Site Evaluation Form 3 in the Prototype OCAWSEM, belongs to this category;
4. Category 4: The Web site provides poor support to the OCA. Any activity, which is recorded as Low and Level 1 in the Web Site Evaluation Form 3 in the Prototype OCAWSEM, belongs to this category;

5. Category 5: The Web site does not provide any support to the OCA. Any activity, which is recorded as not being supported by the Web site in the Prototype OCAWSEM, belongs to this category.

The second stage is the Prioritising. The purpose of this stage is to prioritise the OCAs which have been grouped in the previous stage and recorded in the Web Site Evaluation Form 4. In this stage, those OCAs, which were both nominated by the interviewees and listed in the Web Site Evaluation Form 4, were separated. Those separated OCAs represent the OCAs which were nominated by management as OCAs to the university and also were being supported by the university Web site. Then, those separated OCAs are prioritised. Two Web Prioritising Principles can be utilised. The first is that the OCA in the higher category has higher priority than one in the lower category. As discussed in the previous phase – the Grouping stage - the purpose was to group the OCAs listed in the Web Site Evaluation Form 3 in the Prototype OCAWSEM based on how effectively and efficiently they are supported by the Web site. Five categories have been identified for the support:

1. Category 1: The OCAs categorised into this category are those effectively and efficiently supported. They are ranked as High and Level 3 in the Web Site Evaluation Form 3;
2. Category 2: The OCAs categorised into this category are those effectively or efficiently supported. They are ranked as High and Level 2 or Medium and Level 3 in the Web Site Evaluation Form 3;
3. Category 3: The OCAs categorised into this category are those generally supported. They are the OCAs supported by the Web site, are not ranked as Low and Level 1 in the Web Site Evaluation Form 3 and are not in Category 1 and 2;
4. Category 4: The OCAs categorised into Category 4 are those poorly supported. They are ranked as Low and Level 1 in the Web Site Evaluation Form 3;
5. Category 5: The OCAs categorised into Category 5 are those non-supported. They are not supported by the Web site.

According to these five categories, the OCA categorised into higher category (with smaller number) has higher priority than the one categorised into the lower category (with large number).

The second Web Prioritising Principle is "the activity, which is supported by more sub-sites, has higher priority". This principle is used to decide the priority for two or more separated OCAs which belong to the same category in the Web Site Evaluation Form 4. For example, the OCAs A and B were both nominated by the management as OCAs. They were both supported by the Web sites and were categorised into Category 1 in the Web Site Evaluation Form 4. Applying the first Web Prioritising Principle cannot prioritise the OCAs A and B because they are in the same category. The second one should be applied, that is, "the activity, which is supported by more sub-sites, has higher priority". These two Web Prioritising Principles can be both found in the Prototype OCAWSEM.

During the case study process, new principles have been found to deal with the difficulties faced when prioritising the OCAs supported by Web sites. These new principles have been added into the Prototype OCAWSEM. They will be discussed in Chapter 4.

3.4.3.3 Step 3 – overall support discussion

The third step in the data analysis stage is to discuss the overall support made to the OCAs from the Web site. This step is conducted after analysing both interview and Web site evaluation results. The instruction for conducting this step can be found in Stage 9 – Overall Support Discussion in the Prototype OCAWSEM.

There are two tasks in the overall support discussion. The first task is to assess how well the Web site supports the OCAs which were nominated by the interviewees, overall. This requires comparing the two lists of OCAs developed from both interview and Web site evaluation results. The discussion of overall support includes two aspects: support and priority. In terms of support, the Web should provide support to those OCAs which were nominated by the interviewees. In terms of priority, the priority of OCAs given by management should be the same as the priority of the OCAs which were derived from the Web site evaluation.

Judging how overall support the Web site given to the university's OCAs, both of these two aspects have to be considered. For example, the interview result

shows that University A has three OCAs. Based on the priority, they are Activity 1, 2, and 3. If the university's Web site fully supports these three activities, the Web site should support these three activities and also provide most support to Activity 1, the second to Activity 2 and least to Activity 3.

The second task of the overall support discussion is to provide recommendations for improving the Web designs if the OCAs, which were nominated by the interviewees, are not fully supported by the Web site. In order to achieve this end, the Overall Support Display Diagram is utilised. Then, one must assign those OCAs, which were nominated by the interviewees, into the diagram based on the results recorded in the Web Site Evaluation Form 4. Because OCAs are critical to the university's success:

- The Web site should support the OCAs which were nominated by the interviewees;
- If an OCA is fully supported by the Web site, the priority given by the management and the priority of the support extracted from the Web site evaluation should be the same; and
- The Web site should provide as much support as possible to the OCAs which were nominated by the interviewees.

Thus, any OCA which is prioritised differently between the interview results and the Web site evaluation results should be identified. If the OCA is supported with a lower priority by the Web site, the recommendation should consider how an enhancement can be made to the Web site in order to lift the support given to this activity from the Web site to the priority which is expected by the management: for example, by adding more information to support the OCA or integrating more interactive features to support the OCA. If the OCA is being supported with highly informative and interactive sub-sites, then the university has to consider whether they can relocate the resources which are planned to improve the support made to this activity to other poorly supported OCAs. In addition, any OCA which is not being supported in the highest levels of effectiveness and efficiency should be identified as well. Then, the Web site should provide as much support as possible to them because these OCAs are critical to the university's success. According to these discussions, useful

recommendations can be drawn up to help the university redesign its Web site to highly support these OCAs.

3.4.4 Reflection stage

Conducting the reflection stage is critical in an ICD. This stage allows the researcher to reflect on what has been improved, what will be improved and what lessons have been learned. This stage needs to achieve three objectives. The first is to improve the Prototype OCAWSEM; the second is to draw the lessons from the results; and the third is to decide on the need for conducting the next case study.

3.4.4.1 Objective 1 – to improve the Prototype OCAWSEM

To improve the Prototype OCAWSEM is the first objective in the reflection stage. The Prototype OCAWSEM was assessed in terms of how it worked in the interviews and Web site evaluation process, and how it could be improved in the next case. However, the Prototype OCAWSEM could be also improved while conducting the current case, if the data collection and analysis processes could not be continued without this improvement. For example, if a new OCA is found from the interview, it will be added into OCA Repository used in the case. Then, the Web site evaluation will utilise this modified OCA Repository as a basis to assess whether this new OCA is supported by the Web site.

Specifically, the Prototype OCAWSEM can be broken down into several components including the Interview Guide (includes the interview questions and definition of OCAs), Interview Prioritising Principle, Web Site Evaluation Framework (includes the Web Prioritising Principles, Web Site Evaluation Forms, and OCA Repository), and Evaluation Process Instructions. This research identifies several crucial questions which should be answered in order to improve these components.

1. Questions relating to the interview questions: What questions help the interviewee nominate a list of OCAs, and then prioritise them? What proper terms should be incorporated in the questions?
2. Questions relating to the definition of OCAs: Can the definition of OCAs be understood by the interviewee? Does any modification need to be made to the definition?

3. Questions relating to the Interview Prioritising Principle: Are the Interview Prioritising Principles able to prioritise the OCAs nominated by the interviewees? Is there any proper Interview Prioritising Principle which should be added?
4. Questions relating to the Web Site Evaluation Framework: Is the Web Site Evaluation Framework capable of extracting a list of OCAs supported by the Web site? What changes should be made to the framework to enhance its usability? Are there any new OCAs divided, renamed or added into the OCA Repository? Are there OCAs that should be merged?

It is important to note here that the changes made to the OCA Repository came from two sources: the analysis of the data from interviews and the analysis of the Web site evaluation results.

3.4.4.2 Objective 2 – to draw lessons

To draw lessons is the second objective in the reflection stage. The questions posed in the preceding section can be useful to draw lessons. Takahashi and Imamiya's (2000) study found that evaluators can learn how to improve the Web design through the analysis of the Web sites. This means that improving the methodology and drawing lessons from the learning are not necessarily two separated activities but can be completed at the same time, because they are happening at the same time.

A clarification made here is that the answers for the questions posed in the preceding section are termed "lessons" while the improvements made to the OCAWSEM are term "improvements" in this thesis. Thus, the lessons include the answers for why some interview questions and terms are proper for eliciting OCAs, what kind of definition of OCAs can be better understood by the interviewees, how the lists of OCAs, which were nominated by the interviewees, can be prioritised and how the methodology can be improved.

In addition, the researcher needs to draw lessons from exploring widely on the questions posed in the preceding section, not just to focus on drawing lessons which are relevant to the components of the Prototype OCAWSEM. The researcher needs to draw lessons from understanding more about the notion of OCAs, to learn what types

of Web design can support the OCAs well, and to learn how to develop and improve another methodologies in other industries.

3.4.4.3 Objective 3 – to decide the concluding case

To decide the concluding case is the third objective, which is to decide whether conducting the next case study is required in the iterative process. In terms of deciding the concluding case, the researcher should assess both the learning and development aspects. Once no more major lessons have been learned and no more major improvements on the Prototype OCAWSEM have been found in the case, the iterative process can be stopped. Major lessons and major improvements discussed in this thesis refer to those research findings and changes made to the Prototype OCAWSEM that are critical to answer the research questions, to understand the notion of OCAs and to the development of the OCAWSEM. Assessing the end point of the case study process based on the ICD in this research should be conducted at the end of every case because each case can be considered as a complete iteration of the improvement of the Prototype OCAWSEM. One good illustration is found in Holsapple and Joshi's (2004) study. They assessed the results at the end of every iteration and made a decision about the need for the next iteration. This research also makes decisions on whether the next case should be conducted in the end of every case. The case study process stopped at the seventh case.

However, it has to differentiate the concepts of optimisation and improvement here. Ideally, the iterative process will never be stopped. As Westbrook (1994) noted, the real world operations often face unstructured problems, and it cannot be fully modelled. Thus, an ultimate methodology can never be developed, only one improved from the previous version. The desire to develop an ultimate evaluation methodology will result in an endless developing process. Practically, time and budget are crucial issues of any research project. Thus, when adopting the ICD, the researcher has to find a balance between achievement of the research tasks, and time and budget of the research project. It is acceptable to focus on developing an "exceptional" OCAWSEM rather than a "perfect" OCAWSEM.

3.4.5 Testing stage

The testing stage was conducted in the Testing Case Study only, not in the Developing Case Studies and was specifically in the last stage. The reason is that the Prototype OCAWSEM was under development in the Developing Case Studies. Thus, it is not well developed for testing. The purpose of this stage is to test the quality of the Developed OCAWSEM. To achieve this purpose, five relevant testing criteria have been chosen from the literature: validity, reliability, usability, extensibility, and adaptability.

The first two criteria are validity and reliability. Churchill (1979) argued that these two criteria are crucial to test the evaluation methodology which can be utilised to measure constructs. He defined a measure as valid when the difference in measured results reflects true differences on the characteristic that it is attempting to measure; and a measure is reliable when a number of independent measures made from the methodology can achieve a given object agreement. Thus, if the methodology is recognised as valid and reliable, it must be able to produce valid results repeatedly (Churchill, 1979; Zikmund, 1997).

The third is usability. This means how well the methodology performs its possible functions in terms of ease-of-use (Hix & Schulman, 1991; Hung & McQueen, 2004). It is important to note that a methodology should have ease-of-use, but not necessarily be quick-to-use. For example, a methodology is quick-to-use because it can be utilised by a repeat user (who utilised the methodology before) in a short time without spending any extra time for learning on how to utilise it. Yet, this does not guarantee that the user can utilise this methodology to perform evaluation tasks easily (the ability of ease-of-use). The fourth is extensibility. This criterion concerns whether the methodology is sensitive to rapidly occurring advances in the technologies which it tends to measure (Hix & Schulman, 1991). The fifth is adaptability. It examines whether the methodology is adaptable to the specific environment in which the methodology is used (Hix & Schulman, 1991).

The interpretive paradigm also has influenced how the Developed OCAWSEM is tested by these criteria. Different from the positivists, Johnson and Duberley (2000) suggested that interpretive researchers should be humble about their findings. Thus, the results produced from applying these criteria should be acceptable rather than absolute. In other words, this thesis believes that absolutely valid, reliable,

usable, extensible, and adaptable methodology is almost impossible to develop. The Developed OCAWSEM is expected to be an evaluation methodology with acceptable validity, reliability, usability, extensibility, and adaptability.

3.5 Results Presentation

Yin (2003) suggested that how the case results will be composed and presented should be identified in the design stage of the case study. For this thesis, three chapters will be utilised to present the results of case results: Chapter 4 (Results Part I), Chapter 5 (Results Part II) and Chapter 6 (Results Part III). As discussed earlier in this chapter, the Prototype OCAWSEM has been modified and evolved iteratively through the Developing Case Studies, and then finally tested in the Testing Case. The results of how this methodology has been evolved and the improvements made to it will be presented in Chapter 4 which is the Developing the Prototype OCAWSEM Chapter. Then, the results of the final test on the methodology will be discussed in Chapter 5 which is the Testing the Developed OCAWSEM Chapter. Previously, this chapter also pointed out that the results derived from each of the Developing Case Studies include two aspects – the improved Prototype OCAWSEM and the knowledge gained. While the improvements have been made to the methodology will be presented in Chapter 4, the knowledge gained will be presented in Chapter 6 which is the Lessons Learned Chapter.

This thesis will present the results based on the concepts, issues, explanatory topics, and lessons across all the cases. Yin (2003) suggested that this presentation style is one of the effective alternatives employed in multiple-case studies. Each section or chapter in the case results is dedicated to a concept, issue or explanation. The information from the individual cases is discussed throughout sections or chapters. This style gives readers an opportunity to compare the results discussing the same topic across the cases, and they consequently see a full picture on "each individual topic". However, in this thesis, the readers also lose an opportunity to see the full picture on "how the OCAWSEM was being evolved gradually". In other words, the reader can see the end, but not the means. In contrast to this style, presenting the improvement through a case-by-case basis will give readers a "full

picture" on how the OCAWSEM was being evolved, but it would be difficult for readers to compare the results discussing the same topics across the cases.

A solution suggested by Yin (2003) is that of preparing summary information on the individual cases in an abbreviated vignettes. This suggestion has been applied to the presentation of Chapter 4 which is the Methodology Development Chapter since this chapter presents the improvements made from the multiple cases. A summary of these improvements made in the cases gives readers a more complete picture enabling them to realise how the methodology was being evolved. Thus, this chapter will first summarise what results are gathered in individual cases in order to show readers a complete picture of the case studies, and then present the comparisons of results in regard to specific issues in the second. No summary on cases will be made in Chapters 5 and 6 which are the Methodology Testing Chapter and the Lessons Learned Chapter respectively. It is because Chapter 5, which is the Methodology Testing Chapter, concerns the results from only single case – the Testing Case Study, and Chapter 6, which is the Lessons Learned, concerns the lessons learned from all the cases rather than each of the individual cases.

3.6 Justification on the Research Design

This section will justify the quality of the research design discussed in this chapter. This research is a multiple-case study and falls into the interpretive paradigm. This type of case study is termed "interpretive case study" (Klein & Myers, 1999; Myers, 1994; Orlikowski & Baroudi, 1991; Walsham, 1993). As most mainstream IS journals now welcome interpretive case studies, an important question which has been raised is how the quality of this type of research can be assessed (Klein & Myers, 1999). Davidson (2002) also revealed that it is incumbent on the researcher to clarify those criteria which should be adopted to judge the interpretive case project. Thus, this section will assess the quality of the research design discussed previously in this chapter.

To justify the quality properly, this thesis has followed a process. Firstly, it justifies how the critical philosophical assumptions in which this research is grounded influence the research design discussed previously in this chapter. Secondly, it chooses the proper criteria which can be used to assess the quality of the research

design. Thirdly, it also presents the principles which can be used to assess the quality of the research design and the assessment results produced based on these principles and the proper criteria.

3.6.1 Critical philosophical assumptions

The critical philosophical assumptions in which this research is grounded influence the design of this research. These are four assumptions, "philosophical assumptions", which are derived from the research paradigms, and their influence on the design of the research is discussed in the following paragraphs.

Firstly, the interpretive paradigm assumes that the meaning of human organisations is based on subjective meaning and interpretation. Thus, the design of this research was based on that understanding phenomenon and exploring knowledge come from the process of interpretation through the interpretive researcher's interaction with the world around them.

Secondly, this research accepts Boland's (1985) argument that a phenomenological study cannot claim to have a proof of its findings. The findings of this type of study are assessed according to a reliance on its method and the hope that others will "see" its descriptions as true and accurate. This assumption confirms that the findings of Web site evaluations are not the focus of this research. Instead, the focus is on the OCAWSEM. Furthermore, Boland's (1985) argument also confirms that this research focuses on how to elicit OCAs from the management. This is concerned more with the "method" of generating a list of OCAs from various interviewees than the "results" of the interviews. Moreover, this assumption also shows that the presenting of proper and relevant evidence to persuade readers to believe the lessons learned from the hermeneutical analysis of both constructs is critical to enhancement of the quality of this research.

Thirdly, the hermeneutic phenomenology does not ask the researcher to bracket the biases and assumptions in the process of self-reflection as discussed previously in Section 3.2. Therefore, the final document derived from a hermeneutic phenomenological study is allowed to include personal assumptions of the researcher and philosophical bases from the interpretations. This implies that the rigour is not claimed by repeating the research by other researchers, but by presenting the research to allow others to flow logically from the beginning to the end. As Laverty (2003)

suggested, it is critical for a hermeneutic phenomenological study to provide the multiple stages of interpretation that allow patterns to emerge, the discussion of how interpretations arise from the data and the interpretive process itself. Thus, this chapter provides a thorough discussion on the stages of interpretation, how interpretations arise from the data and the interpretive process.

Fourthly, this research is based on the approach of individual action learning. The outputs of this research are produced from the researcher exclusively after engaging in the research context through the phases of experience, reflection and generalisation, and testing. Since this is an individual learning approach, any involvement from others in the learning process is not sought.

3.6.2 Assessment criteria

Selecting proper assessment criteria for assessing the quality of the research design in this research needs more considerations than in a positive case study. Currently, the criteria for assessing positive case studies are prevailing (e.g. Benbasat et al., 1987; Dube & Pare, 2003; Eisenhardt, 1989; Rowley, 2002; Yin, 2003). These positive case researchers made a number of suggestions to enhance the validity and reliability of positive case studies.

However, more interpretive case studies have been carried out and are being accepted by the premium IS journals, such as the studies of Orlikowski and Baroudi (1991), Klein and Myers (1999), and Davidson (2002). Interpretive case researchers start to question whether these suggestions on the validity and reliability are applicable to interpretive case studies. For example, Doolin (1994) believed that the validity of the interpretive case study relies on the plausibility of the logical reasoning used in describing the results and in drawing conclusions from them. Laverty (2003) found that the issues of reliability and validity of interpretive case studies can be addressed through the examination of rigour, trustworthiness, credibility, and authenticity. These discussions show that the criteria utilised to assess the quality of interpretive case studies seem to be different from the ones utilised to assess positive case studies. Moreover, the criteria available in the literature are inconsistent and confusing. It needs more consideration when assessing the quality of the design of this research as it is an interpretive case study based on the ICD.

This research adopts the terms "rigour" and "relevance" to replace the assessment criteria of reliability and validity. One major reason is that these terms are favoured in the interpretive research while the terms reliability and validity are seen more often in the positive research. Nevertheless, these two terms are adopted commonly to assess case study research (e.g. Benbasat & Zmud, 1999; Dube & Pare, 2003; Klein & Myers, 1999). Grounded on the prior studies (Benbasat & Zmud, 1999; Dube & Pare, 2003; Klein & Myers, 1999), the definition of rigour in this research is that the research provides well-documented research procedures and supportive evidence, while allowing other researchers to read and check them, and hopefully, to arrive at the same conclusions. The definition of relevance is that the research satisfies the interests of intended readers after their reading.

When dividing a research project into research process and outcomes, the rigorousness and relevance belong to the well-known research evaluation approaches – formative and summative respectively. Formative evaluations are interested in fostering the development of a research investigation while summative evaluations focus on assessing the effects or effectiveness of a research investigation (Druckman, 2005). In other words, formative evaluations focus on the evaluation of process whereas summative evaluations focus on the evaluation of outcomes. However, this research does not give any specific weight to rigour or relevance despite some studies having called for an emphasis on one more than the other (e.g. Benbasat & Zmud, 1999; Dube & Pare, 2003).

3.6.3 Selected assessment principles and the assessment results

In addition to the assessment criteria rigour and relevance, this research also accepts what Benbasat et al. (1987) have suggested that case study is not a storytelling or an opinion piece, and it should adhere to certain rules of procedure. When these rules are established, they will complement the criterion relevance by increasing the trustingness of the readers of the research, and then the satisfaction of the readers is enhanced. This section will discuss what principles have been chosen to assess the quality of the research design in this research. Then, the subsections of this section (Section 3.6.3.1 to 3.6.3.10) will present the assessment results based on applying these principles.

Klein and Myers (1999) proposed seven assessment principles to conduct interpretive field studies in IS; the principle of the hermeneutics circle, the principle of contextualisation, the principle of interaction between the researchers and the subjects, the principle of abstraction and generalisation, the principle of dialogical reasoning, multiple interpretations, and the principle of suspicion. They argued that these principles are consistent with a considerable part of the philosophical substance of the literature on interpretive paradigm. In their studies, they used these principles to assess three prior interpretive case studies. The results show that these principles are able to assess the quality of these studies and provide useful recommendations to improve their research designs. Davidson (2002) also applied these principles to justify the quality of her interpretive field study based on how the study fulfils the requirements from these principles. She recommended that these principles are "recognised principles" for conducting the interpretive research.

This research adopts the seven principles suggested by Klein and Myers (1999), but adapts the principle of abstraction and generalisation into the principle of relevance. The reasons for this modification will be given while discussing the results made by applying this principle in Section 3.6.3.6. In addition to these seven principles, this research also adopts two other principles which have been suggested by case researchers for assuring the quality of any case studies for decades (e.g. Benbasat et al., 1987; Debu & Pare, 2003; Yin, 2003). They are the principle of proper data collection methods and the principle of proper data collection techniques. Moreover, this research also proposes another principle – the principle of creating in-depth knowledge. This is based on the calls made from the literature (Hirschheim & Klein, 2003; Walsham, 1995; Zinatelli & Cavaye, 1993) arguing that generating in-depth knowledge is a critical contribution to explorative IS research. In total, there are ten principles selected to assess the quality of this research. These principles are shown in Table 3.4 (see next page).

Table 3.4 also shows which areas the principles should be applied to. As Dube and Pare (2003) recommended, the assessment on case studies should be considered in four areas: data collection, data analysis, research results, and overall research design. Thus, the principles are categorised according to these four areas in Table 3.4. In each area of this research, the selected principles are utilised to assess whether the area is rigorous or/and relevant.

Table 3.4 *Selected assessment principles*

Research Areas	Assessment Principles
Data Collection	The principle of proper data collection methods The principle of proper data collection techniques The principle of multiple interpretations
Data Analysis	The principle of interaction between the researchers and the subjects The principle of the hermeneutics circle
Results	The principle of relevance The principle of creating in-depth knowledge The principle of contextualisation
Overall Research Design	The principle of dialogical reasoning The principle of suspicion

However, the judgement on the quality of the "Results" area mentioned in Table 3.4 is based on the "means" to achieve the results. In other words, the judgement is based on what "design considerations" made previously in this chapter will contribute to produce satisfactory results that are required by the principle of relevance, the principle of creating in-depth knowledge, and the principle of contextualisation.

3.6.3.1 Principle of proper data collection methods

The first principle is to employ proper data collection methods in the data collection. In terms of data collection from Web sites, this research has discussed the research objectives and tasks, and then justified why the manual Web site evaluation is selected, the difficulties which will be faced and how these difficulties can be overcome. In terms of data collection on OCAs, this research has justified why the semi-structured interview is chosen. In addition, many researchers appreciate its ability to pre-test the ambiguous questions (Powell, 1992; Sledgianowski & Luftman, 2001), and to best access the important data sources for interpretive research (Walsham, 1995).

A justification should be made here. The observation method is not proper for this research, although it is one of the most direct ways of obtaining data (Gillham, 2000). The reason is that this research tends to identify what OCAs the management believes that they are conducting in the cases rather than observing what OCAs they are actually conducting. In addition, Gillham (2000) notes that one has to consider carefully the time to commit in observation, the difficulties in collating and analysing data, and writing it up adequately. After all, observing people is slower than asking

them about what they do. Thus, this research does not use observation as the data collection method.

Because the proper data collection methods were employed in interviews and Web site evaluation, the design of this research has fulfilled the principle of proper data collection methods.

3.6.3.2 Principle of proper data collection techniques

The second principle is to employ proper data collection techniques in the data collection. This research employs four kinds of proper data collection techniques which are discussed below.

The first kind of proper technique includes the Prototype OCAWSEM and the Developed OCAWSEM. They serve as a case study protocol to data collection. Benbasat, Goldstein, and Mead (1987) suggested that case study protocol, which includes certain rules of procedure, can avoid the case study becoming a storytelling exercise. Yin (2003) also argued that utilising case study protocol can overcome a problem in the data collection of case study. This problem is that the investigator may slowly begin to drift away from the original topic of interest as the iterative process progresses in order to build explanations in the multiple-case studies. Thus, the Prototype OCAWSEM and Developed OCAWSEM are essential to the multiple-case studies in this research.

However, the Prototype OCAWSEM used in the cases is a specific case study protocol. It is because this research is not concerned with comparing the evaluation results between the cases. Rather, it focuses on developing an OCAWSEM and learning through the OCAWSEM Developing Process. This process can be seen as an iterative developing process. The Prototype OCAWSEM is the input whereas the Developed OCAWSEM is the final product in this process. The Prototype OCAWSEM is improved during the case study process. Thus, it is not a static protocol, but a dynamic one. The Prototype OCAWSEM, which was under development, can be called a “dynamic case study protocol” from this perspective. It is improved and modified through the case study process, and will become a better protocol from the previous case. Thus, the Prototype OCAWSEM used in the cases is a specific case study protocol.

The second kind of proper technique includes the Web Site Evaluation Forms which can help evaluate the Web site, and then prioritise the OCAs supported by the Web site. As Hung and McQueen (2004) suggested, utilising the Web Site Evaluation Forms can provide a systematic way to evaluate Web sites. Thus, the four Web Site Evaluation Forms included in the Prototype OCAWSEM are proper techniques.

The third kind of proper technique is the interview recording. Walsham (1995) suggested that recording interviews is critical in the interpretive research. The reason is that recording interviews allows checking of the errors in the text during the transcribing process. This research adopts this proper technique by utilising a high-quality digital recorder to record all interviews.

The fourth kind of proper technique is the reflective journal. The purpose of a reflective journal is to reflect on the analysis of the text which is transcribed. Laverty (2003) suggested that the use of a reflective journal is one way in which a hermeneutic circle can be engaged, moving back and forth between the parts and the whole of the text. This research utilised this proper technique when analysing the interview data.

Because these proper techniques were adopted, the design of this research has fulfilled the principle of proper data collection techniques.

3.6.3.3 Principle of multiple interpretations

The third principle is the principle of multiple interpretations. According to Klein and Myers (1999), this principle requires sensitivity to possible differences in interpretations among the participants. They argued that this is similar to drawing a complete picture from multiple witnesses even if all tell it as they saw it. The researcher should deal with the contradictions potentially inherent in the multiple viewpoints, and revise his or her understanding accordingly.

This research fulfils this principle by capturing various viewpoints through the interviews with different levels of members in regard to what OCAs they believed the university is conducting. These levels of members include senior team, marketing team and Web team. Because various viewpoints have been captured, the design of this research has fulfilled the requirement of the principle of multiple interpretations.

3.6.3.4 Principle of interaction between the researchers and the subjects

The fourth principle is the revealing of the interaction between the researchers and the subjects. As Klein and Myers (1999) suggested, this principle requires the researcher to critically reflect on their research methodology. In that, the researcher should show how the research materials (or data) were socially constructed through the interaction between the researchers and participants, and also how the researchers' interpretations emerged as their understanding of the case improved.

This research has complied with this principle by having extensive discussions in this chapter of why several research methodologies are not appropriate, how the ICD is proper to this research and the principles to apply to it, followed by a detailed research framework. Through these discussions, how the researcher interacts with the subjects during the data collection, data analysis, and the reflection between cases are revealed clearly. Because these thorough discussions have been made, the design of this research has fulfilled the requirement of the principle of interaction between the researchers and the subjects.

3.6.3.5 Principle of the hermeneutic circle

The fifth principle is the principle of the hermeneutic circle. According to Klein and Myers (1999), all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. Therefore, this circle shows how we come to understand a complex whole from preconceptions about the meanings of its parts and their interrelationships.

To deal with this principle, this research provides how the interpretation and understanding of the parts is interrelated with the whole picture of this research in Figure 3.1 shown in Section 3.1.2. This figure shows three research tasks and outcomes in this research, and the relationships between them. This figure also shows how the iteration between the process (includes the three research tasks) and outcome (includes the three research outcomes) domain can happen. Thus, this figure reveals how the results from the part are understood and interrelated with the whole picture of this research.

In addition, this research also utilises the computer software – NVivo – and thematic coding to help the researcher to create an understanding between the parts of research data and the whole picture of this research. Therefore, the researcher can

interpret the parts of text efficiently rather than build and examine the interrelationships between these detailed concepts from the text. Because the figure and tools were utilised, the design of this research has fulfilled the requirement of the principle of the hermeneutic circle.

However, this principle also leads to consideration of a common issue which occurs in the hermeneutic studies, that is, whether multiple coders should be employed. This research will employ single coders in each case. The reasons are as follows.

Firstly, this research adopts the suggestion given by the interpretivist that employing more coders is unnecessary. For example, Carley (1994) suggested the requirement of more coders is unnecessary because the totally meaning of the text cannot be fully understood and the coding requires the coder to make subjective and impressionistic judgments. Hodder (1994) sees text as the artefact produced under certain material conditions. Therefore, it is accessed in a way that not everyone else can has access to. Davidson (2002) also confirmed that the interpretive research reflects the researcher's interest in socio-cognitive processes and his or her sense-making during the course of the research. Thus, the understanding of the text is subject to personal interpretive analysis.

However, there is a debate of whether more coders are needed for the coding process in qualitative research. The other side, the positivist, believes that objectivity is critical in qualitative research, therefore, more coders are necessary (e.g. Kvale, 1996). Because this research is interpretive research, thus the requirement of more coders is unnecessary.

Secondly, it is not proper to have other coders in this research from a practical perspective. Since the notion of OCAs is new, the coder other than the researcher would have very less understanding of it, and the interviewees. Thus, involving other coders in the coding process will be more likely to be misleading in the exploration of the notion of OCAs, and result in inaccurate coding.

Thirdly, from a hermeneutics phenomenologist perspective, employing the researcher as the only coder is possible. Since the hermeneutics phenomenologist does not bracket the biases and assumptions in the process of self-reflection (Laverty, 2003), it is unnecessary to employ more coders to tentatively discover the personal biases and assumptions in the coding results of the researcher.

Based on these reasons, this research employs single coders in each case. Furthermore, the researcher should be the only coder. This is because this research is based on the individual aspect of action learning (McGill & Beaty, 1995). The individual aspect of learning and reflection from the text should be considered as the researcher's subjective learning. Thus, the researcher should be the coder in the study of the text derived from the interviews and the evaluator in the review of the text appeared on the Web site. For these reasons, this research employs the researcher as the coder and evaluator.

3.6.3.6 Principle of relevance

The sixth principle is the principle of relevance. This is not included in the set of principles of Klein and Myers (1999). They suggested another principle to assess the research results, which is the principle of abstraction and generalisation. Since this research is based on the action learning and hermeneutic phenomenology paradigm, the results, which are the knowledge and the OCAWSEM, are contingently based. Thus, the generalisation is not a concern in this research. However, it does not mean that they are not generalisable. Instead, for any one who wants to claim the generalisation of the results of this research should further examine the results on other occasions.

This research adopts other researchers' (e.g. Benbasat & Zmud, 1999; Hirschheim & Klein, 2003; McBride & Fidler, 2003; Walsham, 1993) suggestions to employ the principle of relevance to assess the research results. Based on the purposes of this research, the relevance of results includes three aspects: practical orientation, organisational orientation, and interesting.

In terms of practical orientation, Benbasat and Zmud (1999) argued that the results of the IS research should be relevant by providing useful knowledge which can be adopted by other practitioners. Hirschheim and Klein (2003) commented on a shift of the relevancy of research from a more academic focus on the internal stakeholders to a more practical focus on the external stakeholders. Although the results of this research are not yet presented, the research design does show that the outcome will generate useful and practical knowledge for practitioners to be able to identify their OCAs and evaluate their Web sites.

In terms of organisational orientation, McBride and Fidler (2003) argued that the results of IS evaluation should yield benefits to the host organisation. Since this research will provide the Developed OCAWSEM, which is a valid and reliable evaluation methodology, through a series of case studies, thus this methodology is applicable to all of the field cases. This will provide valuable benefits to the case organisations, such as knowing what OCAs are not supported well by the Web site, and how to improve the Web site.

In terms of interesting, Benbasat and Zmud (1999) argued that one dimension of relevance is interesting. Walsham (1993) also argued that there are no correct and incorrect theories but there are interesting and less interesting ways to view the world in the interpretive tradition. Because the notion of OCAs and how to measure the Web sites supporting these activities can be interesting to both academics and practitioners, it is argued here that the results of this research will be interesting.

3.6.3.7 Principle of creating in-depth knowledge

The seventh principle is the principle of creating new knowledge. Zinatelli and Cavaye (1993) argued that generating in-depth knowledge is a critical contribution for the case study. Hirschheim and Klein (2003) also believed that IS research should be assessed by the amount of new insight added. Walsham (1995) even argued that the contribution of rich insight is a type of generalisation. Since this research will generate a profound knowledge through an iterative learning process involving the Developing Case Studies, the knowledge produced will be in-depth knowledge contributing to the study areas.

However, one may argue that the iteration learning process in this research is like a testing process. The Prototype OCAWSEM will not be mature in the earlier cases. Will the knowledge produced from the immature methodology still be valuable? This research accepts Bird's (1998) claim that one can use a method to obtain knowledge without also knowing that the method is totally reliable. The major reason is that if someone who insists no mistakes can be made when trying to look at things and has unreliable eyesight, then he or she can never see things. It is because no one can ever have totally reliable eyesight. Therefore, a methodology can be used to gain knowledge, even if the methodology might in a small proportion of cases go wrong (Bird, 1998). The knowledge produced is still valuable as long as it is, as required in

the sixth assessment principle, the relevance result which has the practical orientation, organisational orientation and interesting results.

3.6.3.8 Principle of contextualisation

The eighth principle is the principle of contextualisation. This principle concerns that inevitable difference in understanding between the interpreter and the author of the text since there is a historical distance between them (Klein & Myers, 1999). Thus, Klein and Myers (1999) suggested that interpretive researchers should reflect on the social and historical background of the research setting. Hopefully, the readers can see how the current situation under investigation has been emerged.

To comply with this principle, this research provides an extensive discussion on the setting of this research. A series of discussions on the background of the eight cases are provided in Appendix 3 for reader to understand the contexts of the eight cases. Moreover, the quotes of the interview transcripts and the screenshots of sub-sites will be supplied in order to lead the reader back to the historical settings of the contexts.

3.6.3.9 Principle of dialogical reasoning

The ninth principle is the principle of dialogical reasoning. As suggested by Klein and Myers (1999), this requires the researcher be sensitive to possible contradictions between the theoretical preconceptions guiding the research design and actual findings with subsequent cycles of revision. They also suggested that researchers should identify research paradigms, and be aware of the strengths and weaknesses of the preferred research paradigms to the purpose of the work.

This research fulfils this principle by extensively discussing the research paradigms of this research and how the assumptions from these paradigms influence the design of this research in this chapter. Then, the dialogical reasoning will be employed to confront the contradictions between the pre-conceptual knowledge derived from the literature and merged knowledge from the case studies.

3.6.3.10 Principle of suspicion

The tenth principle, the final one, is the principle of suspicion which requires the researcher to be sensitive to possible biases and systematic distortions in the

narratives collected from the participants (Klein & Myers, 1999). This research is cautious on this principle by stating the research paradigms of this research in order to let the reader understand the possible biases and distortions that may be raised from the results of this research. These suspicions will be addressed explicitly in Chapter 7, the Conclusion.

In conclusion of Section 3.6, the design of the research framework has high quality in the areas of data collection, data analysis, results, and overall research design. The design of this research has complied with the standards required for a quality interpretive case study.

Yet, previous assessment discussions do not attempt to overreach the limitations of the research framework. There are still some limitations on the interview method, Web site evaluation method, and the research design utilised in this research. These limitations will be addressed explicitly in the final chapter – Chapter 7.

3.7 Chapter Summary

This chapter discussed the design of this research. Section 3.1 has shown a grand plan which has been adopted to conduct the empirical research to generate answers to the four research questions. The plan included proposing a Prototype OCAWSEM and an OCAWSEM Development Process to further develop and improve the prototype into a Developed OCAWSEM, and then finally test the Developed OCAWSEM. Section 3.2 showed that this research has adopted three research paradigms to develop the Prototype OCAWSEM: interpretive paradigm, hermeneutic phenomenology, and action learning. Section 3.3 discussed the research methodology of this research, which was the case study methodology based on the ICD. Section 3.4 presented a research framework which has been created to develop the Prototype OCAWSEM and finally test the Developed OCAWSEM. Section 3.5 explained how the results would be presented in the next three chapters. Finally, Section 3.6 justified the research design of this research, based on the discussions of how the critical philosophical assumptions this research is grounded on influenced the design of this research, how the design of this research deals with the assessment criteria, rigour and

relevance, and how the design of this research fulfilled the requirements of ten assessment principles.

CHAPTER 4

RESULTS PART I:

DEVELOPING THE PROTOTYPE OCAWSEM

This chapter is the first chapter presenting the results made from conducting the Developing Case Studies. These case studies were used to develop the Prototype OCAWSEM. In each case, the methodology has been utilised to measure the support practices and has been improved. There were three types of outcomes produced from the case studies – the support results, the improved Prototype OCAWSEM, and knowledge (lessons). This chapter will present how the Prototype OCAWSEM was improved in these case studies and discuss these improvements. The knowledge

produced in these cases will not be presented here, but in Chapter 6. As discussed in Chapter 3, this thesis will not present the support results produced in the Developing Case Studies.

The presentation of this chapter is organised into seven main sections, categorised into three parts. The first part includes Section 4.1. which presents the improvements made to the Prototype OCAWSEM in each of the Developing Case Studies. How the Prototype OCAWSEM was improved in each of the Developing Case Studies will be presented sequentially. The second part comprises the five sections from Section 4.2 to 4.6. Rather than presenting the improvements on a case-by-case basis, these sections present the improvements made to the Prototype OCAWSEM on a component basis. The improvements made to each of the major components of the Prototype OCAWSEM will be discussed. These major components include the Interview Guide, OCA Repository, Web Site Evaluation Forms, Interview Prioritising Principles, Web Prioritising Principles, and Evaluation Process Instructions of the Prototype OCAWSEM. The third part is Section 4.7, a summary of this chapter.

4.1 Improvements made in the Developing Case Studies

This section will present the improvements made to the Prototype OCAWSEM in each of the Developing Case Studies. The improvement mentioned here is defined as:

> *The decision made on adding any new component, deleting any component, or modifying any part of the Prototype OCAWSEM in order to improve its usage and functionality for the evaluation of the support made to OCAs from Web sites.*

This section will also highlight, describe, and discuss the reasons for making the improvements. More thorough and detailed discussions on the improvements made on the components of the Prototype OCAWSEM can be sought in Section 4.2 to 4.6.

4.1.1 Improvements made in the first case study

The improvements made in the first case study are summarised in Table 4.1 (see next page). In comparison with the latter case studies, many improvements have been made to the components of the Prototype OCAWSEM in this case study. This is not a surprising result in the early stage of the OCAWSEM Developing Process. In particular, more improvements have been made to the interview questions, the OCA Repository, and Web Site Evaluation Forms.

Table 4.1 *Improvements made in Case Study 1*

	DF	Questions	OCA Rep	Forms	Instructions	Total
Case 1	0	5	7	10	11	33

In total, five improvements have been made to the questions in the Interview Guide. These improvements include asking the interviewees to identify a list of important things, top priorities, and things concentrated on in the university; posing the definition of OCAs to them again and asking them to identify a list of OCAs repeatedly; asking them to describe how this university defines its success; asking them to describe how this university competes with others based on the strategic situation of the university; and abandoning one question which was used to ask the interviewee to nominate a list of critical projects. These improvements were made to deal with a major problem occurring during the interviews, which was the difficulties for the interviewees to nominate a list of OCAs.

Seven of the improvements made to OCA Repository include adding two new OCAs, renaming two OCAs, merging OCAs, dividing one OCA into two and arranging the list of OCAs into an alphabetical order. Details of these improvements are described in Table 4.2 (see next page).

Interestingly, those newly added and renamed OCAs were obtained according to the results of the Web site evaluations rather than the interviews. In other words, the interviewees did not recognise any particular OCA this university should be conducting other than the activities listed in the OCA Repository. However, some interviewees did comment that the "recruiting students" activity should have two aspects – international and domestic. Thus, the "recruiting students" activity has been

divided into the "recruiting domestic students" and "recruiting international students" activities.

Table 4.2 *Details of improvement made on OCA Repository in Case Study 1*

Improvements in OCA Repository	Details
Adding New OCAs	The two new OCAs are "enhancing internal administrative efficiency" and "maintaining relationships with previous students".
Renaming OCAs	"Imaging, branding, and reputation" is renamed "increasing the branding"; "training staff" is renamed "developing staff".
Merging OCAs	"Sustaining research income" and "conducting research" are renamed "developing research".
Dividing OCA	"Recruiting students" has been divided into "recruiting domestic students" and "recruiting international students".
Arranging into Alphabetical Order	The OCAs listed in the OCA Repository have been arranged into alphabetical order.

There are four Web Site Evaluation Forms contained in the Prototype OCAWSEM. All of these were improved during the first case study. The most improvements are adding instructions into these forms in order to deal with the difficulties of deciding the scope of evaluation and recording the results. These instructions are summarised in Table 4.3.

Table 4.3 *Instructions made on the Web Site Evaluation Forms in Case Study 1*

Difficulties	Instructions (Where was the improvement made?)
Evaluation Scope	• Departmental sub-sites will not be evaluated unless they support any university level activity (Web Site Evaluation Form 1). • This research counts only those sub-sites which support the OCA directly (Web Site Evaluation Form 2).
Results Recording	• Delete repeated sub-sites in the same net domain, but keep the one with the shortest path (Web Site Evaluation Form 2). • The column Title of the Sub-site has been replaced as Title of the Sub-site and How It Was Found (Web Site Evaluation Form 2). • If a sub-site contains lower level of sub-sites, which support the same sub-activity enabling the OCA, these lower levels of sub-sites are not recorded in the Web Site Evaluation Form 2 (Web Site Evaluation Form 2). • The evaluator is asked to record the activities in each level of categories alphabetically (Web Site Evaluation Form 4). • One instruction has been added to define the meaning of the term "search function" (Web Site Evaluation Form 3B).

As shown in Table 4.3, seven improvements were made to the Prototype OCAWSEM totally in regard to the two difficulties. The most significant reasons for these two

difficulties were that the evaluator was unable to identify those "valid" Web pages from hundreds of sub-sites contained in a university Web site, evaluate and judge them, and record the evaluation results into the Web Site Evaluation Forms correctly. These instructions assisted the evaluator in performing the evaluation process more easily by understanding which sub-sites need evaluation and in what way the results should be recorded on an efficient basis and in an effective format for further interpretation.

The other three improvements were made for the purpose of evaluating how the Web site supports the "branding" activity. Web Site Evaluation Form 3 was divided into two forms – Web Site Evaluation Form 3A and 3B. Web Site Evaluation Form 3B was designed specifically for evaluating how well the Web site was supporting university branding. In addition, adding instructions of evaluation of branding in a new form would reduce confusion and save time to search proper information from the forms during the evaluation process.

Two major difficulties were found during the analysis of interview results. Firstly, there was a mismatch between the activities nominated by interviewees and whether these nominated activities are the OCAs defined by this research. For example, they may nominate some activities as OCAs; however, these activities are not the OCAs defined by this research. It is important to discern these inappropriate answers. To deal with this difficulty, four principles were added into the instructions of the Prototype OCAWSEM. These principles are the basis for normalising the nominated OCAs into the terms desired by this research. These principles are termed "Interview Normalisation Principles" in this research. The actions for normalisation included in these principles are:

- Confirming the OCAs, which were nominated by the interviewees, with the definition of OCAs and the OCA Repository;
- Deleting any non-OCAs;
- Adding any new OCA into OCA Repository; and
- Dividing an OCA into two or more OCAs.

Secondly, there was a difficulty in prioritising a number of OCAs which were nominated by the interviewees. The Prototype OCAWSEM only contained one Interview Prioritising Principle, that is, "the activity as nominated by more

interviewee is more critical". Since the interviewees had diversified views on what OCAs were being conducted by the university and the priority on these activities, it was insufficient to prioritise these diversified results based on merely this principle. To overcome this weakness, five extra Interview Prioritising Principles were added into the Prototype OCAWSEM. They are shown in Table 4.4 (see next page).

Table 4.4 *Interview Prioritising Principles added in Case Study 1*

No	Added Interview Prioritising Principles
1	The activity as nominated by the interviewee who is the senior management member is more critical.
2	The activity which contributes to the success of university level is more critical than the functional level activity mentioned by the interviewee who is responsible for it.
3	The activity nominated explicitly is more critical than the one nominated implicitly.
4	The activity prioritised higher by the interviewees is more critical.
5	The activity which provides more contribution to university's success is more critical.

It is important to pay attention to the third principle in Table 4.4. Activities can be nominated by the interview explicitly or implicitly. The activity which is nominated by interviewees explicitly after they were given the definition of OCAs is termed "Explicit OCA" in this thesis. The activity which is not nominated by interviewees explicitly after they were given the definition of OCAs, but in other parts of the interview implicitly regarded as critical to attain the success of the university is termed "Implicit OCA" in this thesis. Section 4.2.2 will discuss more detail about these two kinds of OCAs.

In addition, there is a sequence of applying these Interview Prioritising Principles. They must be applied sequentially according to their numbers. Further justification on how these principles can be applied and why they are valid will be presented later in this chapter. In addition, these principles were introduced initiatively and tentatively in the first case study. They were helpful in prioritising the OCAs which were nominated by the interviewees in the first case study. Yet, whether they were to be applicable in other case studies was still unknown at this point.

4.1.2 Improvements made in the second case study

The improvements made in the second case study are summarised in Table 4.5 (see next page). In terms of quantity, most improvements were made in this case study. This is also not a surprising result because the Prototype OCAWSEM utilised in this case study was still immature, still needing a number of improvements to be made.

Table 4.5 *Improvements made in Case Study 2*

	DF	Questions	OCA Rep	Forms	Instructions	Principles	Total
Case 2	0	1	4	3	18	12	38

Table 4.5 shows one extra column – the Principles column, has been added in comparison with Table 4.1 – the results table presented in the first case study. The Principles column denotes the improvements made to the Interview Prioritising Principle, Interview Normalisation Principle and Web Prioritising Principle. These principles are designed for providing the analysis on the interview results and Web site evaluation results in a systematic and reliable manner.

Table 4.5 also shows the most improvements made to the instructions. There are eighteen improvements made on the instructions. No further improvements will be made to the instructions in the later case studies. Fifteen are about separating the principles and modifying the instructions of utilising various kinds of principles for the purpose of ease of reading that includes separating the principles from the instructions and stating how they can be operated. One of the more significant improvements made are three instructions which were added for instructing the Web evaluator to start the evaluation from centre of the Homepage; to start the evaluation from the top of the sub-site to the side and to the bottom; and to identify what OCAs the sub-site is supporting based on the purpose of the sub-site and the purpose of the link referring to the sub-site.

The second most improvements made on the components in this case study is on the various kinds of "principles". Firstly, there are six new principles which have been added into the Prototype OCAWSEM in order to provide help in producing a final list of OCAs from the interview results. These new principles are termed "Interview Scoring Principles" in this thesis. These Interview Scoring Principles are shown in Table 4.6 (see next page).

These principles are employed to quantify how critical each of the nominated OCAs is before utilising the Interview Prioritising Principles to prioritise the nominated OCAs. This provides help for judging the final priority on the nominated OCAs.

Table 4.6 *Interview Scoring Principles added in Case Study 2*

No	New Interview Scoring Principles	Scores
1	The activity contributes to the success of university level and is revealed by one interviewee explicitly.	20
2	The activity contributes to the success of university level and is revealed by one interviewee implicitly.	15
3	The activity contributes to the functional level success and is revealed by one interviewee explicitly.	15
4	The activity contributes to the functional level success and is revealed by one interviewee implicitly.	10
5	The activity supports part of OCA and is revealed explicitly.	10
6	The activity supports part of OCA and is revealed implicitly.	5

Secondly, two Interview Normalisation Principles and one Web Prioritising Principle were added into the Prototype OCAWSEM. The two Interview Normalisation Principles require an "F" to be noted beside the activity which is considered as a functional critical activity and a "P" beside the one which is considered as part of an OCA. Practically, the analyser who analyses the interview results needs to normalise the nominated OCAs before scoring them. Noting these two letters makes scoring the nominated OCAs become more efficient. In regard to the one new Web Prioritising Principle, it was used to overcome a difficulty. Sometimes, some activities are supported by, for example, only two sub-sites. Suppose these two sub-sites are all ranked in the same levels of informativeness and interactivity by utilising Web Site Evaluation Form 3B (the form showing the evaluation criteria). If this is the case, it is difficult to prioritise these OCAs. The newly added Web Prioritising Principle overcomes this difficulty by examining the numbers of sophisticated Web features supporting the OCAs. The more sophisticated Web features supporting the OCA, The higher its priority rating.

Only one question has been improved in this case. The question "How to support and enable these OCAs?" was improved to "How does this university support

and enable these OCAs, and which ones are more important?" The problem of the original question was that it did not specify who supports and enables the OCAs. Thus, the improved question specifies that it is the university who supports and enables the OCAs. In addition, the second part of the improved question also asks the interviewee to consider which activities or resources are more important for the university to support and enable the OCAs. This can encourage the interviewee to nominate these important activities rather than insignificant activities which are meaningless in depicting a rich picture of how the university supports and enables the OCAs.

There were four improvements made to the OCA Repository. Three of the four were made from the results of the interviews; adding the "communication with the government" activity, renaming the "financial auditing" activity as the "financial management" activity, and also renaming the "maintaining relationships with businesses and local community" activity as the "communication with businesses and local community" activity. One improvement made from the results of the Web site evaluation was merging the "managing information" and "timely provision of student enrolment and academic records" activities into the "timely provision of student personal and academic information" activity.

Because the Web Site Evaluation Forms have been improved greatly in the previous case study, the forms were sufficient to carry out the evaluation task in this case study with the exception of three improvements which needed to be made to the Web Site Evaluation Forms in this case. Firstly, one instruction "the name of the sub-site should be identified from the content rather than the top left corner of the screen" was added into Web Site Evaluation Form 2. Sometimes, the names of the sub-site located on the top left corner of the screen are not matched with the content of the sub-site. In order to avoid confusion when recording the sub-site, it is necessary to unify the way to record the name of the sub-site. The instruction added shows that the content of the sub-site is the basis for recording.

Secondly, a column was added to Web Site Evaluation Form 2 for noting the name of and the way to find sophisticated features which support the OCAs. This can save time to search for the sophisticated features again when filling Web Site Evaluation Form 3A. Furthermore, some common examples of the features which are ranked as level 3 of interactivity were added into Web Site Evaluation Form 3B; for example, the online payment, change of passwords or exchange of personal

information. The purpose was to reduce the time of judging the level of interactivity to sub-sites and therefore increase the efficiency of the Web site evaluation process.

4.1.3 Improvements made in the third to seventh case studies

The total improvements made in the third to seventh case studies were fewer than the improvements made in either of the two previous studies, so, the discussions of all the improvements are combined in this section. The numbers of improvements made in each of the five case studies are shown in Table 4.7.

Table 4.7 *Improvements made in Case Studies 3 to 7*

Case	DF	Questions	OCA Rep	Forms	Instructions	Principles	Total
Case 3	1	5	0	1	0	0	7
Case 4	0	3	0	0	0	3	6
Case 5	0	0	1	0	0	0	1
Case 6	0	2	0	0	0	2	4
Case 7	0	2	2	2	0	0	6

The Prototype OCAWSEM went through a number of significant improvements in the previous two case studies. Table 4.7 shows that very few improvements have been made in each of the subsequent cases. The components utilised for the Web site evaluation comprise the Web Site Evaluation Forms, instructions of the Prototype OCAWSEM and various principles. As shown in Table 4.7, the total number of improvements made to these components is eight. The components utilised for the interviews include the definition of OCAs, interview questions, and OCA Repository. The total number of improvements made to these components is 16. In comparison, fewer improvements have been made to the components which were utilised for the Web site evaluation than for the interviews.

In overall, one important improvement made to the Web Site Evaluation Forms, should be noted here. An instruction has been added into Web Site Evaluation Form 2. This instructs the evaluator that a sub-site which contains only links without any extra information should not be recorded in the Web Site Evaluation Form 2.

Another important improvement was made to the definition of OCAs. In order to elicit OCAs, the definition of OCAs is vital during the interviews. If this is difficult for the interviewees to understand, it is also difficult for them to nominate a list of

OCAs. In the third case, the definition of OCAs was improved to a more understandable description, which incorporated more specific characteristics of OCAs which were identified in the first three case studies. The original definition was "CA is an activity which must be conducted by the university constantly to be successful in the industry". The improved definition is "CA is an organisational priority that is recognised as being essential to short, medium, and long-term success in that industry, has been significantly resourced, and receives regular senior management monitoring and direction". These specific characteristics of OCAs include organisational priority, essential to the organisation's success, significantly resourced, and receiving the attention of senior management regularly. Thus, the improved version of definition is more understandable by the interviewees.

In the third case study, there were four improvements made to the interview questions. Three of them are about adding new questions while two are about abandoning inappropriate questions. The first newly added question is asking interviewees to reveal those messages and emphasis was coming down from the senior management at the moment. This question should be posed when the interviewee has difficulties after they are asked, firstly to nominate a list of OCAs. The second newly added question was asking the interviewee to clarify how the university supports and enables these nominated OCAs. The third question is to ask the interviewee to identify how the university supports the OCAs differently from other universities if the interviewee faces difficulties to answer how the university supports and enables the OCAs. The two abandoned questions are the questions used to ask the interviewee to reveal the differences and competencies of the university. Because differences and competencies are different from OCAs, these two questions are not appropriate for eliciting OCAs.

In the fourth case study, there were six improvements made to the interview questions and principles. Three questions were added to the interview. One common characteristic for these three questions was to confirm the nominated OCAs were the actual OCAs defined in this research. These three questions were used to ask the interviewee to confirm whether the nominated OCA was the one which was actually being conducted by the university or only what they believed that should be conducted by the university; whether the senior management team discussed them regularly; and whether the university spent significant resources on them. The

answers to these questions helped differentiate OCAs from other forms of activities, such as functional critical activities, and job related critical activities.

The three principles added in the fourth case study are two Interview Scoring Principles and one Interview Prioritising Principle. As mentioned above, the newly added questions can be used to discern whether the OCAs, which were nominated by the interviewees, are organisational (desired answer of this research) or functional or the detailed activities supporting the OCAs. Thus, two Interview Scoring Principles are added to prioritise those OCAs which are not organisational. If the activity is a functional activity supporting part of an OCA and being revealed explicitly, a score of five will be given to it. If the activity is a functional activity supporting part of an OCA, and being revealed implicitly, a score of two will be given. From the interview, it was found that the universities tend to give higher priority to the activity which is urgently needed currently. Thus, one Interview Prioritising Principle was added to give a higher priority to the OCA which it is urgently needed by the university.

In the fifth case study, there was only one improvement made. The "sustaining educational funding" activity was renamed. Due to different strategic concerns, the university treats sustaining funding not only needing to deal with the government to sustain the major source of the educational funding, but also needing to generate funding from any other possible sources, such as alumni. Thus, the "sustaining educational funding" is renamed the "sustaining educational funding and extra funding".

In the sixth case study, there were four improvements made. Two are about the interview questions; one is new Web Prioritising Principle; and one is to make all kinds of principles included in the Prototype OCAWSEM to be easy to read. The first improvement made to the interview question is asking the interviewee to nominate a list of "things concentrated on" if he or she has a difficulty in nominating any OCA after being given the definition of OCAs. The second improvement made to the interview question is asking the interviewee to give priority according to which OCA is discussed regularly, resourced significantly, or emphasised most by the senior management.

The newly added Web Prioritising Principle was to solve the problem of prioritising the OCAs when they are supported by exactly the same sub-sites. When the OCAs are supported by exactly the same sub-sites, they are prioritised in the same

levels of effectiveness and efficiency. Under such circumstances, it is necessary to assess the information content in the sub-sites. That supported by more information will have higher priority.

The last improvement made in this case study is that the key words in all kinds of principles are bolded for the purpose of ease of reading. These principles include the Interview Normalisation Principle, Interview Scoring Principle, Interview Prioritising Principle, and Web Prioritising Principle.

In the seventh case study, there were six improvements made. This is the last case study in the OCAWSEM Developing Process. The six improvements were made to the interview questions, OCA Repository, and the Web Site Evaluation Forms. These improvements are encouraging interviewees to express their feelings of how the university defines its success if they are not sure how the university defines its success; asking interviewees about their feelings on the priority of OCAs if they do not know the actual priority; adding the "facility management" activity into the OCA Repository; renaming the "developing strategic plan" activity as the "providing and developing strategic plans" activity; and adding two instructions into Web Site Evaluation Form 1 – "if the sub-site only presents questions, this is not counted as one level of sub-sites", and "if the sub-site belongs to the domain of the university Web site, it must be partially or fully owned by the university".

In total, there were 95 improvements made to the components of the OCAWSEM in the Developing Case Studies. These improvements can be found in the Developed OCAWSEM (see Appendix 2). The following section will discuss more details of the improvements made to each of the components of the Prototype OCAWSEM in the Developing Case Studies.

4.2 Improvements made to the Interview Guide

The Interview Guide includes the definition of OCAs and a set of interview questions which should be posed in the interview. It is the basis when conducting the interviews in this research. This section will show the improvements which were made to the Interview Guide in the Developing Case Studies.

The semi-structured interview allows interviewers to ask not only the structured interview questions included in the Interview Guide, but also extra ones

which are more interactive (or unstructured). During the case studies, some extra and interactive interview questions were added into the Interview Guide. To avoid confusion, two kinds of interview questions are clarified here. The first kind is termed "Formal Interview Question" in this thesis. This kind of interview question typifies the interview question which is crucial to elicit OCAs from management and must be asked during the interview. The second kind is termed "Interactive Interview Question" in this thesis. This kind of interview question is posed only when the interviewee has the difficulties in answering the Formal Interview Question.

Both of these two kinds are termed "interview questions", and they are included in the Interview Guide. Because the Interactive Interview Questions are posed only when the interview faces difficulties in answering the Formal Interview Questions, they are listed separately from the Formal Interview Questions in the Interview Guide.

In total, the improved Interview Guide includes the definition of OCAs, Formal Interview Questions, and Interactive Interview Questions. The improvements made to each of them are discussed in the following subsections.

4.2.1 Definition of OCAs

The definition of OCAs was amended once in this research. The new definition provides a more precise description of the OCAs to the interviewee, who therefore had a clearer understanding of the characteristics of OCAs in order to achieve a more reliable result. The original definition, as listed below, was given to the interviewees in the first three case studies:

> *An organisational critical activity is an activity which must be conducted by the university constantly to be successful in the industry.*

The key words in this definition are "constantly" and "successful". In this sense, it is expected that the interviewee can identify the activities which are conducted constantly and help the university achieve its success. There were sixteen interviews conducted in the first three case studies with sixteen interviewees involved. However, six interviewees were not able to nominate any OCA after they were given this definition. They revealed that they did not understand the meaning of OCAs. That

shows that more than one third of the total interviewees involved in these case studies could not understand the definition properly.

According to the responses made in the first three case studies, three major characteristics of OCAs were found:

1. The senior management have discussed and monitored it regularly, and have the responsibility to manage it (two interviewees).
2. It is a strategic priority (one interviewee).
3. It has been significantly resourced (two interviewees).

Therefore, this definition has been modified into a richer and better defined form, and has been given to the interviewees in the rest of the case studies conducted in this research:

> *An organisational critical activity is an organisational priority that is recognised as being essential to short, medium, and long-term success in that industry, has been significantly resourced, and receives regular senior management monitoring and direction.*

In this version, the key words include "organisational priority", "significantly resourced" and "regular senior management monitoring and direction". The word "constant" has been removed while the "success" has been extended to "short, medium, and long-term success".

Concerning the word "constant" and "success", many activities are conducted constantly by the university and are critical to its success. For example, the universities have to pay their staff constantly. If they do not perform this activity well, it will affect their success by risking a strike from the staff. Although this activity is constantly conducted and important for university's success, none of the eighteen interviewees nominated this. This shows that OCAs must be the activities which are constantly conducted by universities; however, the activities constantly conducted are not necessarily OCAs. To avoid this confusion, the word "constant" was replaced by the description "regular senior management monitoring and direction".

The new version of definition of OCAs helped the interviewees nominate a list of OCAs more easily in the next four Developing Case Studies. In total, another 20 interviewees were given this new version of definition, and 18 could nominate a list

of OCAs immediately. Table 4.8 (see next page) compares how effectively the two versions of definition of OCAs were used to elicit OCAs from the management in the Developing Case Studies.

Table 4.8 *Comparison of the response rates of the two versions of definition*

	Interviewees		
Definition of OCAs used in Cases	***Interviewed in the Cases***	***Number able to Nominate***	***Percentage able to Nominate***
Case 1~3	16	10	62.5%
Case 4~7	20	18	90.0%

According to Table 4.8, the percentage of interviewees who were able to nominate a list of OCAs was increased from 62.5% to 90% when the definition of OCAs was improved from the original version to a new version. This shows that the new version is more effective to elicit a list of OCAs from management.

In particular, some interviewees did confirm that the activities listed in the OCA Repository have these characteristics added into the new version of definition of OCAs. For example, one interviewee confirmed that the senior management did spend a significant amount of time for monitoring the OCAs when he was asked whether the senior management spent a lot of time on the OCAs:

> *Well, senior management team spent a lot of time on those things [the OCAs], absolutely.*

The other interviewee also agreed that OCAs are significantly resourced:

> *The PBRF [Performance-Based Research Fund] has basically forced the university at the strategic level to start investing in meeting its requirements. Like the collection time last time cost us millions of dollars in staff time and things to try to get all that information... So, on the strategic level, PBRF for research thing is essential.*

Based on these results, the key words "organisational priority", "significantly resourced", "regular senior management monitoring and direction", and "short, medium, and long-term success" should be included in the definition of OCAs. By containing these key words, the new version of definition of OCAs was more effective in eliciting a list of OCAs from management.

4.2.2 Formal Interview Questions improved

The Formal Interview Questions improved are those in which some of the words have been changed. The major reason for the change is that the questions were unclear, and therefore interviewees were not sure how they could give answers to the question or the question misled the interviewees into giving a poor answer.

The Formal Interview Question "How do you support and enable these organisational critical activities?" was originally designed for understanding how the university supports and enables the OCAs which were nominated by the interviewees. This understanding helps clarify the meanings underlying the terms of these OCAs which were nominated by the interviewees. However, when asked this question, some interviewees answered from the perspective of the university while some answered from a personal perspective, particularly the functional managers. Some interviewees even were not sure what perspective should be adopted. For example, one interviewee was asked to describe how to support the OCAs and to give some examples. However, she was not sure what perspective should be taken, and she answered:

I am not sure what your question is. Do you mean how I support them?

Then, the interviewer further explained to her, not from her perspective, but from the university's perspective. Thus, this Formal Interview Question was changed to "How does the university support and enable these organisational critical activities?"
However, only the change in regard to the perspective was not enough. When asking how the university supports the OCAs, there are too many activities to support a particular OCA. For example, one interviewee was asked to describe how the university supports and enables the "communication with students and the community" activity, he answered:

Many different levels.

Because it is impossible for the interviewee to discuss all activities, the Formal Interview Question was further improved to "How does this university support and enable these OCAs, and which ones are more important?" For example, one interviewee answered that many different levels of activities can support and enable the "communication with students and the community" activity, the interviewer then

further asked him what the most important ones were. Thus, this interviewee was able to reveal some important ones:

> *For students, the important things are contacting schools, through the Web, publications, the Liaison work…by involving them [the community] in the university as well, which we do in two ways; one is by having an Advisory Group and with industry representatives on them. The other way is through Adjunct Appointment.*

As discussed above, there is only one Formal Interview Question listed in the Interview Guide improved. The question was "How do you support and enable these organisational critical activities?" It was improved to "How does this university support and enable these OCAs, and which ones are more important?" The improved question was able to generate more reliable results.

4.2.3 Formal Interview Questions newly added

In total, two Formal Interview Questions were added into the Interview Guide. One is "How does this university define its success?" and the other was "How does this university compete with other universities?" These two Formal Interview Questions should be posed before giving the definition of OCAs to interviewees.

There were two reasons for adding these two questions. Firstly, they could help interviewees refresh their minds on the relevant strategic context of the case in order to nominate OCAs more easily. Relevant strategic contexts are those which have a strong impact on what OCAs the university is conducting and includes for example, the definition and criteria used to measure a successful university, or the competitive environment and how the university deals with it. After revealing the relevant strategic context, the interviewees could nominate the OCAs based on the context which they had already revealed.

Secondly, they could also help elicit the OCAs from management. Two kinds of OCAs were found in the case studies, the "Explicit OCA" and the "Implicit OCA". Explicit OCAs are those OCAs nominated by interviewees explicitly after being given the definition of OCAs. In contrast, the Implicit OCAs are those OCAs which interviewees do not nominate; however, they are revealed in the other parts of the interview implicitly as critical to attain the success of the university. As discussed in

the first reason, the newly added Formal Interview Questions encourage the interviewees to share more on the strategic context of the case. Because OCAs have a strong interrelationship with the strategic context, it is more likely that the Implicit OCAs can be identified from the answers given by the interviewee for the description of their strategic context.

The results show that the two newly added Formal Interview Questions could help elicit the Implicit OCAs from management. For example, one interviewee nominated three OCAs; the "developing research", "teaching and learning", and "maintaining relationships with businesses and local community" activities. However, after he was given the two newly added Formal Interview Questions, he further revealed in the later conversation that the "providing student accommodation services" activity was critical to their success. They had spent a significant amount of resources on this activity:

> *We always have this kind of accommodation issue. We spent a quite of money on accommodation, and we need to spend more, and we will be. We had very high demand last year and this year. That will continue.*

Because the "providing student accommodation services" activity is part of the "providing student services" activity which is listed in the OCA Repository, this interviewee actually nominated the "providing student services" activity as an OCA. In addition, this nomination was made implicitly.

Another example can be found in one interview. The interviewee nominated three OCAs explicitly after she was given the definition of OCAs and required to nominate a list of OCAs. These OCAs were the "developing research", "efficient teaching and learning" and "enhancing internal administrative efficiency" activities. After being given the two Formal Interview Questions, she further revealed that the university had recently transformed itself from a polytechnic to a university. Thus, it was crucial to invest a great deal of effort on branding itself as a university in order to change the perceptions of the public on the brand of the university:

> *When we talking to people outside the university, when I talk to people in the industry, they talked about University A as a tech …They don't even see us as a university. We are going to turn that around, we going to change it. We are university …That's critical.*

In this case, the "increasing the branding" activity was nominated implicitly by the interviewee. Thus, the "increasing the branding" activity is considered as an Implicit OCA nominated by her.

According to these examples, the two newly added Formal Interview Questions could help elicit both the Explicit OCA and the Implicit OCA. Both have been added into the Interview Guide.

4.2.4 Interactive Interview Questions newly added

In total, eight Interactive Interview Questions were added into the Interview Guide. They were given to interviewees on five occasions. These occasions are discussed below.

The first occasion was when the interviewee was not sure of how the university defined its success. When asked how the university defines its success, some interviewees revealed that they were not sure of this. For example, when asking to comment on how the university defines its success, one interviewee responded immediately that he was not high enough in terms of management level to answer that question. If this is the case, one Interactive Interview Question should be posed, that is, "According to your feeling, how does this university defines its success?" This question was used to further encourage the interviewees to express their feelings on how the topic. For example, one interviewee was unable to share on how the university defined its success. But when encouraged to express his own feeling, he shared useful answers:

> *It seems to me that running university is much like balancing it. You try to balance things like research statistics, teaching quality and its money… A successful university probably has to do two things which are producing high quality research outputs and producing well taught students…*

It is important to differentiate between asking the interviewee to reveal how the university defines its success and asking the interviewee to express his or her feeling on how the university defines its success. In terms of asking how the university defines its success, this question concerns the actual view from the university. In

contrast, asking the interviewee to express his or her feeling on how the university defines its success concerns the interviewee's feeling. Although the feeling given by the interviewee may not be the actual view of the university, asking the interviewee to express his or her feeling on how the university defines its success can help understand the university. Then, this understanding can help elicit OCAs.

The second occasion was when the interviewee was not able to nominate any OCA after being given the definition of OCAs. Some interviewees, when given the definition of OCAs, said that they did not understand this definition, so were not able to nominate any OCA. Because the notion of OCAs is new, it is not surprising that some of them were not able to nominate any. This research identifies three scenarios that happen when the interviewee cannot nominate any OCA.

In the first scenario, the interviewee did not remember the definition of OCAs. Thus, the interviewee was given the definition of OCAs again and then asked to nominate a list of OCAs. In the second scenario, the interviewee did not know any OCA at all. Thus, one Interactive Interview Question should be posed, that is, "What are the messages or emphasis coming down from the senior management team at the moment?" This could be used to identify OCAs. In the third scenario, the interviewee did not understand the meaning of OCAs. Thus, one Interactive Interview Question should be posed, that is, "What are the important things, top priorities, and things being concentrated on at this university at the moment?" This will elicit a list of this information, which can then be identified as OCAs. More discussions on these scenarios and the Interactive Interview Questions which should be posed can be also found in Chapter 6.

After the interviewee identifies a list of OCAs, it is important to differentiate whether these OCAs are based on what they felt that the university should be conducting or the university was actually conducting. In other words, it is about whether those are the OCAs given by the interviewees based on personal feelings or actually based on the ones being conducted by the university. It is possible that the activity is felt by the interviewee as the OCA which should be conducted by the university; yet, this activity is not so critical to the university actually or the university is not conducting this activity currently. This research focuses on eliciting the OCAs which are being conducted by the university and are critical to the university's success as nominated from interviewees. Thus, another Interactive Interview Question

should be posed, that is, "Are those nominated organisational critical activities you believe are being conducted currently and are they critical to the university's success?" For example, one interviewee was asked to confirm whether her nomination of OCAs was matched with those of the university. She confirmed that his answers were matched with the university's OCAs.

The third occasion was when the interviewee had difficulties in answering the Formal Interview Question "How does the university support and enable the OCAs?" As discussed previously in Section 4.2.2, interviewees were asked how the university supported and enabled the OCAs, and which ones were more important to be supported. If they had difficulties in answering this question, one Interactive Interview Question should be posed, that is, "How does this university support these organisational critical activities specifically and differently from other universities?" This question was used to ask them to address how the university supported these activities specifically and differently from other universities. Thus, the sequence for asking the interviewees in regard to how the university supports the OCAs was to first ask how the university supports and enables the OCAs, and which ones are more important to be supported. Secondly, if they had difficulties, to ask how the university supported the OCAs specifically and differently from other universities.

The fourth occasion was when the interviewer needed to confirm how valid and reliable the nominated OCAs were. Two Interactive Interview Questions were utilised to confirm whether the OCAs, which the interviewee nominated, were matched with the characteristics of the OCAs identified in this research. One is "Does the senior management team discuss these organisational critical activities regularly?" The other is "Does this university spend a lot of resources on these organisational critical activities?"

The fifth occasion was when the interviewee could not prioritise the nominated OCAs. After the interviewees nominated a list of OCAs, they were asked to prioritise their list. However, some could not prioritise them. For example, one interviewee revealed that she would have bias in prioritising the OCAs. Thus, one Interactive Interview Questions should be posed to ask about which OCA is discussed regularly, resourced significantly, and emphasised most by the senior management. The question is "Which one is discussed regularly, resourced significantly, and emphasised most by the senior management team at the moment?" Some interviewees

cannot know whether the senior management team emphasises, resources or discusses the OCA often, because they are not involved in the senior meetings. In this case, again, the interviewees were asked about their feelings.

4.2.5 Formal Interview questions abandoned

Three Formal Interview Questions were abandoned in the Developing Case Studies. It is important to note here that adding the interview questions was a tentative testing. When adding new interview questions, it is believed that some will function well in the next case studies whereas some may not. The newly added interview questions shown in previous two sections represent those which worked consistently well in the remainder of the case studies after the case study in which they were posed. Some of the newly added questions, which did not work effectively in the later cases, were abandoned from the Interview Guide. This section will discuss these interview questions.

It was inappropriate to pose the question "What are the differences between this university and others?" as a Formal Interview Question to understand the strategic context of the university. As discussed previously in Section 4.2.2, it was helpful to ask interviewees about the strategic context of the university before giving the definition of OCAs to interviewees. To achieve this end, the question "What are the differences between this university and others?" had been posed. However, this is an inappropriate question as the difference can be any aspect. For example, one interviewee revealed that the campus, quality of teaching and the city are the major differences between his university and other universities:

> *It's the campus, the quality of our teaching, and it is a very student friendly city. In City H, about 1 in 5 people is a tertiary student at the university, polytechnic, or college education, 1 in 6 is a university student.*

Another interviewee at the same university believed that excellent student services and living style, quality teaching and positive feedback given from the graduates were major differences between that university and other universities:

> *They [the graduates] believe they get quality education and great living quality. The city is set up to deal with students and they are always proud*

to say they are from University H. So, they get quality education through quality teachers.

However, some of differences may not be proper to describe the strategic context of the university. In addition, these differences are sometimes the results of conducting the OCAs. They are not the means which cause the university to conduct certain OCAs. Thus, the question "What are the differences between this university and others?" should be avoided during the interview.

It is also inappropriate to pose the question "What are the competencies of this university?" as a Formal Interview Question to understand the strategic context of the university. The university's competencies are the strengths of the university, and are also critical to the university's success. However, when asking interviewees to reveal the competencies of the university, they tended to answer some specific courses and subjects in which they were performing strongly. For example, one interviewee specified some subjects as the competencies of the university:

As I mentioned, in Engineering, and Science, our Science has come out very well, and in Law, and some parts of Arts, such as Sociology, Social Science, but particularly Engineering and Science are very strong here.

One interviewee was asked the competencies of the university, and he answered with specific subjects and facilities:

We are very strong in medical science and bio-medical sciences. Some faculties are also very strong, in School of Business, Marketing, Tourism and Law.

Since strong courses and subjects are not OCAs and they are not the strategic context of the university, it is inappropriate to ask the interviewees to reveal the competencies of the university. Therefore, the question "What are the competencies of this university?" should be avoided in the interview.

It is inappropriate to pose the question "What are the critical projects in this university?" as a Formal Interview Question to elicit the OCAs. The critical projects at the university level are conducted by the university currently and are critical to its success. They can be confused as being equal to OCAs. In the earlier stage of the case

studies, interviewees were given the question "What are the critical projects in this university?" This question was used to elicit a list of projects which are critical to the university's success. However, the results show that the critical projects for universities are different from the OCAs. For example, one interviewee explained that they added a range of projects to support OCAs. He then revealed that redesign of Web site is one of important projects of the marketing activity:

> *So, we had these goals [he meant OCAs] but no way to achieve them apart from just little projects... When we get the operation plan, that's when we can put the projects into place that we can actually achieve some of these things [he meant OCAs]… I will say it was the marketing campaign. It comprises a lot of projects. One of which is the Web site.*

This example shows that a critical project can support an OCA. Yet, it is not an OCA. Since critical projects are different from OCAs, the question "What are the critical projects in this university?" should be avoided in the interview.

In a summary of Section 4.2, the definition of OCAs and the interview questions included in the Interview Guide in the Prototype OCAWSEM were improved. The improved Interview Guide can be found in the Developed OCAWSEM (see Appendix 2). This newer version of Interview Guide is able to elicit a list of OCAs from the management more effectively than that included in the Prototype OCAWSEM.

4.3 Improvements made to the OCA Repository

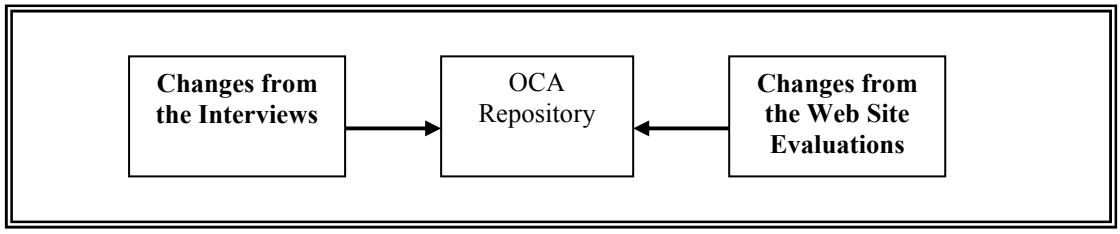
Originally, there were 29 OCAs listed in the OCA Repository in the Prototype OCAWSEM. They were developed based on the generic OCAs shown in Table 2.4 in Section 2.2.2 and relevant empirical studies on university Web sites. During the OCAWSEM Developing Process, the content of the OCA Repository was constantly being improved. Four kinds of improvements were made to the OCA Repository.

The first one was the adding the new OCAs. Some OCAs were revealed in the case studies, yet they were not listed in the OCA Repository. Thus, they are added into the OCA Repository. The second was renaming the OCAs. Once the result of the case studies showed that the term for a particular OCA was inappropriate, this OCA

would be renamed with a proper term. The third and fourth kinds are merging and dividing the OCAs. In some cases, the results show that some OCAs listed in the OCA Repository should be merged or divided, and these improvements would be done accordingly.

The improvements made to the OCA Repository came from two sources – the interview and Web site evaluation results (see Figure 4.1). From the interview, for example, an interviewee nominated an OCA which was not listed in the OCA Repository. From the Web site evaluation results, for example, the Web site showed that it supports an OCA which is not listed in the OCA Repository.

Figure 4.1 *Sources of improvements made to the OCA Repository*



One dilemma which needs to be considered when improving the terms in the OCA Repository is how broad/narrow the coverage of the term should be. For a broader term, the OCAs nominated by interviewees are more likely to be covered in the term. The weakness of this approach is that more Web information and sub-sites would be evaluated as supporting this broader activity. This would make it more difficult to analyse how well the Web site supported the specific activities with this term individually. A narrower term may not be able to cover the OCAs nominated by interviewees. However, it would be easier to analyse how well the Web site supported the specific activities individually.

For example, the "external communication" and "internal communication" activities are broad terms to describe a number of activities. The "external communication" activity is to communicate with external stakeholders including current students, prospective students, alumni, local communities, the government, and other external parties. The "internal communication" is to communicate with internal stakeholders including managers, academic staff members, administration staff members, and other internal parties. In this research, these two activities have been divided into several, such as the "communication with businesses and

community", "advertising", "maintaining relationships with previous students", and "communication with the government and recruiting staff" activities. Thus, the result of the Web site evaluation has more ability to indicate how well the Web site supports these specific activities individually.

In regard to this dilemma, the approach adopted by this research is to learn from the results generated from the interviews and Web evaluations. The terms of OCAs either given by the interviewees or indicated by the Web sites were seriously considered for improving the terms included in the OCA Repository.

The following sub-sections will present the improvements made to the OCA Repository, and discuss why these improvements should be made. These improvements were adding, renaming, merging, dividing, and alphabetically listing the OCAs in the OCA Repository.

4.3.1 OCAs newly added

In terms of judging whether this is a new OCA, the definition of OCAs is the basis. Moreover, two helpful guidelines can assist the judgement of the results made from the interviews and Web site evaluations. For the result of interviews, if an activity is an OCA, the interviewees must nominate this activity as an OCA explicitly or implicitly in the interview, and the analysis of the interview results must prove that this activity is critical to the university's success. For the result of Web site evaluations, if an activity which is being supported by the Web site is recognised as an OCA, the activity must be critical to a university's success.

The results made from the Developing Case Studies show that two OCAs indicated by the Web sites, however, were not listed in the OCA Repository. They are the "enhancing internal administrative efficiency" and "maintaining relationships with previous students" activities. Both of them were added into the OCA Repository.

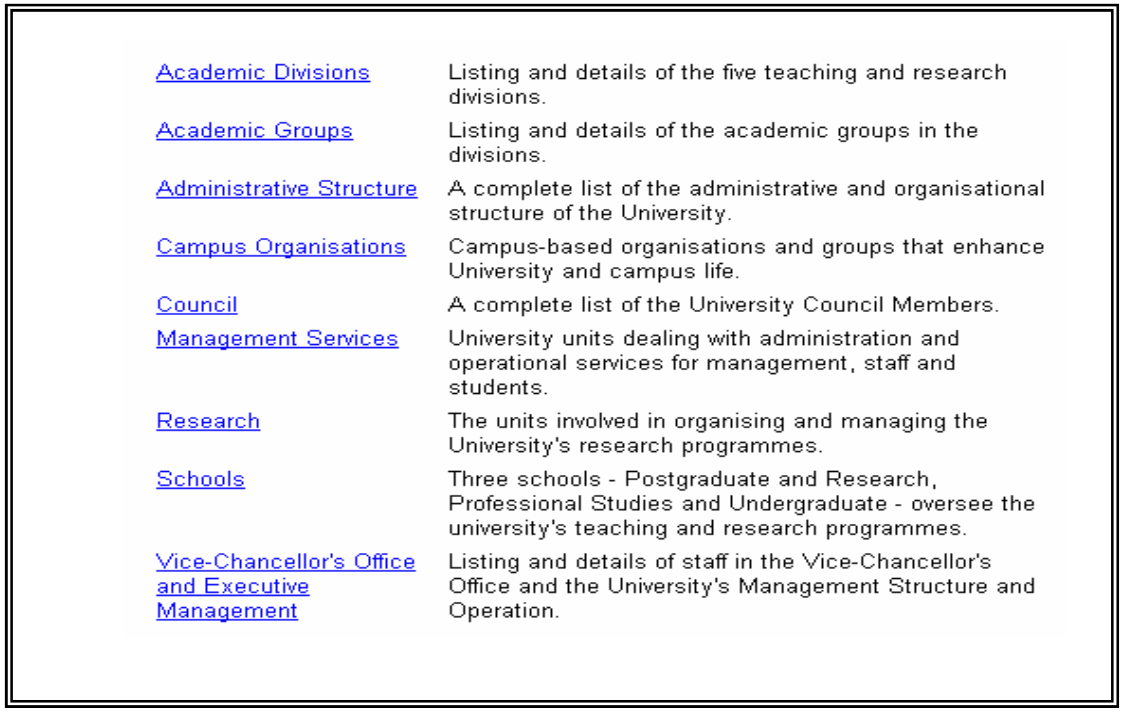
The "enhancing internal administrative efficiency" activity is found being supported in the case study of University F. The Web site of University F includes a sub-site entitled "University Administration" which provides the information required by staff for conducting some administrative work. This sub-site includes nine major hyperlinks on the left hand side referring to the details of various kinds of service and academic divisions, the operational and organisational structures of the university, and

the staff members in the senior management team. These hyperlinks are shown in Figure 4.2.

This sub-site is accessed through the Internet. Not all information related to internal administration is presented in this sub-site, possibly due to secrecy concerns. However, staff members can find some information which is required to conduct their basic administrative work here. This sub-site saves their time in searching for relevant information. In a later case study, one interviewee revealed that the "enhancing internal administrative efficiency" activity is an OCA to their university. This confirms that this activity can be an OCA to the universities in New Zealand:

> *So, it's about how we get more effective and efficient in the way that we manage our business, from business side of the equation anyway, it's also about how we continue to maintain student service levels with basically the same budget in a lot of places and yet greatly increase student numbers.*

Figure 4.2 *The nine hyperlinks in the administration sub-site of University F*



Academic Divisions	Listing and details of the five teaching and research divisions.
Academic Groups	Listing and details of the academic groups in the divisions.
Administrative Structure	A complete list of the administrative and organisational structure of the University.
Campus Organisations	Campus-based organisations and groups that enhance University and campus life.
Council	A complete list of the University Council Members.
Management Services	University units dealing with administration and operational services for management, staff and students.
Research	The units involved in organising and managing the University's research programmes.
Schools	Three schools - Postgraduate and Research, Professional Studies and Undergraduate - oversee the university's teaching and research programmes.
Vice-Chancellor's Office and Executive Management	Listing and details of staff in the Vice-Chancellor's Office and the University's Management Structure and Operation.

The "maintaining relationships with previous students" activity is the other OCA which was added into the OCA Repository. To maintain the relationships with previous students, University F also provides another sub-site called "Alumni

Association" which plays a crucial role to support the OCA. This sub-site allows the graduates to join the association, to update their contact information, to buy some memorabilia from the university and even to apply for the university's bursaries. Both University F and the graduates can know each other more by using this site. Thus, the relationship with the alumni can be built up and maintained through the interaction with this sub-site. This research also found that the Web sites of all cases contain a sub-site to maintain the relationship with the alumni. In a later case study, one interviewee also revealed that the "maintain the relationships with previous students" activity is an OCA to that university. By conducting this activity, the university can receive more funding, have the opportunity to recruit students from alumni and create a better image in the community:

> *The amount of contribution to university costs coming from central government is decreasing as a portion as the total. As that happens, it's more and more important to look for other resources to generate funding… Also, for the reason that many and many students these days – we talk about life long learning – many students are not one time students…So, keeping in touch with past students is key element for the university because they are also very good ambassadors of the university in the wide community.*

While two new OCAs were found from the Web site evaluations, two also were nominated from the interviewees. The Web site evaluations also confirmed that the university Web sites are supporting these two activities. The first one is the "communication with the government" activity. This activity was firstly nominated by one interviewee. He nominated this activity as an Explicit OCA after he was given the definition of OCAs:

> *It is absolutely vital to be successful in the way that I said… how we communicate with the government.*

From the same case study, another interviewee revealed the reason why communicating with the government is critical. It is because the universities in New Zealand have received a significant amount of budget from the government. In order to sustain the budget, they have to meet the government's requirements:

> *But as an institution on a day-to-day basis, then we have to measure our success also in terms of our budget being meeting the government's requirements.*

Another interviewee further revealed that the amount of the funding received from the government can be critical to the success of the universities in New Zealand:

> *So, PBRF gives you a measure of our success, and it's a funding mechanism. So, more money you get out of the system, the more successful you are.*

One interviewee also pointed out that the government's policies can create the environment of the tertiary education in New Zealand. Thus, complying and dealing with these policies properly is fairly vital to the success of the universities within this environment:

> *The successful of tertiary education in all universities in New Zealand is wholly relied on government policies. So, the atmosphere is entirely created by government policies.*

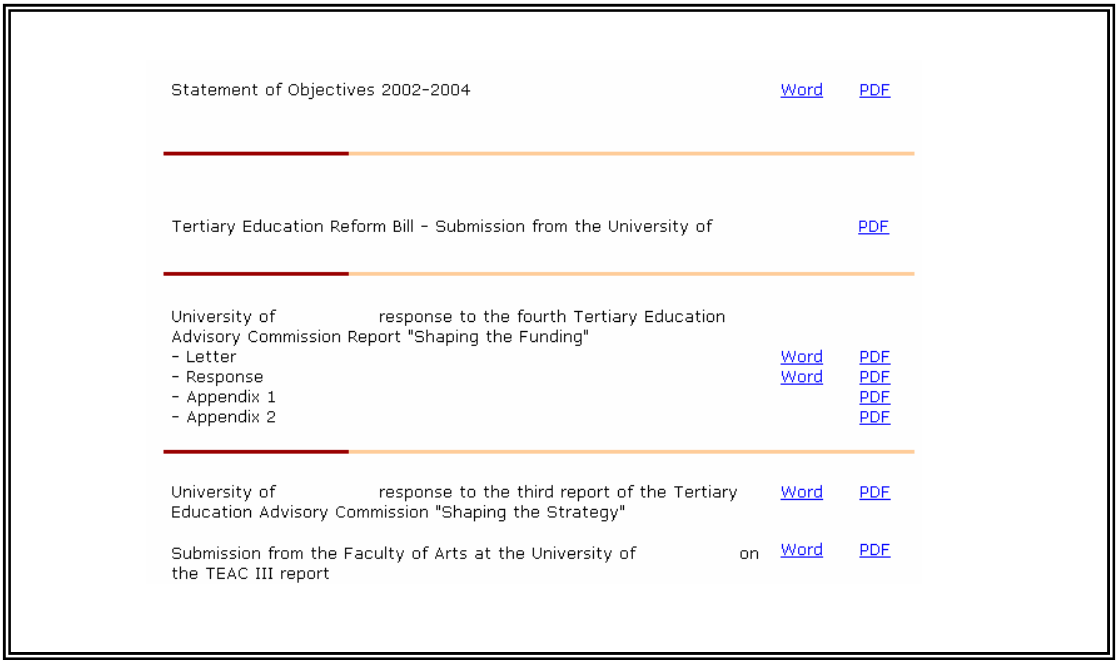
Thus, universities have to communicate with the government well in order to succeed in the industry. University G has a sub-site called "External Documents" to support this university to communicate and maintain the relationship with the government. This sub-site provides the one central place for the members who are in charge of communicating with the government accessing important documents, policies, and reports (see Figure 4.3 on next page).

Moreover, these documents and reports can be used to compose important reports to submit to the government in the future. Thus, the "maintain the relationships with previous students" activity is reflected on the university Web sites.

The second OCA newly nominated from the interviewees was the "facility management" activity which means involving the utilisation of resources effectively. This was nominated as an Implicit OCA by one interviewee:

> *So, I think the emphasis is more on how to use our resources effectively, and how to increase the resources.*

Figure 4.3 *Some of the documents, policies, and reports provided by University G's sub-site*



The interviewee also said that they have spent a significant amount of budget on rebuilding their campus:

> *Having said that, we went through a process over the last four or three years; we spent a lot on capital to rebuild the campus.*

Another interviewee at the same university also revealed that the "facility management" activity is a high priority at the moment for the university because they need to upgrade their campus infrastructure. Furthermore, this interviewee also used the words "catch up" in the interview, and described how the priorities of the university had been changed:

> *For us, it has been simply getting more campuses. We need more buildings to put all the students in. So, it's about improving our facilities because we went through a deficit situation for two years. There was a situation where no large maintenance on any building was done. So, subsequently now we had a two year catch up period – been furiously upgrading buildings, that sort of thing… So, in some ways there has been quite a change in the way that the university has prioritised things.*

According to the results, the manager believed that the "facility management" activity should have had higher priority a few years ago, however it did not. They needed to catch up now. This implies that this activity is a critical and constant activity for the university.

The results made from the Web site evaluations confirm that the "facility management" activity is reflected on the university Web sites. Universities do provide information to support this OCA. For example, the Web site of University D contained a sub-site called "Facilities Management". This sub-site provides the relevant information and interactive features required for the management in managing the facilities in the universities, such as enabling parking services for staff, students, and visitors, room booking services to lecturers and supplying some important policies of facility management. Thus, the "facility management" activity is reflected on the university Web sites.

4.3.2 OCAs renamed

The "financial auditing" activity was listed in the OCA Repository in the Prototype OCAWSEM before conducting the Developing Case Studies. This activity was renamed as "financial management". The term "financial management" was given by one interviewee. She nominated the "financial management" activity as an Explicit OCA, and revealed that this is a continuing activity:

> *Obviously, things like financial management are the things that are constantly discussed.*

The term "financial management" is more appropriate than the term "financial auditing" to be an OCA. The reasons are firstly, the interviewees tended to utilise this term rather than the "financial auditing". One interviewee mentioned financial management as an Implicit OCA:

> *I think what has changed is the effort we put in to use that money more effectively.*

Secondly, the term "financial auditing" only concerns a narrow aspect of the term "financial management". It can be an activity supporting the OCA – the "financial

management" activity. Thus, the "financial management" is broader and appropriate to cover the financial activities revealed by more interviewees.

The result of Web site evaluations shows that the "financial management" activity is reflected on the Web sites. Most of the university Web sites in New Zealand contain financial sub-sites. For example, University G provides a financial sub-site. This sub-site is used to provide forms and some online transaction features to support activities relating to the "financial management" activity. This shows that the sub-site supports activities more than just financial auditing. The term "financial auditing" is too narrow to describe the OCA supported by the Web site. Thus, the term "financial management" is more appropriate than the term "financial auditing".
The term "maintaining relationships with businesses and local community" was renamed "communication with businesses and local community". One interviewee has used this new term:

> *It is absolutely vital to be able to communicate with your community interests. Our community interests need to know what we are doing and why we are doing it, and why it is important. They need to know that we are interested in their aspirations…So, it's doing much about all the level of institution from the top down to individuals. How we communicate with the community and with businesses…*

This shows that universities are not only maintaining relationships with businesses and local community, but also letting businesses and local community know the purposes of the university's existence. For example, University G provides a sub-site named "Communication and Development" to support the communication with various stakeholders including businesses and communities. University A also provides a sub-site called "Community Partnerships" to maintain partnerships with the local community. This sub-site is under the "Communications and Marketing" sub-site. These two universities tend to refer to the maintaining relationships with businesses and local community as a communication activity. Thus, this shows that the term "communication with businesses and local community" is more appropriate than the term "maintaining relationships with businesses and local community".

The term "training staff" was renamed "developing staff". University F has a sub-site called "Staff Development" where the information presented is used for both

training new staff and developing current staff's personal knowledge. In addition, the university not only trains staff skills, but also develops staff knowledge. Thus, the term "developing staff" is more appropriate than "training staff".

The term "sustaining educational funding" was renamed "sustaining educational funding and extra funding". The reason is that universities not only sustain educational funding from the government, but also sustain funding from other sources. For example, one interviewee commented that the university has to maintain relationships with alumni in order to encourage them to make donations to the university, and that the funding from the government which is available to universities in New Zealand is decreasing. Thus, they have to find extra sources of funding.

The results from the Web site evaluations confirm that universities not only sustain educational funding from the government, but also from other sources of funding. For example, University B provides a sub-site to encourage alumni to donate money to the university. This shows that universities not only search for funding sources from the government, but also from the alumni. Thus, the term "sustaining educational funding" is more appropriate than "sustaining educational funding and extra funding".

The term "imaging, branding, and reputation" was renamed "increasing the branding". According to the Web site evaluations, most of the Web pages included in the Web sites showed a consistent design with universities' printed marketing materials in terms of colour, pictures and font size. This does support universities' drive to increase its branding. However, the evidence which proves that the Web site supports increasing image or reputation is lacking both from the results of the Web site evaluations and interviews. Thus, the term "increasing the branding" is more appropriate.

The term "developing strategic plans" was renamed "providing and developing strategic plans". This term is more appropriate because the case results do not reveal that the "developing strategic plans" is an OCA, but that "providing and developing strategic plans" does. The results show that disseminating the plan to all the management is critical to the development of strategic plans. The case study of University D is a good example to demonstrate this argument. The University D's Web site provides an intranet sub-site to supply the strategic plan of the university including a ten-year plan and the current strategic plans to help develop future

strategic plan. One interviewee at the university also said that the senior management team requires every school and central service unit to submit their three-year strategic plans:

> *There's been a lot of more strategic work done by the senior management team in last two years. In particular, that's been a drive for our senior management team to get every single school and faculty in central service unit to have a three year strategic plan, and there's been a process that every single unit has gone into, to write a three-year strategic plan and submit it.*

The purpose is for the management in schools and central management levels to download the university's strategic plans from the Web site and review the plans in order to develop their plans. Then, the developed school-level and unit-level plans are also provided on another sub-site. Both the senior management team and the management in schools and central services units can review these plans on the Web site while they are developing either strategic plans for the university or other levels of strategic plans. Based on the results from both from the Web site evaluation and interviews in this case study, the term "providing and developing strategic plans" is more appropriate than "developing strategic plan".

4.3.3 OCAs merged

The activities of "sustaining research income" and "conducting research" are merged into "developing research". Actually, there is an interrelationship between these three activities. Most often, the researchers in the university conduct research and build up their research output. This kind of output is one of the major bases for the university to sustain research funding. Thus, the "developing research" activity covers the "conducting research" and "sustaining research funding" activities. For example, University F provides a sub-site called "Research at University F". The purpose of this sub-site is to help the internal researchers initiate their research themes and projects, attract external researchers to cooperate with these research projects and then enhance their research output and promote their research outputs to sustain research funding. The information contained in this sub-site provides the information needs for conducting research and sustaining research funding. This shows that University F's

Web site not only supports the "conducting research" and "sustaining research income" activities, but also the "developing research" activity. Thus, the activities "conducting research" and "sustaining research income" were merged into "developing research".

The "managing information" and "timely provision of student enrolment and academic records" activities were merged as "timely provision of student personal and academic information". The managing of information is a broader term which covers different kinds of activities, such as managing internal administrative information, enrolment information, or students' academic information. Some of the kinds of activities were already covered by other OCAs: for example, the managing of financial information should be covered in the "financial management" activity. One aspect this term did not cover and was not covered by other terms was the "provision of student personal information". Thus, the "managing information" activity was combined with the "timely provision of student enrolment and academic records" activity as "timely provision of student personal and academic information" in this research.

The Web site evaluation also shows that the sub-site supplies both the academic and personal information of students. For example, University G provides a sub-site to provide the academic and personal information for students. Students can search for their academic transcripts and change their course information. It also provides the "Change Address" and "Enrolment Info" hyperlinks to allow students to retrieve and modify their personal information. Thus, the term "timely provision of student personal academic information" is more appropriate to cover the "managing information and timely provision student enrolment" and "academic records" activities.

4.3.4 OCAs divided

The "recruiting students" activity was divided into "recruiting domestic students" and "recruiting international students". The management of University F also regarded student recruitment as concerning these two activities. Many interviewees recognised that the student recruitment should be divided into these two activities specifically rather than one. As one interviewee pointed out, domestic and international recruitment are their two focuses of recruitment activity:

> *I think we have two major focuses, one is recruiting international students. We have a very different strategy than most other New Zealand universities. It's about being different. The other one is this university recruits most of its students from other parts of New Zealand.*

Most universities have separated departments for domestic and international recruitment. For example, both University A and University G have two separate marketing groups in charge of international and domestic recruitment. One interviewee noted that these two groups have different focuses. The domestic one focuses on the graduates from domestic high schools, while the international one has to recruit internationally:

> *So, the people go out to visit schools, they run expos, they have a call centre to field all sorts of calls and deal with the responses and questions coming from the Web site, and they also target adult students as well. But the bulk of students coming in are obviously school leavers. The separate group, the international group, they go and recruit students internationally. They are not part of the directorate, they are a separate team.*

When asked whether they have any problem to recruit international students in such a large-population city, the interviewee responded, "No." However, he said that they were spending more effort on domestic recruitment because they need more domestic students. They believed that this could be achieved through a rebranding campaign which is promoting them as a real university rather than a polytechnic. These interview results show that the student recruitment should include both domestic and international recruitment.

The Web site evaluation also shows that university Web sites tend to separate the information supporting the "recruiting international students" activity from general recruiting into a specific sub-site. For example, University F's Web site contains a sub-site called "International Students", which is specifically dedicated to supporting the activity of recruiting international students. This sub-site is dedicated to support information specifically for international students. This sub-site provides information about the background of University F, fees, courses, and the enrolment

process. One interviewee also believed that their Web site has more influence on international recruitment:

> *The Web environment is created because particularly for our international recruitment, the Web is the primary channel.*

Based on the results from both the interviews and the Web site evaluation, the "recruiting students" activity was divided into two activities, "recruiting domestic students" and "recruiting international students".

4.3.5 OCAs listed alphabetically

The last adjustment to the OCA Repository was that the OCAs listed in the OCA Repository have been arranged into alphabetical order. This allows the evaluators to search for the target activities more easily during the Web site evaluation.

4.4 Improvements made to the Web Site Evaluation Forms

A number of improvements were made to the Web Site Evaluation Forms in the Prototype OCAWSEM in the Developing Case Studies. In the end, the Developed OCAWSEM includes four forms. The following sub-sections will present the improvements made to each of them.

4.4.1 Web Site Evaluation Form 1

Web Site Evaluation Form 1 can be used by the evaluator to become familiar with the overall structure of the Web site through identifying what sub-sites are in the Internet, intranet or extranet domain. This helps the evaluator avoid confusion from browsing a large number of sub-sites within a university Web site. In addition, this form requires the evaluator to identify the users of the Web site. This information the evaluator uses to judge what OCAs the sub-site supports in the later stage of the Web site evaluation process. For example, the course information can be accessed from the "Prospective" sub-site which is in the Internet domain. Because the users are students, the sub-site supports the "recruiting international students" activity. If the course information can be accessed from Staff intranet, the users are staff. Thus, the sub-site supports the

"enhancing internal administrative efficiency" and "developing new courses" activities.

After the case studies, there were two instructions added into Web Site Evaluation Form 1. Firstly, if the sub-site only presents questions, this is not counted as one level of sub-sites. This research defines the sub-sites to be evaluated, as the third level from the University Homepage. A level of sub-sites is the Web page which is mixed with text, media, functions, and hyperlinks. However, a level of sub-sites sometimes presents questions only. For example, the Web site of University D has one level of sub-sites stating the questions which the users may ask. By clicking the questions, users will be referred to the next level of sub-sites which provide relevant information to answer the question. This level of sub-sites containing questions is not counted as one level in this research. However, if the sub-site contains hyperlinks only, it is still counted as one level of sub-sites.

Secondly, if the sub-site belongs to the domain of the university Web site, it must be partially or fully owned by the University. Most often, the ownership of the sub-site can be judged based on whether the sub-site has the same look and feel as the majority of sub-sites, contains the university crest, is developed by the university Web template, has a sub-Hyper Text Transfer Protocol (sub-HTTP) address under the university's main HTTP address or has a description clearly showing the ownership of the sub-site.

For example, University D provides a sub-site called "UniversityDbook" to provide book buying services to both University D and a polytechnic. This sub site also sells the memorabilia of University D. The name and the information and functions provided by the sub-site showing that University D owned this sub-site partly with Open Polytechnic. Thus, this sub-site is counted in the Web domain of University D in this research. In contrast, the Studylink Web site, which is fully owned by the government, the external Web site owned by travel agencies or the Weather Web site owned by other TV companies is not counted because the university does not own any part of the resources on the sub-site. These sub-sites are not counted in the domain of the university Web site, and are excluded from this research.

Thirdly, departmental sub-sites were evaluated in this research unless they supported any university level activity. This means that the sub-sites within the Web

domain of departments were not evaluated unless they are also shown to clearly support the university level activities.

4.4.2 Web Site Evaluation Form 2

Filling out Web Site Evaluation Form 2 required the most time because of the evaluation of a significant number of sub-sites. Several improvements were made to this form in order to reduce repetitive tasks, and produce a more reliable result in a more efficient manner. These improvements are described below.

Firstly, one instruction has been added into Web Site Evaluation Form 2, "delete repeated sub-sites in the same net domain, but keep the one with the shortest path". Sometimes, the sub-site that supports an OCA can be linked from the hyperlinks scattered throughout different Web pages either on the Internet, intranet, or extranet domain in the whole university Web site. For example, the hyperlink for linking the sub-site which supports the "providing student services" activity appears on the Web pages of different sub-sites in University F's Web site. These sub-sites include, for example, "myUniversity F Intranet", "Student Services", "IT services", and "Student News" sub-sites. Therefore, the result recorded in the Web Site Evaluation Form 2 would repeat this sub-site many times for supporting the OCA of "providing student services". When applying the new instruction, the sub-sites which support the same OCA and are linked from the hyperlinks on the same net domain are only counted as once in the Web Site Evaluation Form 2. This is because these records are all about the same sub-site. Thus, repetitive records were eliminated. Only the record showing the shortest path linking to the sub-site was kept.

The reason for keeping the record with the shortest path is because this provides more opportunities to analyse the Web site in more detail. For example, there are two paths to reach a sub-site; one needs one click from the Homepage, while the other needs three. When the first path is chosen, it is possible to evaluate every piece of information and hyperlink on the sub-site because this is the first level of sub-site. However, if three clicks have been taken to reach the sub-site, this means the sub-site is out of the range for evaluation in this research. Thus, it would not be possible to evaluate all information and hyperlinks of the sub-site.

A real world example can be found in one case study. To reach the Extramural sub-site requires three clicks if clicking the "Future Students" hyperlink on the

Homepage first, but only one click if clicking the "Extramural" hyperlink on the Homepage. Then, if the first path is chosen, it cannot click all the hyperlinks on the "Extramural" sub-site and follow the hyperlink to conduct further evaluations because it is the last page of the scope of the evaluation in this research. It can only count the "Extramural" sub-site as a sub-site that supports a particular OCA. If the second path is chosen, evaluation of all the content of this sub-site would be required, including the hyperlinks on the sub-sites, and the lower levels of sub-sites linked by these hyperlinks located on the sub-site.

This instruction was applied to the sections on the Web page which present only parts of the information contained in another sub-sites. For example, the "Notice Board" section provides documents or titles that dynamically link to part of the content of the "News and Event" sub-site. If these sections are on the same net domain with the "News and Event" sub-site, they are still considered as a repetitive result to the "News and Event" sub-site.

Secondly, the column "Title of the Sub-site" in Evaluation Form 2 was replaced as "Title of the Sub-site and How It Was Found". This shows that the evaluator is required to record how the sub-site is reached by recording the hyperlinks which have been clicked. The records made from this column help the evaluator justify which record should be kept and which should be eliminated when the instruction "delete repeated sub-sites in the same net domain, but keep the one with the shortest path" is applied. In addition, this column records the information which is helpful for the evaluator to revisit the sub-site efficiently if needed.

Thirdly, an instruction was added, "the name of the sub-site should be recorded from the content rather than the top left corner of the screen". This instruction requires the evaluator to record the name of the sub-site identified from the content of the sub-site rather than from the top left corner of the screen when filling out Evaluation Form 2. Ideally, the name of the sub-site which appears in the sub-site's content should be the same as the name which appears on the top left corner of the screen showing the sub-site. However, the name which appears in these two places can be different in some cases. To avoid confusion, the instruction specifies that the evaluator record the name of the sub-site identified from the sub-site's content only when filling out Web Site Evaluation Form 2. Only if the name of the sub-site cannot be identified from the content, the name appearing on the top left corner of the

screen showing the sub-site will then be recorded. By following this instruction, the records become more consistent.

Fourthly, another instruction was added, "if a sub-site contains a lower level of sub-sites, which support the same sub-activity enabling the OCA, these lower levels of sub-sites are not recorded". The reason is that this research evaluates how effective the Web site is in supporting the OCA based on how many different kinds of support the sub-sites provide. Some sub-sites may contain a significant number of sub-sites under the lower level, such as course information which includes many sub-sites. However, it only provides one aspect of support to the OCA, which is providing course information. These lower levels of sub-sites will not be counted and recorded as sub-sites which support the OCA. In other words, it is important to consider not only "Does it provide support?", but also "Does it provide different support?" to the OCA when evaluating the lower level of sub-sites which are under a particular sub-site.

Fifthly, another instruction was added, "count those sub-sites which provide support to the organisational critical activity directly". This means that this research counts only those sub-sites which support the OCA directly. An OCA is sometimes enabled by various activities. For example, the "developing new courses" activity can be supported by other activities, such as providing library services, conducting research activities, and recruiting new lecturers. A sub-site may not provide any support to the "developing new courses" activity directly, yet provide much support to these activities which support the "developing new courses" activity. This can be considered as providing indirect support. In this research, this sub-site was not recorded as supporting the "developing new courses" in the Web Site Evaluation Form 2 because it provided indirect support.

Another example can be found when judging whether the "Recruitment" sub-site supports the "developing research" activity. The "Recruitment" sub-site can support the "developing research" activity indirectly because the university can recruit more renowned researchers through the assistance of this sub-site, and then increase its research capability. Because this is an indirect support, this research does not record the "Recruitment" sub-site as supporting the developing research.

Sixthly, the last instruction which was added is "the sub-site, which contains only hyperlinks without any extra information, will not be recorded. For example,

Sub-site A contains a hyperlink which links to Sub-site B, and Sub-site B provides support to a particular OCA. If Sub-site A contains some relevant information as well, it is counted as one sub-site to support the OCA. If Sub-site A only contains the hyperlink, it is not counted as one sub-site. However, Sub-site A is still counted as one level of sub-site".

Lastly, one column, "Specific Features", was added into Form 2 for noting down the sophisticated features which are ranked with higher interactivity. After the completion of Web Site Evaluation Form 2, the evaluator then needs to complete Web Site Evaluation Forms 3. Then, the evaluator will be very likely to revisit the sub-site and identify these sophisticated features in order to judge the level of the interactivity of the sub-site. Because the Web site of a university could comprise several hundreds of sub-sites, this revisiting process requires a significant amount of time. Most importantly, this seems to be a repetitive task in terms of clicking the same hyperlinks and reaching the same sub-sites. To simplify the process, the solution is to note down any sophisticated feature into the new column while utilising Web Site Evaluation Form 2 in the evaluation process. The sophisticated features are those which are specific and can be possibly ranked as higher level of interactivity in Web Site Evaluation Form 3, such as search feature provided, real time communication, or online form. Therefore, the evaluator can complete Web Site Evaluation Form 3 more efficiently.

4.4.3 Web Site Evaluation Form 3

Web Site Evaluation Form 3 summarises and interprets the results produced from Web Site Evaluation Form 2 in a meaningful manner in terms of how effectively and efficiently the Web sites support the OCAs. Several improvements were made to Web Site Evaluation Form 3 in order to enhance its usability, validity, and reliability.

In terms of improving its usability, Web Site Evaluation Form 3 was divided into two forms, Web Site Evaluation Form 3A, and Web Site Evaluation Form 3B. Web Site Evaluation Form 3A is utilised for recording how effectively and efficiently the Web sites support the OCAs, while Web Site Evaluation Form 3B is utilised for the reference of utilising the two evaluation criteria – informativeness and interactivity – to evaluate the support. In the beginning of the case studies, these two forms were integrated and termed Web Site Evaluation Form 3. Separating Web Site

Evaluation Form 3 into two helps the reading of the description of the criteria become easier, and improves the usability of the form.

In addition, more common examples of the features which are ranked as level 3 of interactivity are added to Web Site Evaluation Form 3. The level 3 of interactivity includes the features which support the data transaction between users and the university in the Web environment. There was only one example provided in the beginning of the case studies, which was the search function. During the case studies, more sophisticated features supporting data transaction were found. Most commonly, these features include the online payment feature (for example, credit card payment), change of passwords, and exchange of personal information. These features enable a two way communication in the Web environment. Thus, these features are added into the description of the third level of efficiency criterion.

In terms of improving the validity, the criterion "consistency" was added into Web Site Evaluation Form 3B for the purpose of evaluating branding. This is because the two criteria, which are informativeness and interactivity, are not sufficient to evaluate how university branding is supported by Web sites. As one interviewee described, branding in a university involves communicating the press outlook of the university in the public channels:

> *The brand, actually everything from we change the colour, the brochures, things like that and the key message that we are trying to put out to the public about the university, that I tied it with that brand.*

Among various channels, Web sites play a crucial role of providing a press view of the universities. To enhance the branding of universities virtually, they expect that Web sites have the same look and feel as their printed material. For example, one interviewee specified that they are upgrading the colour and look and feel of their Web site to reflect their new brand advertised in the newspaper:

> *And we are pushing a new brand right across the university. So, the Web site has been seen as a very important medium for that … the new brand, and it's a graphical interpretation, key parts of our new Web site…I mean the branding, if you probably look around the newspaper, you will see University A's new brand. It has a new logo, and we are going to*

> *reflect this on the new Web site, look and feel, colours, but particular telling the stories from the front page…*

A consistent Web design with the university brand will enable the users to feel familiar with the universities, and thus increases the brand of the universities. In other words, the evaluation of how Web sites support branding depends on evaluating the look and feel of the Web site in terms of how similar it is to the printed material. Therefore, it is necessary to utilise criterion consistency for evaluating how the Web site supports the "increasing the branding" activity. The concern is whether the design of the Web pages is consistent with the university's publications. This research evaluates the consistency of the Web design with the university's publications in terms of logo and colour. There are three levels of consistency defined in this research. They are shown in Table 4.9.

Table 4.9 *The levels of consistency*

Levels	Descriptions
High	No more than two sub-sites are designed inconsistently
Medium	More than half of the sub-sites are designed consistently
Low	More than half of the sub-sites are designed inconsistently

Web Site Evaluation Form 3B contains the description of how the three evaluation criteria can be applied. However, this does not mean that the consistency of Web design is the only criterion for evaluating the branding. Some of the university Web sites also contain sub-sites to support branding activity. For example, University G provides a sub-site to support branding activity, which is called "University G Branding". This sub-site provides both information and features to support the university's branding. The original criteria (informativeness and interactivity) are still applicable in this circumstance. Thus, all of the three criteria contained in the Web Site Evaluation Form 3B are required for evaluating the "increasing the branding" activity.

In order to enhance the reliability, one instruction was added to define the meaning of the term "search feature" in the Web Site Evaluation Form 3B. This instruction is "the search feature is the feature which supports the OCA rather than the general search feature of the Web site". It is very common that university Web sites

contain a powerful search engine to assist users to find particular information in the whole Web site efficiently. If a sub-site also provides this kind of search engine, it does not mean this sub-site provides the third level of interactivity to any OCA except the "enhancing internal administrative efficiency" activity. This is because this kind of search engine only helps the users locate specific information from the whole Web site more easily, yet it does not support any specific OCA except "enhancing internal administrative efficiency" activity. A good example for supporting an OCA is the search feature for course catalogues. This is a search feature specifically designed for users to find course information.

4.4.4 Web Site Evaluation Form 4

There were only two improvements made to Web Site Evaluation Form 4. One was on the descriptions of Categories 1, 2, 3, and 4. Originally, the descriptions stated "…in the Web Site Evaluation Form 3". Because Web Site Evaluation Form 3 has been divided into Web Site Evaluation Forms 3A and 3B, the descriptions have been changed to "…in the Web Site Evaluation Form 3A" in order to coordinate with the improvement made to Web Site Evaluation Form 3.

The other improvement is an instruction which was added to Web Site Evaluation Form 4. This instruction requires the evaluator to record the activities in each level of categories alphabetically. Listing activities alphabetically in Web Site Evaluation Form 4 enables evaluators to analyse the result efficiently.

4.5 Improvements made on the Prioritising Principles

There were two types of prioritising principles developed in this research. One is used to prioritise the lists of OCAs which were nominated by the interviewees. This is termed "Interview Prioritising Principle". The other is used to prioritise the OCAs extracted from the Web site evaluation. This is termed "Web Prioritising Principle". The following sub-sections will discuss the improvements made to both of these two types of prioritising principles from the case studies in the OCAWSEM Developing Process.

4.5.1 Interview Prioritising Principles

The Interview Prioritising Principles provide a systematic and reasonable way to prioritise the different lists of OCAs which were nominated by the interviewees. Although most of the interviewees gave lists of OCAs, these lists of OCAs were diversified in terms of content and priorities of the activities in the lists. Several improvements were added to assist prioritising the lists of OCAs.

Firstly, eight Interview Scoring Principles and the correspondent scores for each principle have been developed and utilised to help prioritising the interview results. These principles are to complement the Interview Prioritising Principles, not to replace them. The purposes of these principles are to make the difference between OCAs becoming large, and distinguish the OCAs into several categories based on the score each OCA is assigned. The descriptions of these principles and scores were particularly listed in a table for the purpose of ease of reading. This table and the Interview Scoring Principles and Scores are shown in Table 4.10.

Table 4.10 *The Interview Scoring Principles and Scores*

No	Interview Scoring Principles	Scores
1A	The activity contributes to the success of **university level** and is revealed by one interviewee **explicitly**.	20
1B	The activity contributes to the success of **university level** and is revealed by one interviewee **implicitly**.	15
1C	The activity contributes to the **functional level** success and is revealed by one interviewee **explicitly**.	15
1D	The activity contributes to the **functional level** success and is revealed by one interviewee **implicitly**.	10
2A	The activity supports **part** of an OCA and is revealed **explicitly**.	10
2B	The activity supports **part** of an OCA and is revealed **implicitly**.	5
2C	The activity is a **functional** activity, supports **part** of an OCA, and is revealed **explicitly**.	5
2D	The activity is a **functional** activity, supports **part** of an OCA, and is revealed **implicitly**.	2

It is important to realise that assigning the scores to the Interview Scoring Principles is hermeneutic in this research. The number itself does not represent an actual measure on how important the OCA is to the success of the university. In addition,

neither does the difference between any two scores represent the actual importance of these two activities to the university's success. In other words, the gap between the scores of two principles does not represent the gap between the actual contributions which these two activities have made to the university's success. The Interview Scoring Principles only make the difference between OCAs becoming large, and assigning the OCAs into several categories in order to increase the efficiency of the prioritising process.

These principles are to complement the Interview Prioritising Principles, not to replace them. Since the views on the OCAs are varied across the management in all cases, the Interview Scoring Principles were particularly helpful for prioritising longer lists of OCAs. Applying them is the step before applying the Interview Prioritising Principles as Interview Scoring Principles can assign the results of OCAs into several categories according to the scores given to each of the OCAs. Thus, the prioritising process becomes easier. The key words in these principles are bolded for the purpose of ease of reading.

Secondly, in total six new Interview Prioritising Principles have been added into the Prototype OCAWSEM. After applying the Interview Scoring Principles, some of the OCAs can be prioritised easily if they are scored differently than others (e.g. much higher or lower than others). However, if two or more than two OCAs have the same scores, it is necessary to utilise any effective prioritising principle to prioritise them. The only Interview Prioritising Principle contained in the Prototype OCAWSEM is "the activity as nominated by more interviewees is more critical". However, this principle was insufficient for prioritising two or more than two OCAs which had the same score and were nominated by the same number of interviewees. For example, the "developing research" and "recruiting international students" activities both scored 80 and were nominated by three interviewees. In this case, the six new Interview Prioritising Principles could be applied to prioritise these two OCAs.

Together with the original principle, there are seven Interview Prioritising Principles provided in the Developed OCAWSEM, They are shown in Table 4.11 (see next page). The key words in each of them are bolded as well.

Table 4.11 *The Improved Interview Prioritising Principles*

No	Prioritising Principles
1	The activity nominated by **more interviewees** is more critical.
2	The activity revealed by the interviewee who is a **senior management member** is more critical.
3	The activity which contributes to the **success of university level** is more critical **than** the **functional level** activity mentioned by the interviewee who is responsible for it.
4	The activity nominated **explicitly** is more critical than the one nominated **implicitly**.
5	The activity **prioritised higher** by the interviewees is more critical.
6	The activity **urgently needed** for the university is more critical.
7	The activity which provides **more contribution** to the **university's success** is more critical.

In regard to the first principle, since this research adopted the case study methodology to elicit OCAs, the OCA which is nominated by more interviewees means more triangulation has been made. Thus, this OCA is more critical and should be prioritised higher than others. In regard to the second principle, the OCAs are the organisational priorities and have been monitored by senior management team. Thus, if two or more OCAs are rated the same scores, the one which is nominated by the senior management member is prioritised higher. The definition of OCAs also shows that the activity should contribute to university level success. The third principle is thus developed. The sixth principle is also based on the same aspect of the definition. The activity, which provides more contribution to the university's success, is more critical.

In terms of the fourth, fifth, and sixth principles, their development was based on the findings of this research. The Explicit OCA is nominated by the interviewee after he or she has received the definition of OCAs and is asked to nominate a list of them. In contrast, the Implicit OCA is revealed by the interviewee in the other parts of the conversation. Thus, as shown in the fourth principle, the explicit OCA is prioritised higher. The fifth principle shows that the priority of the OCAs given by interviewees is a concern in this research. If the interviewee prioritises one of two activities as higher, it is prioritised in that way. The sixth principle is based on how important the OCA is in dealing with the current problems of the university. As will be discussed later in Chapter 6, the environmental factors are critical to what OCAs universities should be conducting and how these activities are prioritised. Those urgent ones have received more attentions from the management. Thus, they are prioritised higher.

These principles are applied according to the order shown in Table 4.11. This order has been developed and confirmed in the eight case studies. Basically, the rationale of setting the priority on these principles is the degree of subjective judgement involved from the interviewer in deciding which OCAs should be prioritised higher than the others. The principle applied earlier has less degree of subjective judgement while the later has more. For example, it is easy and without any subjective judgement to identify the interviewee who is a senior management member (see Principle 2) while judging whether the activity can provide more contribution to the university's success. In addition, setting the order of applying these principles also considers how reliable the OCA which is nominated by the interviewee is. For example, the activity nominated by more interviewees should be more reliable than, perhaps, just nominated by one senior management member. Thus, the first principle should be applied earlier than the second principle.

4.5.2 Web Prioritising Principles

The Web Prioritising Principles help translate the records listed in the Web Site Evaluation Form 4 into a list of OCAs supported by the Web site. As Web Site Evaluation Form 4 has already assigned the OCAs supported by the Web site into five categories, the Web Prioritising Principles are to further prioritise the OCAs in each category and then compare the prioritisation of OCAs across all the categories. In Table 4.12 are the four principles listed in the Developed OCAWSEM. They are.

Table 4.12 *The Improved Web Prioritising Principles*

No	Web Prioritising Principles
1	The organisational critical activity in **higher category** has higher priority than the one in the lower category.
2	The activity, which is supported by **more sub-sites**, has higher priority.
3	If two or more than two organisational critical activities are supported by the same number of sub-sites and ranked in the same levels of Interactivity, the one supported by **more sophisticated Web features** will have higher priority.
4	If two or more than two organisational critical activities are supported exactly by the same sub-sites, the one supported by **more information** will have higher priority.

The first and second principles were contained in the Prototype OCAWSEM. There were two new principles added in the step of prioritising the Web site evaluation

result in the Developing Case Studies. One is "If two or more than two OCAs are supported by the same number of sub-sites and ranked in the same levels of interactivity, the one supported by more sophisticated Web features will have higher priority". The other is "If two or more than two OCAs are supported totally by the same sub-sites, the one supported by more information will have higher priority". For example, OCA 1 and 2 are both only supported by Sub-site A. When prioritising how well these two are supported by the Web site, it is necessary to assess the content of Sub-site A in order to identify which activity can be supported more by the content of the information in the sub-site.

Similarly to the Interview Prioritising Principles, the Web Prioritising Principles also have a priority for their application. The numbers shown in Table 4.12 show the order of application. The second and third principles represent different focuses on the Web site evaluation criteria – informativeness and interactivity, respectively. Applying the second earlier than the third means that the criterion informativeness is more important than the criterion interactivity in terms of how well the Web site supports OCAs. It is important to clarify here that information plays a more critical role than interaction. The Web site or sub-site with a higher level of interactivity denotes that it can transmit information more efficiently. The fundamental function of Web site, in terms of supporting OCAs, is still the provision of information. Thus, this research ranks the importance of informativeness higher than that of interactivity.

4.6 Improvements to the Evaluation Process Instructions

Four kinds of improvements were made to Evaluation Process Instructions of the Prototype OCAWSEM. Firstly, a set of Interview Normalisation Principles were developed and added into the Prioritising OCAs stage (see Table 4.13 on next page). In total, there are six Interview Normalisation Principles. These principles should be conducted before the scoring and prioritising of the lists of OCAs. The numbers shown in Table 4.13 are the order for their application.

Table 4.13 *Interview Normalisation Principles*

No	Interview Normalisation Principles
1	**Check the terms** nominated by interviewees with the terms provided in the OCA Repository and the definition of organisational critical activities.
2	**Delete** the activity which is not an organisational critical activity.
3	**Add** the activity which is an organisational critical activity and not provided in the OCA Repository.
4	**Divide** the activity which can be divided into two or more organisational critical activities.
5	Write **"F"** beside the activity which is **functional** organisational critical activity.
6	Write **"P"** beside the activity which is **part** of an organisational critical activity.

As discussed in Section 4.1.1, the major purpose of developing these principles are to normalise, categorise, and validate the diversified terms nominated by interviewees in order to assist the following scoring and prioritising tasks. Most often, interviewees used different terms to name the same OCAs. It would then be problematic to score, prioritise, and create a final list of OCAs. Thus, this research will normalise the original lists of OCAs, which were nominated by the interviewees, based on the OCA Repository and the definition of OCAs before the scoring and prioritising task. This is the purpose of developing the first principle.

The second principle is used to delete an OCA which is not listed in the OCA Repository and is not evaluated as an OCA. However, if an OCA which was not yet listed in the OCA Repository, was evaluated as an OCA. It was added into the OCA Repository. In addition, any OCA which could be divided into two or more OCAs was divided. The third and fourth principles were developed to achieve these purposes.

The fifth and sixth principles are used to identify functional critical activities and the activity which supports an OCA. The analyser is required to note down "F" beside the functional critical activity and "P" beside the activity which supports an OCA. Making these notes can increase the efficiency of scoring and prioritising OCAs in the next step.

This research defines the functional critical activity as the activity which is recognised by the interviewee as an OCA, is a functional activity, and is exclusively nominated by the interviewee. For example, one interviewee nominated the "provision of enrolment information" activity as an OCA:

> *I would say one of the most important is actually student administration and that deals with everything from enrolment through to monitoring*

progress, marks recording and the rest of them, how you communicate with that information.

It is still possible that this activity is an OCA to the university. However, this activity was not nominated explicitly by any other interviewee as an OCA. In addition, the provision of information is a critical function of the IT Department. This evidence shows that this activity is a functional critical activity rather than an OCA to the university.

It is important to note here that the normalisation of OCAs should not only concern the term, but also the meaning revealed by the interviewee behind the term. In other words, the interviewer should elicit the meaning behind the term during the interview in order to help the normalisation. For example, both interviewees A and B stated that providing quality teaching is an OCA. During the rest of interview, interviewee A did not emphasise the quality aspect; for example, how they increase the quality of the teaching. In contrast, interviewee B discussed both how they deliver the teaching and how they enhance the quality of the teaching. Thus, the term used by interviewee A can be normalised as the "efficient teaching and learning" activity only, while the term used by interviewee B can be divided into both "efficient teaching and learning", and "assuring teaching quality" activities.

Secondly, in order to avoid confusion and evaluate the Web site systematically, the evaluation process on any Homepage or sub-site has been set up as starting from the centre of the Web page which is the main content of the sub-site, to the quick links on top, on the side, and finally to the quick links on the bottom. The Evaluation Process Instructions of Steps 1 and 5 in Stage 5 were changed accordingly.

Thirdly, one instruction was added into Step 2 of Stage 5 to require the evaluator to analyse the purposes of the hyperlink and the sub-site. It is important to check the purposes of the hyperlink and the sub-site in order to assist identifying what OCAs the Web site supports. Sometimes, the result obtained from Web Site Evaluation Form 1 can be revisited. This is an example to illustrate why it is important to check the purpose of the hyperlink. A hyperlink, which refers to the sub-site of "Students and Learning", is found on the Web page of "Current Students". This shows the intended user of this hyperlink is the current student. Thus, the purpose of the sub-site of "Students and Learning" is recognised as providing teaching and

learning support. However, if the hyperlink is located on the Staff Homepage which is an intranet sub-site, the intended user is the staff. Therefore, the purpose of the sub-site is recognised as providing support to enhance the internal administrative efficiency.

However, to identify the purpose of the sub-site is not an easy task. For example, the "Courses and Subjects" sub-site can apparently be used for either advertising or student learning support. There is also a possibility that some lecturers will access course information through this sub-site, to help them develop new courses. Therefore, the sub-site can support the "developing new courses" activity as well. Furthermore, it is also possible that prospective lecturers check information in this sub-site and then decide whether they will be able to teach in this university. If this occurs, the sub-site also supports the activity of "recruiting staff". These examples show that if the sub-site is accessed through the Internet, it is possible that every kind of user can get access to this sub-site. The judgment of what activities the sub-site supports therefore is problematic because it is still unknown whether all kinds of users will get access to the sub-site.

To deal with this difficulty, it is important to identify the purpose of the sub-site from the content of the sub-site. This is because this research adopts the organisational provider's viewpoint to evaluate the Web site. Thus, the organisational provider's purpose and intention to develop the sub-site should be considered rather than how the user perceives it. In other words, the crucial matter is "what it is for" rather than "what it can do". Hence, identifying the purpose of a sub-site from its content is crucial in order to judge what OCAs the sub-site supports.

Fourthly, two instructions were added into Stage 6 of the Evaluation Process Instructions. They are "record the result into Web Site Evaluation Form 3A" and "repeat step 1 to 3 on the rest of organisational critical activities in Web Site Evaluation Form 3A". As described previously, how to find the sub-site and sophisticated features are recorded in the Web Site Evaluation Form 2 in the later cases. Therefore, it becomes more efficient for the evaluator to fill out Web Site Evaluation Form 3A if these records are accessed. The evaluator can find the target sub-site for the evaluation quickly by following the information recorded in the Web Site Evaluation Form 2. In addition, the evaluator can identify the sophisticated features easily for supporting a particular OCA, and judge the level of interactivity

efficiently. Thus, these two instructions were added into Stage 6 of the Evaluation Process Instructions.

4.7 Chapter Summary

This chapter is the first chapter presenting the results in this thesis. It has presented the improvements which were made to the components of the Prototype OCAWSEM in the Developing Case Studies. These components include the Interview Guide, OCA Repository, Web Site Evaluation Forms, Prioritising Principles, and Evaluation Process Instructions. In regard to the Interview Guide, the definition of OCAs has been improved to an easy-to-understand format. Some of the interview questions have been improved or abandoned. New useful questions both formal and interactive were added. In regard to the OCA Repository, some of the activities in the repository were renamed, merged with other activities, divided into more activities, and alphabetically listed. In regard to the Web Site Evaluation Forms, all forms were improved in order to provide a more systematic evaluation process on the Web site in an efficient manner. In regard to various kinds of prioritising principles, new principles were added to help generate two lists of OCAs both from the semi-structured interviews and the manual Web site evaluation. In regard to the Evaluation Process Instructions in the Prototype OCAWSEM, improvements were also made. After these improvements, the improved Prototype OCAWSEM is termed Developed OCAWSEM.

CHAPTER 5

RESULTS PART II:

TESTING THE DEVELOPED OCAWSEM

This is the second chapter presenting the research results in this thesis. After the Developing Case Studies, the Prototype OCAWSEM was improved to become the Developed OCAWSEM. This chapter will present the results of testing the Developed OCAWSEM in the Testing Case Study, the eighth case study. Section 5.1 will present the results of the support made to each of the OCAs listed in the Developed OCAWSEM, and also discuss the overall support made to the OCAs. Section 5.2 will discuss what criteria can be used to assess the quality of the Developed OCAWSEM,

and how the quality was tested against criteria. The last section, Section 5.3, is a summary of this chapter.

5.1 Results of the Testing Case Study

In Stage 1 of the OCAWSEM, seven interviewees in various levels of management in the Testing Case were interviewed: a Vice-Chancellor, Former Vice-Chancellor, Deputy Vice-Chancellor, Director of Marketing, Director of Information Technology Services, Project Manager of Information Technology Services, and Internet Service Manager. Three of the seven interviewees are the members of the senior team: the Former Vice-Chancellor, Vice-Chancellor, and Deputy Vice-Chancellor. Stage 2 then requires all interviews to be transcribed and analysed through the NVivo computer software and thematic analysis, and seven lists of OCAs were generated.

Stage 3 comprises two steps which are normalisation and prioritisation. In the normalisation step, the Interview Normalisation Principles were applied. The terms mentioned by interviewees both explicitly and implicitly were confirmed with the definition of OCAs, and then were normalised by the terms listed in the OCA Repository. Three terms nominated by one of the senior management members, which were not OCAs, were deleted. Although they were nominated as OCAs, the other interviewees further explained that these three were attributes of the university rather than activities. In addition, these three terms appear to be the outcomes of conducting certain activities rather the activities themselves.

Two interviewees mentioned human resource management as an OCA. According to the meanings given by the interviewees, human resource management is to lay off employees, recruit new staff, and promote current staff. Thus, this activity is divided into three OCAs in the OCA Repository – “enhancing internal administrative efficiency”, “recruiting staff” and “retaining staff”. Four interviewees nominated recruiting students as an OCA. However, they did not specify whether the recruitment focused on domestic or international markets. Thus, the recruitment activity was divided into two OCAs – “recruiting domestic students” and “recruiting international students”.

Three nominated activities were part of the OCAs. A letter “F” was marked beside these three activities. The first is the commercialisation of intellectual property.

This activity means that the university conducts some practical research, produces tangible or intangible outputs and then sells these outputs for profit. These activities were categorised into the "developing research" activity because the term "developing research" has a broader meaning which includes conducting research, generating profits from the research outputs, and sustaining the research funding. The second and third are "building excellent buildings" and "providing quality facilities, campus, and equipment". These two activities are part of the "facility management" activity. The lists of Explicit and Implicit OCAs after the normalisation process are shown in Tables 5.1 and 5.2 (see next page).

Table 5.1 *Normalised Explicit OCAs in the Testing Case Study*

Interviewees	Normalised Explicit OCAs and the Priorities
A	1. Enhancing internal administrative efficiency, recruiting staff, and retaining staff; 2. Providing and developing strategic plans; 3. Facility management
B	1. Efficient teaching and learning; 2. Developing research; 3. Commercialisation of intellectual property (P)
C	-
D	1. Efficient teaching and learning; 2. Developing research; 3. Recruiting domestic students and recruiting international students; 4. Enhancing internal administrative efficiency, recruiting staff and retaining staff; 5. Facility management; 6. Communication with businesses and local community; 7. Financial management
E	1. Recruiting domestic students and recruiting international students; 2. Developing research; 3. Financial management
F	1. Recruiting domestic students and recruiting international students; 2. Financial management; 3. Efficient teaching and learning
G	1. Developing research; 2. Efficient teaching and learning; 3. Recruiting domestic students and recruiting international students; 4. Financial management; 5. Building excellent buildings (P)

Table 5.2 *Normalised Implicit OCAs in the Testing Case Study*

Interviewees	Normalised Implicit OCAs
A	Financial management; Efficient teaching and learning; Providing student services; Providing student learning supports; Developing research; Efficient teaching and learning
B	Recruiting staff; Providing quality facilities, campus, and equipment (P)
C	Developing research; Efficient teaching and learning
D	Developing new courses

When conducting the prioritising step in Stage 3, those normalised OCAs were firstly scored according to the Interview Scoring Principles. Then, they were prioritised based on the Interview Prioritising Principles. There are 14 OCAs produced in the final list representing the view from the management on what OCAs the university is conducting. They are shown in Table 5.3.

Table 5.3 *Prioritised OCAs in the Testing Case Study*

Priority	OCAs	Total Scores	Principles Applied
1	Efficient teaching and learning	125	-
2	Developing research	120	-
3	Financial management	95	-
4	Recruiting domestic students	80	-
5	Recruiting international students	80	-
6	Facility management	55	1
7	Recruiting staff	55	-
8	Retaining staff	40	6
9	Enhancing internal administrative efficiency	40	-
10	Providing and developing strategic plans	20	2
11	Communication with businesses and local community	20	-
12	Providing student services	15	2, 6
13	Student learning support	15	2
14	Developing new courses	15	-

The sixth and seventh OCAs share the same scores. The first Interview Prioritising Principle is applied to prioritise the "facility management" activity higher as this activity has been nominated explicitly and implicitly by four interviewees with the other only by three. The eighth and ninth also share the same scores, and the sixth Interview Prioritising Principle is applied. The reason is that the "retaining staff" activity was urgently needed for the university at the point where the interviews were

conducted. As the interviewees noted, this university recently had suffered difficulties in retaining experienced academic staff members from losing them, particularly to a newly established university providing attractive remunerations. Thus, the "retaining staff" activity was urgently needed for the university. The tenth and eleventh are also scored the same, and the second principle was applied. The "providing and developing strategic plans" activity was nominated by a senior management member while the other was not nominated by any senior member.

In order to prioritise the twelfth, thirteenth and fourteenth activities, the second and sixth Interview Prioritising Principles are applied. Two of them, "providing student services" and "providing student learning supports", were nominated by the senior management members. The "providing student services" was prioritised higher because it was currently urgently needed for the university. According to the interviews, this university loses its student market at the moment to a strongest competitor which is a university in another city providing an attractive campus environment and student life style. Thus, this university has to provide better student services to retain current students and attract prospective students. Thus, the "providing student services" was prioritised higher.

After conducting Stages 4, 5, 6, and 7, all the Web Site Evaluation Forms were complete. There are 25 OCAs supported by the Web site while eight are not. They have been grouped into five categories in terms of the levels of effectiveness and efficiency. Category 1, which is "Effectively and Efficiently Supported", has the most number of OCAs. Table 5.4 (see next page) shows the OCAs which were nominated by the interviewees and the categories they belong to in the Web Site Evaluation Form 4.

In Table 5.4 (see next page), all of the OCAs in the same category have been sorted by applying the Web Prioritising Principle 1 – "the activity, which is supported by more sub-sites, has higher priority", except the "facility management" and "recruiting domestic students". These two activities are supported by the same number of sub-sites and ranked in the same level of interactivity – level 3. Thus, the Web Prioritising Principle 3 is applied. It was found that the university provides a more sophisticated search function, which can help users search much more topics, to support the "recruiting domestic students" activity. This activity is prioritised higher

than the "facility management" activity. The results of this prioritising process produce a list of OCAs supported by the Web site, which is shown in Table 5.5.

Table 5.4 *Grouping the OCAs nominated by the interviewees in the Web Site Evaluation Form 4*

Category	OCAs Nominated by the Interviewees (in no particular order)
Category 1: Effectively and Efficiently Supported	Communication with businesses and local community; Enhancing internal administrative efficiency; Providing student services; Recruiting international students; Developing research; Retaining staff; Student learning support
Category 2: Effectively or Efficiently Supported	Facility management; Recruiting domestic students
Category 3: Generally Supported	Efficient teaching and learning; Recruiting staff
Category 4: Poorly Supported	Developing and providing strategic plans; Financial management
Category 5: Non-supported	Developing new courses

Table 5.5 *Prioritised OCAs both nominated and supported*

Priority	OCAs
1	Providing student services
2	Enhancing internal administrative efficiency
3	Retaining staff
4	Providing student learning supports
5	Communication with businesses and local community
6	Recruiting international students
7	Developing research
8	Recruiting domestic students
9	Facility management
10	Recruiting staff
11	Efficient teaching and learning
12	Developing and providing strategic plans
13	Financial management
14	Developing new courses

Stage 9 discusses the overall support given to the nominated OCAs by the Web site. The meaning of the overall support discussed in this research comprises two aspects: one is whether the priority given by the management is reflected on the Web site; and the other is how effectively and efficiently the OCAs are supported. In other words, if the university's Web site fully supports the OCAs, two conditions must be established.

Firstly, the priority of the OCAs nominated by management is the same as the priority of the OCAs indicated on the Web site. Secondly, the support the Web provides to the OCAs nominated by management should be higher than to other non-OCAs in terms of effectiveness and efficiency.

These two conditions show that an overall support discussion merely based on the consideration of priority is not enough, but also needs to consider how effectively and efficiently the Web site supports the OCAs. For example, there are two OCAs, OCA A and OCA B. They are the first and second priorities respectively in the management's OCA list. Both are supported by two university sub-sites called Sub-sites A and B. Then, the list of supported OCAs produced from the Web site evaluation results also shows that OCAs A and B are the first and second priorities respectively. In this case, the OCA A and OCA B in the two lists have the same priority. The first condition – priority – is fulfilled. If, however, the Sub-site A gives strong support to two activities that places these two activities into Category 1 in the Web Site Evaluation Form 4 (Effectively and Efficiently Supported). In contrast, the Sub-site B gives poor support to them that places these two activities into Category 4 (Poorly Supported). Thus, the Sub-site A is fully supporting the two OCAs while the Sub-site B is not.

When the first condition is considered by this research, a comparison between the two lists of OCAs, which are the OCAs nominated from the interviewees and supported by the Web site, is shown in Table 5.6 (see next page).

As shown in the Difference column in Table 5.6, the positive number means that the priority of the support made to this OCA from the Web site is higher than the priority given by the management to this OCA in their OCA list. The negative number means that the priority on the Web site in supporting this OCA is not as high as the management expected. Regardless of whether it is positive or negative, the larger the number of the OCA, the more attention should be paid to improving the Web design to support that OCA.

Table 5.6 *Comparison between nominated and supported OCAs*

Organisational Critical Activity	Priority viewed by management (A)	Priority indicated by the Web site (B)	Difference (A – B)
Efficient teaching and learning	1	11	-10
Developing research	2	7	-5
Financial management	3	13	-10
Recruiting domestic students	4	8	-4
Recruiting international students	5	6	-1
Facility management	6	9	-3
Recruiting staff	7	10	-3
Retaining staff	8	3	+5
Enhancing internal administrative efficiency	9	2	+7
Providing and developing strategic plans	10	12	-2
Communication with businesses and local community	11	5	+6
Providing student services	12	1	+11
Student learning support	13	4	+9
Developing new courses	14	Not supported	Not applicable

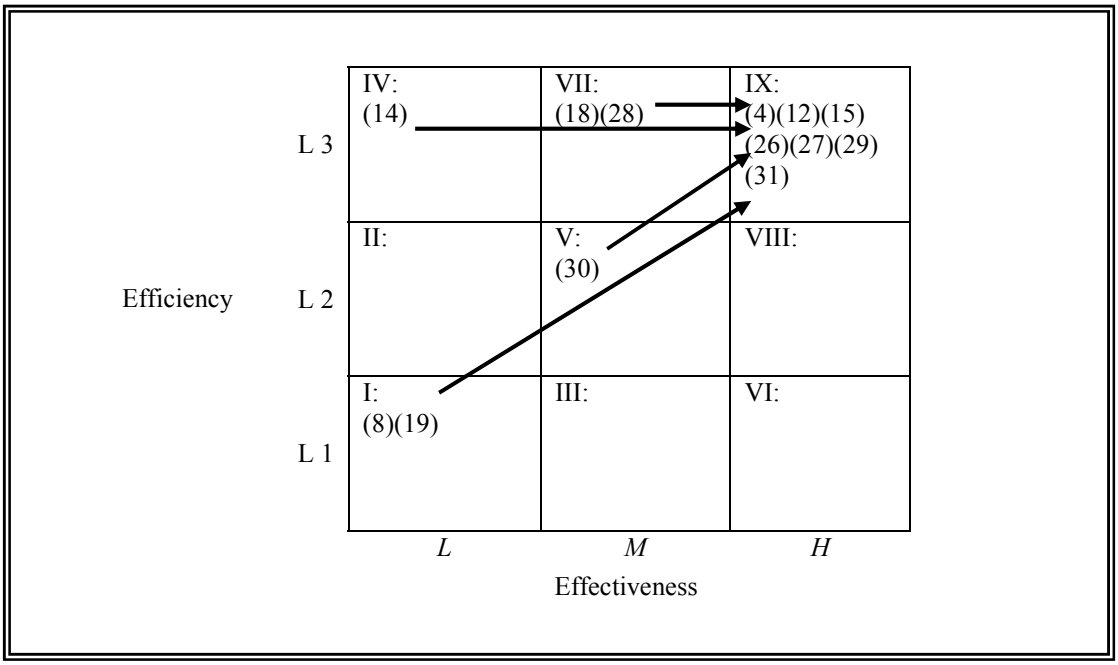
According to Table 5.6, the Web site provides most support to the "providing student services" and "enhancing operational efficiency" activities while the management nominated the "efficient teaching and learning" and "developing research" activities as the top two priorities. The "providing student services" activity receives the largest number in the "Difference" column. This is where the poorest support occurs. Moreover, the Web team needs to pay more attention to those OCAs which received negative numbers in Difference column and the non-supported OCAs than those which received positive numbers. In particular, they should give a higher priority to these activities when investing on the Web design in order to match the Web design with the management's priorities.

For example, the Web team needs to pay more attention to the "providing student services" and "developing new courses" activities. They are the most mismatched parts. Thus, the Web team should consider if they can shift the resources and time, which are currently being spent on the "providing student services" activity, to support the "developing new courses" activity. It is because the "providing student services" receives much support whereas the "developing new courses" does not receive any support.

When the second condition is considered by this research, those OCAs which are viewed by the management and supported by the Web site, are assigned to the Overall Support Display Diagram. Figure 5.1 (see next page) shows the results of

assigning these OCAs which were nominated by the interviewees, into the Overall Support Display Diagram. This figure also shows how the Web site can improve its design for providing a better overall support on these OCAs.

Figure 5.1 *OCAs nominated by interviewees and improvement suggestions*



In Figure 5.1, the Roman numerals are the names of the quadrants, and the numbers within the quadrants correspond to the OCAs listed in the OCA Repository provided in the Developed OCAWSEM. This diagram only shows the OCAs which were nominated by the interviewees. The solid arrows represent the direction in which the Web site should be improved in order to make the Web site support the particular OCAs fully. As shown in Figure 5.1, six activities are not supported by the highest levels of effectiveness and efficiency, which are OCA 8 (developing and providing strategic plans), OCA 14 (efficient teaching and learning), OCA 18 (facility management), OCA 19 (financial management), OCA 28 (recruiting domestic students), and OCA 30 (recruiting staff). Since these activities are nominated by the management as OCAs, they should be supported by the highest levels of effectiveness and efficiency.

The solid arrows show how the Web team should improve the Web site in terms of effectiveness and efficiency in order to support the nominated OCAs fully. For example, the Web team should provide more information and interactive features

to support OCA 8 (providing and developing strategic plans). However, the Web site already provides the support to this OCA in the highest level of efficiency. Thus, the Web team needs to provide only more information to support OCA 14 (efficient teaching and learning).

In a summary of Section 5.1, the results show that the OCAWSEM can give universities an opportunity to evaluate their Web sites by themselves. The methodology assists Web teams in knowing how their current Web practices support OCAs, and how they can improve their Web sites. There is no doubt that if the Web team has enough time and resources, they can make the Web site support all OCAs with highest levels of effectiveness and efficiency. However, the time and resources given to the Web team are usually tied. Therefore, it is important for a Web team to invest more on those Web designs which create more support to these nominated OCAs. In particular, they should pay attention first to those activities which are nominated by the management as critical but are not supported by the Web site.

5.2 Assessment Discussions

As discussed previously in Section 3.4.5, this research has identified five criteria which can be used to assess the quality of the Developed OCAWSEM. They are validity, reliability, usability, extensibility, and adaptability. The following sub-sections will discuss how well the methodology deals with the requirements of these criteria.

5.2.1 Assessment on the validity

How valid the evaluation methodology is depends on how well it measures what it is intended to measure. In this research, the validity of the Developed OCAWSEM is based on its ability to achieve three objectives what the Developed OCAWSEM is developed for. These three objects are eliciting the OCAs from management, extracting a list of OCAs which are being supported by the Web site, and determining how well the overall support is given to the OCAs by the Web site. Thus, assessing the validity of the Developed OCAWSEM depends on how well these three objectives can be achieved by applying it.

In regard to eliciting OCAs from management, a number of improvements were made to the Prototype OCAWSEM in order to enhance its validity including the definition of OCAs, Interactive Interview Questions, Interview Scoring Principles, and Interview Prioritising Principles. All interviewees from the Testing Case Study were able to nominate a list of OCAs after they were given the improved definition of OCAs. None of the interviewees answered that they did not understand the meaning of the definition of OCAs. The newly added questions helped interviewees to describe the strategic environment of the university, and concentrate their focus on the OCAs rather than functional or operational level activities when nominating the OCAs. The Interactive Interview Questions helped one interviewee nominate three Implicit OCAs after he had misunderstood the definition of OCAs and nominated a wrong list of OCAs. The Interview Scoring Principles and Interview Prioritising Principles also assisted the interviewer in generating a single list of OCAs from the diversified lists of OCAs which were nominated by the interviewees. As these improvements were made, the Developed OCAWSEM showed high validity in eliciting OCAs from management.

In regard to extracting a list of OCAs which are being supported by the Web site, the results of the Testing Case Study show that the Developed OCAWSEM is capable of extracting a list of OCAs which are being supported by the Web site and their priority. The Developed OCAWSEM is more valid than the Prototype OCAWSEM since new OCAs have been added into the OCA Repository and the Web Site Evaluation Forms, and inappropriate terms have been renamed or eliminated. Thus, the Developed OCAWSEM has a more complete inclusion of the OCAs which are being or should be supported by the university Web sites. Furthermore, more interactive features and the helpful instructions have been added into the Web Site Evaluation Forms. This also enhances the validity of methodology in extracting a list of OCAs from the Web site.

In regard to determining how well the overall support was given to the OCAs by the Web site, the approach employed in the Developed OCAWSEM is to generate two lists of prioritised OCAs from the results of the interviews and the Web site evaluation. The OCAs which are nominated by the management and being supported by the Web site are identified. The priorities of these two lists of OCAs are also noted. Then there was a discussion on the difference between the two priorities which were

given to each of the OCAs. The higher the absolute number, the poorer the support between the management desires and the Web presentation. In addition, the Overall Support Display Diagram is provided for the management to view what OCAs are poorly supported, so that strategies to improve the Web designs can be identified. Based on the previous discussion, the validity of the Developed OCAWSEM is high since it is able to achieve the objectives that the Developed OCAWSEM is developed for.

5.2.2 Assessment on the reliability

Measuring the reliability of the Developed OCAWSEM is not an easy task. As mentioned previously in Section 3.4.5, Churchill noted (1979) that the methodology is reliable if multiple independent measures made from the methodology can reach a given object agreement. However, the design of the OCAWSEM Development Process is based on the ICD. This is a "gradually developing approach" rather than a "repeatedly testing approach". Thus, Churchill's (1979) suggestion is not an ideal approach to claim the reliability of the Developed OCAWSEM. Alternatively, this thesis adopts what Hix and Schulman (1991) suggested, that a standardised approach is helpful to enhance the reliability of an evaluation methodology. This shows that the Developed OCAWSEM must be a standardised approach in order to be reliable.

The Developed OCAWSEM is considerably reliable for two reasons. Firstly, the Evaluation Process Instructions enable evaluators to take a standardised approach to measure the support. The evaluator must follow the nine stages in this process step by step. Through conducting the Developing Case Studies, improvements were made to the Evaluation Process Instructions. For example, the instruction in Stage 5 requires the evaluator to start assessing the Web site from the centre of the university Homepage to the top, the side, and the bottom until all the hyperlinks on the university Homepage are evaluated, thus providing a standardised and systematic approach to assist evaluators in the evaluation.

Secondly, the components of the Developed OCAWSEM also prove that this is a standardised evaluation methodology. These components are the definition of OCAs, interview questions, OCA Repository, the Web Site Evaluation Forms, Interview Normalisation Principles, Interview Scoring Principles, Interview Prioritising Principles, and Web Prioritising Principles. These components are utilised

in both the data collection and data analysis of the evaluation process. The definition of OCAs, interview questions, OCA Repository, and Web Site Evaluation Form 1 and 2 are employed in the data collection while the Interview Normalisation Principles, Interview Scoring Principles, Interview Prioritising Principles, Web Prioritising Principles, and Web Site Evaluation Forms 3A, 3B and 4 are utilised in the data analysis. Through the evolution in the Developing Case Studies, a number of improvements were made to these components. Thus, their reliability is enhanced. The results presented from the Testing Case Study confirm that these components are able to produce reliable results. Based on previous discussions, the Developed OCAWSEM is a reliable evaluation methodology.

5.2.3 Assessment on the usability

It is widely accepted that the methodology has high usability if it is easy for use by the users. Yet, the meaning of usability is more complicated than that when assessing the usability of the Developed OCAWSEM in this thesis. Two issues have been considered. Firstly, whether the methodology can be utilised by someone who is not familiar with the methodology. Secondly, whether the methodology can be utilised by someone who has experience of using the methodology and understands the technical terms described in the methodology. Concerning these two issues, the assessment of usability must consider how easily the Developed OCAWSEM can be utilised by two types of users – inexperienced and experienced.

In regard to inexperienced users, the Development OCAWSEM is easy to use. Hung and McQueen (2004) found that guidelines included in the Evaluation Process Instructions and the Web Site Evaluation Forms are particularly useful to the users who have less background of knowing the specific terms employed in a methodology. The Developed OCAWSEM gives a clear definition of OCAs, Interview Normalisation Principles, Interview Scoring Principles, Interview Prioritising Principles, Web Prioritising Principles, Evaluation Process Instructions, and useful instructions in the Web Site Evaluation Forms. These definitions, principles, and instructions enable the user to cope easily with some technical terms described in the methodology. For example, there are three instructions contained in the Web Site Evaluation Form 1 which define the meanings of three Web domains – Internet, intranet, and extranet. If users are not familiar with those “net technologies”, these

definitions can be helpful to them in the Web site evaluation process. Throughout the OCAWSEM Developing Process, more critical instructions and principles were added into the methodology. Its usability therefore is enhanced and considerably high for inexperienced users.

In regard to experienced users, the major concern here is not in assisting users to understand the terms, but in utilising the methodology efficiently. In other words, it is about reducing the time spent on the evaluation process. If the usability of the Developed OCAWSEM is high for experienced users, it should prevent users from wasting time in conducting repeated tasks, and save their time in reading instructions and recoding results. Two columns were added into the Web Site Evaluation Form 2, which require the evaluator to record not only the title of the sub-site supporting an OCA, but also how it was found and the specific features in the sub-site. Since how the sub-site was found is recorded, the evaluator can save time when revisiting the sub-site if this is needed. By referring to the specific features recorded in the Web Site Evaluation Form 2, the evaluator can also save time on filling out the Web Site Evaluation Form 3A.

Moreover, some improvements were made to the Developed OCAWSEM to save users time on reading instructions. These include: separating different kinds of principles to forms, bolding key words in various principles, and listing the OCAs in OCA Repository and the Web Site Evaluation Forms alphabetically. In addition, the descriptions of the Web site evaluation criteria were separated into a new form. This allows the evaluator to read the descriptions more easily from one form (Web Site Evaluation Form 3A) while recording results on the other form (Web Site Evaluation Form 3B). So time is saved. The Developed OCAWSEM also saves users time on recording results by listing OCAs in the Web Site Evaluation Forms and the OCA Repository, and recording the OCAs alphabetically. These improvements speed up the time on searching specific OCAs. Thus, the Developed OCAWSEM also has high usability for experienced users.

According to previous discussions, the Developed OCAWSEM can be easily utilised by both inexperienced and experienced users. Thus, the usability of the methodology is considerably high.

5.2.4 Assessment on the extensibility and adaptability

The methodology is extensible if it is sensitive to the advances in the technologies which it tends to measure (Hix & Schulman, 1991). The technology studied in this thesis is the Web site. The Developed OCAWSEM is sensitive to the state-of-the-art Web technologies. Through the seven Developing Case Studies, the state-of-the-art Web features were added into the description of the Level 3 support in the Web Site Evaluation Form 3B, for example, online payment, exchange of personal information. The methodology is still extensible in the future. Any sophisticated feature found during the Web site evaluation can be added into the description of the degree of support in the Web Site Evaluation Form 3B. Thus, the extensibility of the methodology is high.

In order to claim adaptability, the methodology must be adaptable to the specific environment in which the methodology is used (Hix & Schulman, 1991). Since this research has developed and tested the Developed OCAWSEM in all universities in New Zealand, it is shown to be highly adaptable to the environment of these universities. However, this does not mean that it can be adaptable to the universities in other environments, such as other countries or other industries without any modifications. However, some modifications can be made in the future in order to apply the Developed OCASEM in other environments. It is because the OCA Repository and the features used to differentiate the levels of criterion "interactivity" can be extensible. Then, these two components can be adaptable to extract specific OCAs from management and to evaluate specific Web features in other environments; for example, modifying the terms in OCA Repository to match the terms utilised specifically in the insurance industry. Thus, this research claims that the Developed OCAWSEM is adaptable to other specific environments by adding some simple modifications.

5.3 Chapter Summary

This is the second chapter presenting the research results in this thesis. It aims to present the results of testing the Developed OCAWSEM in the Testing Case Study. A step-by-step process of applying the Developed OCAWSEM and how the evaluation results had been generated were provided in the first section. Then, the five

assessment criteria – validity, reliability, usability, extensibility, and adaptability have been applied to discuss the quality of the Developed OCAWSEM. This thesis claims that the Developed OCAWSEM is a valid and reliable evaluation methodology which can be easily utilised by inexperienced users. The methodology itself is also extensible, and is adaptable to other environments by the addition of some easy modifications.

CHAPTER 6

RESULTS PART III:

LESSONS LEARNED

This is the last chapter presenting the research results of this thesis. The preceding two chapters presented the results produced from the development and evaluation tasks described in Chapter 3, that is, improvements made to the Prototype OCAWSEM in order to produce the Developed OCAWSEM (Chapter 4) and the results of testing the Developed OCAWSEM (Chapter 5). The results of the third task – the learning task – as described in Chapter 3, are presented in this chapter. Because the learning task was conducted in both the Developing Case Studies and Testing Case Study, this chapter thus will present the lessons learned from the eight case studies.

Section 6.1 of the chapter will discuss the lessons learned from the semi-structured interviews. Many useful lessons to overcome the difficulties faced in the interviews will be discussed. Section 6.2 outlines the lessons learned from the Web site evaluations. Some suggestions will be given for dealing with the difficulties faced while evaluating the Web sites and several critical issues considered in the evaluation process will be discussed. Section 6.3 will discuss the lessons learned about OCAs. It focuses on understanding the concept of OCAs and the causes of the variant views among management when they are required to nominate a list of OCAs. Section 6.4 will show the lessons learned from developing the OCAWSEM. These lessons are particularly useful in developing or modifying the development evaluation methodology into a new evaluation methodology which can be utilised in other environments. The last section is the summary of this chapter.

6.1 Lessons Learned from the Interviews

This section will present the lessons learned from conducting the semi-structured interviews in the case studies. These lessons are useful for the interviewer to deal with the difficulties encountered when eliciting lists of OCAs from management, which include inability to nominate any OCA and inability to prioritise the nominated OCAs given. Moreover, this section will also identify some common mistaken answers made by the interviewees when nominating OCAs, and the types of interview questions which should be posed in the interview.

6.1.1 Dealing with "unable to nominate"

Ideally, the interviewees should be able to give a list of OCAs after they are given the definition of OCAs. However, not all of them could do this. There were at least three common reasons why they could not give a list of OCAs: they did not remember the definition; they did not know any OCA; and, they did not understand what an OCA was. In order to elicit a list of OCAs, these situations had to be dealt with. Three scenarios have been identified based on these three reasons. Under each scenario, suggestions have been made in order to assist the interviewer in eliciting a list of OCAs from the interviewee.

6.1.1.1 Scenario 1 – Do not remember the definition

The first scenario is that the interviewee just forgets the definition of OCAs. This possibly occurs because the notion of an OCA is new to them. Thus, they are unable to respond to the question immediately. They need more time to think. While they are thinking of what the OCAs in the university are, they simply forget the definition. Some interviewees asked for the definition to be repeated again, while some were just silent for a while and said that they could not answer the question.

If this scenario occurs, it is helpful to repeat the definition of an OCA. For example, three interviewees from University H could not identify any OCA until they had been given the definition of OCAs again. Thus, it is useful to repeat the definition of OCAs when this situation occurs.

6.1.1.2 Scenario 2 – Do not know any

The second scenario is that the interviewee does not know what OCAs the university is currently conducting after the definition is repeated. This was a particularly common scenario when asking the interviewee in the lower levels of management. They normally had difficulties in answering what OCAs the senior management team was regularly discussing at that moment because they were not involved in the senior meetings and were not aware of the senior management's emphasis. For example, one interviewee explained that she was not sure about the emphasis from the top:

> *I don't really know. I am worried about the library, I don't really worry about…I mean I worry about focusing on the users we have, and I don't worry about the vision.*

When this occurs, it is useful to ask the interviewee what the message or emphasis coming down from the senior management team or higher levels of management they feel is. One Interactive Interview Question included in the Developed OCAWSEM, "What are the messages or emphasis coming down from the senior management team at the moment?" helps achieve this. Asking this question also provides an opportunity to triangulate the views received from the senior management team.

6.1.1.3 Scenario 3 – Do not understand the meaning

The third scenario is more complicated than the previous two. This occurs when the interviewees still could not identify any OCA after they being given the definition of OCAs again and asked to express what they felt the messages or emphasis coming down from the senior management team were. When this occurs, there is a need to elaborate the meaning of OCAs by using some other terms. There were many terms used during the interviews in the case studies. Table 6.1 summarises the terms that have been incorporated into the interview questions and were helpful in identifying OCAs from management.

Table 6.1 *Helpful terms for identifying OCAs from management*

Helpful Terms	Sample Questions
Important things	What are the important things in this university?
Top priorities	What things are the top priorities for this university to do at the moment?
Things concentrated on	What things are concentrated on at this university at the moment?

It is important to notice here that sometimes these questions are not valid for some interviewees. It is necessary to incorporate all of the terms in the questions. Therefore, this research incorporates these terms into an Interactive Interview Question – "What are the important things, top priorities, and things being concentrated on at this university at the moment?" This question should be posed when the third scenario occurs.

Table 6.2 summarises the terms which were inappropriate in identifying OCAs. These terms should be avoided during the interviews. The reasons why they were inappropriate are also included in Table 6.2 (see next page).

It is important to ask the interviewee how the university defines its success before giving the definition of an OCA. This is because OCAs have a close relationship with how the interviewee defines the success. For example, one interviewee believes that whether the activity they are conducting is an OCA depends on how they define the meaning of success. Another interviewee also said that he believed the success of all institutions depends on financial viability. This can explain why he prioritised the "recruiting students" activity as the top priority because good recruitment is critical to maintain their success – the financial viability. However, for

universities which measure their success based on academic reputation, strong research capability or the quality of teaching, the "recruiting students" activity would not be the top of the OCA list. Therefore, asking interviewees to explain how the university defines its success can help them identify OCAs. This provides more opportunity to elicit both Explicit and Implicit OCAs.

Table 6.2 *Inappropriate terms for identifying OCAs from management*

Inappropriate Terms	Reasons
Competency	This term is similar to OCA because it is important to enable universities to achieve success. However, it is different. Mostly, the interviewees referred to the special programmes they were offering as their competencies.
Strength	This term is similar to competency, but was mostly used by interviewees to denote those things in which they are superior than their competitors, such as, location, size, history, and research areas.
Excellent area	This term particularly refers to the excellent areas of study.
Important project	This term specifically refers to projects only rather than activities.

Furthermore, if the interviewee still cannot give any OCA after answering how the university defines its success and being given the definition of the OCAs again, the interviewer can ask the interviewee what activities help the university achieve its success.

In summary, each of the three scenarios discussed above needs a different strategy to elicit a list of OCAs from the interviewee. Proper interview questions from the Interactive Interview Questions given by this research should be selected in these scenarios. It is also useful to ask how the university defines its success before giving the definition of OCAs. However, the interviewer should be careful not to choose these inappropriate terms listed in Table 6.2.

6.1.3 Dealing with "unable to prioritise"

After giving a list of OCAs, the interviewees were asked to prioritise them. Some of the interviewees had difficulty doing this. Interestingly, for those interviewees who are not involved in the senior management meeting, there are at least four common reasons that they are unable or reluctant to prioritise the OCAs.

Firstly, they believe that only the senior management team has the power to prioritise these OCAs. Secondly, every OCA is important to them because they

receive emphasis from different members of the upper management team. This reason was given particularly by the lower level management staff members. For example, one interviewee deals with different departments in regard to the Web site. There are many requests made to him. Therefore, he can point out many OCAs. However, it is very hard for him to prioritise them because everything is equally important to him.

The third reason is that they believe some OCAs are interlinked and they are not willing to prioritise them. One example was given by one interviewee shows the interrelationship between the "recruiting students" and "providing quality teaching" activities:

> *If you had a restaurant with a good chef, no one comes in and tries and sees how good the chef is because they get put off by our bad restaurant service. Changing the quality of the chef doesn't actually get them in the door. However, you've to make them feel "this looks attractive to me"... then, people start to eat, and said, well, I enjoy that as well. This shows that we need the physical packaging which is the services of the offer as well as good quality academic programmes.*

Lastly, sometimes interviewees just do not know how the OCAs can be prioritised because the OCAs are equally weighted in the university. For example, one interviewee believed that teaching and research are equally important:

> *They are probably equally important, teaching and research. I think most of members of the public often think teaching. That's why they get our university, but research is still important.*

Another interviewee at the same university believed there is not any difference in the priority between teaching and research:

> *If you look at research and teaching, it's not much difference between them at the top.*

One interviewee at another university commented that research and teaching are not only equally important, but interlinked:

> *I don't think you can prioritise because a good university should have research-based teaching, the research should inform their teaching*

practically. I am not sure if I can prioritise them, probably equally important. They are also interlinked.

This research found that teaching, research, funding, and reputation have an interrelationship. Better research can enhance teaching; better teaching will create a better reputation; a better reputation will generate more students and funding; more funding will create more opportunities to do more profound and outstanding research. This is an effect loop. In this situation, it is hard to prioritise the OCAs.

Although some of the interviewees felt it was difficult to prioritise the OCAs for various reasons, it is necessary for this research to discover the ways to help interviewees prioritise them in the interviews. Before knowing how to help interviewees prioritise their lists of OCAs, it is helpful to learn from the reasons which were used by some interviewees to prioritise their OCAs. In total, eight reasons, which were adopted by the interviewees, are listed below:

1. Which one is resourced more?
2. Which one is discussed more?
3. Which one provides more support to the university's strategy?
4. Which one is the primary activity?
5. Which one is logically first?
6. Which one contributes to the university income more?
7. Which one helps solve current problems?
8. Which one contributes to longer term success to the university?

This list shows that the interviewees gave priorities to the OCAs based on a number of reasons. These reasons can be used in the interview questions when the interviewee has difficulties in prioritising the OCAs. No matter which basis is used, the fundamental principle is that the OCA prioritised higher in a list should be the one with most ability to help the university achieve its success.

6.1.2 Clarifying common mistaken answers

After the interviewees were given the definition of an OCA, there were at least four common mistaken answers related to OCAs. These are discussed below.

6.1.2.1 Common mistaken answer 1 – job critical activities

The interviewees commonly give some activities which are critical to the success of their jobs. This type of activity is termed job critical activities (Job CAs) in this thesis. Job CAs are different from OCAs. One interviewee discussed the differences between OCAs and Job CAs:

> *In my area, research, particularly finding and securing external research funding – that's what my team really does. When you start to go up to the macro level of the university, you sort of get back to those teaching and learning sides. I don't have a lot of knowledge about that. Which one do you want me to focus on?*

Functional managers have the greatest likelihood of giving a list of Job CAs. Even some interviewees in the senior management team gave Job CAs. For example, one senior management member did not identify OCAs based on her own opinion of the university's success, but by referring to the issues constantly discussed in the senior meeting, such as budgeting, and employment; also another senior management member mentioned that maintaining their relationship with the government is critical. Although these can be OCAs because they are the issues discussed regularly in the senior meetings and receive attention from the highest level of management, it still needs to be clarified whether these activities are critical to interviewees' jobs or to the university. Thus, more interviewees are needed to triangulate the data.

Thus, after giving the definition of OCAs, it is important to ask the interviewee to identify the OCAs from the organisational perspective and to ask them to view the university as a whole rather than from a functional or departmental perspective.

6.1.2.2 Common mistaken answer 2 – departmental critical activities

Some interviewees, in particular some departmental managers, mentioned a range of activities which were critical to the department's success (the department can be either academic or functional). They believed that these activities were OCAs although they were not. They are termed departmental critical activities (Departmental CAs) in this thesis. For example, one interviewee spoke concerning numerous activities according to the ITS plan. It is therefore important to ask the

interviewee to identify a list of activities important to the organisational success rather than to the departmental.

6.1.2.3 Common mistaken answer 3 – critical projects

It is important to distinguish between "critical projects" and "critical activities" when identifying OCAs. Because they are both activities with a significant amount of resources and time spent on them, it is easy for some interviewees to confuse them. However, an OCA is an activity conducted constantly although its priority could be changing all the time. It is different from a critical project. The critical project is a project which means that it is not conducted constantly and it must have start and end points. A critical project can be considered as an important activity of limited duration, for example, two months or two years.

As one interviewee noted, projects are listed in the operational plan. It is easier to prioritise projects because projects are prioritised in the operational plan. It is not surprising that interviewees give a list of "critical projects" in the interview. For example, one senior management member mentioned that developing new buildings is critical because they spend significant amounts of money on this activity. Although it is critical, developing new buildings is not an OCA. It is a critical project.

6.2.2.4 Common mistaken answer 4 – organisational objectives

Organisational objectives were given by several interviewees as OCAs in the case studies because they believed these objectives were critical to the university's success. For example, the managers from both University B and University E believe OCAs can be derived from objectives in their strategic plans. However, organisational objectives and OCAs are different and should not be confused.

This research found that the OCAs may have a relationship with the objectives listed in the strategic documents. For example, one interviewee mentioned that they generated OCAs from the objectives listed in their strategic document, and then would conduct these OCAs in the next few years:

> *And there is a whole range of things that you have probably seen in that document [the strategic document]. Within that, I've got a whole range of specific action that we need to follow through…So, over the next few*

years, we will be putting in place activities that let us achieve all of those objectives.

Thus, it is possible that these objectives lead the OCAs which the university is conducting. However, organisational objectives are not OCAs. To be something (an objective) does not mean to do something (an activity). In addition, an activity includes more than just what to achieve (the objective of the activity), but also the actions that should be included in this activity. Thus, these two terms present what the university is doing (the activity) and what the university wants to be (the objective). Because this research is concerned with OCAs, the focus is on identifying the things that they are actually doing that are critical to the university. Ideally, if the management is well informed and performs according to the strategic documents, the OCAs identified should enable them to achieve their objectives.

6.1.4 Types of interview questions

This research categorises those five types interview questions listed in the Interview Guide and used to elicit a list of OCAs from the interviewee. The first type is the Formal Interview Questions on describing the strategic context of the university. These questions include "How does this university define its successes?" and "How does this university compete with other universities?"

The second type is the Formal Interview Question to elicit Explicit OCAs. The interviewer asks the interviewee to nominate a list of OCAs after the interviewer has been given the definition of OCAs. The question is "Please describe what this university's organisational critical activities are".

The third is the Formal Interview Question on prioritising the Explicit OCAs. The interviewer asks the interviewee to prioritise the OCAs which were nominated by the interviewees. The question is "What is their priority (the nominated OCAs)?"

The fourth is the Formal Interview Question on understanding the meaning behind the term of the OCAs nominated by the interviewee. The question is "How does this university support and enable these organisational critical activities, and which ones are more important?"

The fifth type is the Interactive Interview Questions which should be posed during various circumstances including: when the interviewee cannot nominate any of

OCA; when the interviewee gives non-CAs; when the interviewee cannot prioritise the OCAs which they have nominated; when needing to elicit Implicit OCAs from the interviewee; and when needing to confirm that the activities nominated by the interviewee are OCAs. There are eight Interactive Interview Questions:

- According to your feeling, how does this university define its success?
- What are the messages or emphasis coming down from the senior management team at the moment?
- What are the important things, top priorities, and things concentrated on at this university at the moment?
- Are those nominated organisational critical activities you believe being conducted currently and are they critical to the university's success?
- How does this university support these organisational critical activities specifically and differently from other universities?
- Does the senior management team discuss these organisational critical activities regularly?
- Does this university spend a lot of resources on these organisational critical activities?
- Which one is discussed regularly, resourced significantly and emphasised most by the senior management team at the moment? (If the interviewee does not know the emphasis from the senior management, ask his or her feelings).

If the time is available, the interviewer can pose all five types of interview questions. However, from a more practical perspective, some interviewees put a time limit on the length of the interviews. For example, some interviewees, particularly the senior staff members, required the interviews to be completed within 20 to 30 minutes, one interviewee only allowed within 10 minutes. They declined to be interviewed in the future. When this is the case, the interviewer should consider prioritising the five types of interview questions before the interviews. For example, when considering the purpose of this research, eliciting Explicit OCAs and prioritising them should have a higher priority than eliciting Implicit OCAs. Thus, the types of questions which can be utilised to elicit Explicit OCAs should be posed earlier.

6.2 Lessons Learned from the Web Site Evaluations

This section will present the lessons learned from conducting the Web site evaluations in the case studies. These lessons are useful for the evaluator to deal with the difficulties faced when evaluating the Web contents and features of the Web sites, judging which OCAs are supported by sub-sites, counting the number of sub-sites in supporting the OCAs and dealing with the complicated Web structure during the Web site evaluations. Some lessons regarding to the evaluation perspective and criteria adopted in this research will be also presented.

6.2.1 Evaluating the Web content

At a micro level, the content of a sub-site can be broken down into pieces of information and documents. Most commonly, Web evaluators will face difficulty when making a decision on:

1. Whether the document/information is strategic or non-strategic; and
2. Whether the document/information is these are departmental or organisational.

Most often, the university Web sites provide a section for users to download or to browse over a range of documents and information. This information is either strategic or non-strategic. If the document or information is strategic information, it supports the "strategic information provision" activity. If not, it supports the "enhancing internal administrative efficiency" activity.

The principle used to differentiate between a strategic and non-strategic document (or information) in this research is what the main purpose of the document or information is and whether it is used to support strategic or non-strategic level activities. For example, a policy, regulation, some announcements for general staff members, or ITS Business Plan are not strategic because their main purpose is not to support activities at the strategic level. However, the Charter and University Strategies are strategic documents because they are mainly used to support strategic level activities.

The same principle can be applied to differentiate between departmental and organisational documents and information. Sometimes, departmental documents appear on organisational Web pages. If the Web page explicitly shows that these

documents are used to support organisational activities, they can be counted as organisational documents. If not, they are still departmental documents. Moreover, if the documents are referred to by the hyperlinks on the organisational Web pages, they are serving the organisational level users. Thus, they are still counted as organisational documents.

6.2.2 Evaluating the Web features

Web technologies are advancing every day. One major challenge faced when evaluating a Web feature was to judge what level of interactivity the Web feature belonged to. There were several issues which arose in the case studies. Firstly, some pages contain email hyperlinks for users to send emails to the university's staff. This feature's interactivity was ranked at level 2 of the interactivity criterion although it seemed that the email hyperlink should be ranked at level 3 because the university staff might respond the email immediately. However, using the email cannot guarantee real time communication. Thus, the email hyperlinks are ranked at level 2.

Secondly, providing online forms for downloading is ranked differently from the online form which allows users to write information online immediately although they are sometimes both termed "Online Forms" on the university Web sites. For example, the Memorabilia sub-site of University C provides an online form to be downloaded. Users can download the form, fill out the form, and then post the form back to the University. Yet, this is different from the online form which allows users to write information online immediately. The former is not a one-way communication while the latter is. Thus, only the sub-sites which provide forms enabling information to be added online, can be ranked at level 2.

Thirdly, a drag-down menu feature can upgrade the interactivity of a sub-site only to level 2. Some sub-sites provide search features for users to find particular information. These search features can be two generic types: drag-down menus and search engines. Either can be called "Search" by the sub-sites. However, they are given different levels of interactivity. The search engines belong to level 3 while the drag-down menus belong to level 2. The reason for ranking drag-down menus as level 2 is because this type of feature has limited information for searching. Users can only choose the information in the menu. This is similar to the Frequently Asked Questions (FAQs) and is able to upgrade the sub-site's interactivity to level 2 only. For example,

University C's Web site provides a drag-down menu for searching for news on different dates. The University B's Web site also designed a drag-down menu for users to search for jobs. These features only upgrade the sub-sites' interactivity to level 2.

Fourthly, some sub-sites are inaccessible for certain reasons. In particular, the financial sub-sites of universities are inaccessible due to security and secrecy concerns. Therefore, it is impossible to evaluate what interactivity these sub-sites have without the access. Hence, evaluating the information introducing the features available on the sub-site is helpful. Some password-protected features or sub-sites do provide information to describe what activities the user can conduct once they enter into the sub-site. For example, the Career Hub at University D is password-protected. However, it provides plenty of information to introduce the sub-site. The interactivity level of this sub-site could be evaluated based on this information.

6.2.3 Judging the OCAs supported by sub-sites

Similar to judging interactivity, making a decision on what OCAs the sub-site is supporting is not easy because complexity of Web sites and it also needs a certain degree of subjective judgment. This research provides six useful hints to help evaluators in judging what OCAs the Web site supports. In addition, it also identifies three common issues which should be considered by the evaluators during the evaluation. They are discussed in the following sub-sections.

6.2.3.1 Six useful hints

This research adopted the organisational providers' perspective to evaluate Web sites. For this research, it is important to consider the question of who can get access to the sub-site and focus on the purpose for which the sub-site was designed and the reason the provider developed it when judging the sub-site. In line with this, six useful hints have been suggested.

Firstly, check objectives of the sub-site. Sometimes it is easy to find the objectives of the sub-site from the text of the front page. For example, the objectives of one university's sub-site can be found in the beginning of the text on its front page. It says "We are building a vibrant sport and recreation culture at University A". Thus, it is not surprising that this sub-site supports the "creating university culture" activity.

Secondly, check the title of the page. Usually, every sub-site or even Web page has a title describing the content of the page. This title can give a clue as to what activities the sub-site or Web page is supporting. If the title cannot be found in the content of the page, it may be located on the left top corner of the Internet Explorer screen.

Thirdly, check the intended users the sub-site is targeting. Although every kind of user can access an Internet sub-site, there should be several groups of intended users to whom the sub-site provides services. After identifying the intended users, it is easier to define what activities the sub-site is supporting.

Fourthly, check the path referring to the sub-site. Checking the path referring to the site helps identify what activities the site is supporting. For example, the sub-site referred by the hyperlink named "Student Services" should support the "providing student services" activity. Another example is that the "Courses and Subjects" sub-site can be used to support the "developing new courses" activity if the "Courses and Subjects" sub-site is referred by a hyperlink located on the staff Homepage. This is because providing the hyperlink on the staff Homepage allows staff members to access the "Courses and Subjects" sub-site. One important purpose should be allowing the lecturers to develop new courses.

Fifthly, check the content. Evaluating the title of the page helps clarify what activities the sub-site is supporting. However, in some cases the title can be misinterpreted to lead to the conclusion that the sub-site supports certain OCAs which it does not support. For example, the "Financial Assistance" sub-site in University D's Web site provides learning-related services to students rather than general services. The "News" sub-site usually provides important news, and it thus supports the administration activities. Some university Web sites, for example, University E, provide entertainment-related news for staff members. Thus, it supports the "retaining staff" activity. Thus, reviewing the content of the site is necessary when judging the sub-site.

Lastly, check the domain. It is helpful to check what domain the sub-site is connected to and where the hyperlink pointing to this sub-site is located because both of these things could provide information for judging what activities the sub-site is supporting. For example, the "Students and Learning" sub-site in University B's Web site is located on "Staff Homepage" (an intranet Web site). In this case, it can be

recognised as supporting "internal administrative efficiency". Another example is that University D adds a hyperlink to the "Online Course Catalogue" on the "Teaching Support" section of the staff intranet Homepage. Not surprisingly, the "Online Course Catalogue" supports advertising. However, because of the location of the hyperlink, another possible purpose is to help lecturers to develop courses. Thus, this sub-site could be used for both the "developing new courses" and "advertising" activities depending on where the hyperlink is located.

6.2.3.2 Three common issues

There are three common issues which need to be borne in mind when judging sub-sites. Firstly, whether the "Library" sub-site supports the "developing research" activity. This research does not count this sub-site as supporting this activity even though developing research requires researchers to access the information in the Library sub-site. If it is counted, all university Web sites will have support of the "developing research" activity at highest level for both effectiveness and efficiency because the "Library" sub-site is one of the largest and most sophisticated sub-sites. The Developed OCAWSEM should be able to identify what OCAs are being supported well and what areas can be improved. If the "Library "sub-site is counted it will be more difficult to understand how well the Web supports the other lower level of activities under the "developing research" activity. Thus, the "Library" sub-site is not counted as supporting the "developing research" activity.

This research treats the Library sub-site as only one single site to support the "providing library services" activity. It does not evaluate the second and third levels of the sub-site because these levels of sub-sites are particularly supporting the lower levels of activities of the "providing library services" activity, such as, recalling books, renewing books, and searching for books.

Secondly, the advertising, recruiting, and enrolling activities are sometimes confusing because they are all included in the enrolment process. This makes it difficult to decide what OCAs some sub-sites are supporting. For example, does the Courses and Degrees sub-site support advertising, recruiting, or enrolling or all of them? These activities can be differentiated according the categorisation of users shown on the University D's Web site. In the Homepage, it separates those students who are not current students as being either prospective students or enrolling students.

This means that prospective students can be distinguished as those who are applying for study, and those who are not applying for study. For those who are not applying for study, they can be further categorised into two: those who have not decided to apply and those who have decided to apply. This categorisation is summarised as:

1. Advertising stage: Students who have not decided to enrol;
2. Recruiting stage: Students with particular interests and who have decided to enrol, but have not applied yet;
3. Enrolling stage: Students who have decided to enrol, and are applying and enrolling.

Thus, if the information and features only advertise the image of the university, they are categorised as supporting advertisement. If the sub-site and features show a strong message that they should be utilised by the students who are considering the enrolment of the university, they are categorised as supporting recruitment. If the sub-site and features are important sources for the students who are enrolling, they are categorised as supporting enrolment.

Because this research adopts the organisational provider's perspective, whether the students are satisfied by the Web site's provision in these stages is not the focus of this research. Instead, this research is concerned with how well the Web site can support the university's advertisement, recruitment, and enrolment activities in terms of informativeness and interactivity. For example, from the student's perspective, the "Fees" sub-site can be utilised by those students who have not decided, decided to enrol, or even are enrolling into the university. From the organisational provider's perspective, the "Fees" sub-site supports their advertising. However, if the "Fees" sub-site shows strong signs of turning those prospective students into "interested students", it supports recruitment to the university.

Another good example to demonstrate the evaluation from the organisational provider's perspective is the Prospectus supplied through the hyperlink on the Staff Homepage. One of the universities places a hyperlink of the "Prospectus" sub-site on the Staff Homepage. From the user's perspective, this hyperlink does not provide any advertising information for them because they cannot get access to the "Prospectus" through this hyperlink. However, from the organisational provider's perspective, the staff or course advisors can access the prospectus and print it out for students while

they are introducing the course information. Thus, the "Prospectus" sub-site still supports advertising activity or even recruiting or enrolling activity depending on the content of the sub-site.

Thirdly, is the decision of whether the "Room Bookings" sub-site can be used to support the "enhancing internal administrative efficiency" or "efficient teaching and learning" activity? This sub-site is considered by this research as supporting the "enhancing internal administrative efficiency" activity because the academic staff members can book lecture rooms through it in an efficient way. Moreover, the sub-site does not support the "efficient teaching and learning" activity directly because the sub-site does not help perform teaching activities.

In conclusion, these useful lessons, common issues, and suggestions can help evaluators' judgement of what OCAs a sub-site is supporting more reliable and valid.

6.2.4 Counting the number of sub-sites in the support

After evaluating all sub-sites, the evaluator needs to count how many sub-sites support each OCAs. The difficulty faced is that a particular sub-site may be recorded many times as supporting an activity. This is because the hyperlink pointing to this sub-site appears in many different places on the Internet, intranet, and extranet Web sites. For example, the hyperlink to the "Accommodation" sub-site could be placed on the "Current Student" sub-site, the "Student Services" sub-site, and on the Homepage of the "Student Intranet". In the record, the "Accommodation" sub-site is counted as supporting the student service activity three times. The issue is whether this sub-site should be counted three times. The answer made here is maybe not.

It is crucial to differentiate between two types of counting here, content-oriented and design-oriented counting. If the counting is content-oriented, then one sub-site can be counted only once for supporting an OCA, irrespective of how many hyperlinks are pointing to it. If the counting is design-oriented, one sub-site can be counted many times. This research is based on the content-oriented approach. This approach is only concerned with how much information and how many interactive features there are on a sub-site regardless of how many hyperlinks will enable users to access it. While the content-oriented approach is from the provider's view to evaluate Web sites, the design-oriented approach is from the user's point of view. Because this

research evaluates the Web sites from the provider's view point, the content-oriented approach is taken.

This research not only covers Internet Web sites, but also intranet, and extranet Web sites. This research treats these three domains of Web sites as three separate Web sites owned by a university. Thus, if the Internet sub-site is pointed to by the hyperlinks located on intranet and Internet Web pages, this sub-site can be counted twice. When applying the content-oriented approach to these three types of Web site, those hyperlinks placed on each of the Internet, intranet, and extranet domain can be counted only once for supporting the activity.

Counting the sections can also adopt this principle. Some sections on a sub-site, for example, a "Notice Board" section on "News & Events" sub-site, provides documents or Web pages that dynamically show part of the content of other sub-sites. If this part of content is on the same net domain with the "News & Events" sub-site, it can only be counted once either from the sub-site where it is located or from the original sub-site. Thus, it is important to pay attention to the net domain in which the hyperlink or the section is located.

6.2.5 Dealing with the complicated Web structure

Since hundreds of university sub-sites are interlinked, there could be thousands of "paths" contained in a university Web site. It is not surprising that there are different paths to link from one sub-site to the other. One path could be longer than another. However, how long the path is will have decisive influence on the Web site evaluation. This is because in this research two is the maximum level of sub-site to be evaluated. If the sub-site is reached by clicking once from the university Homepage, all the hyperlinks and information on this sub-site will be evaluated. However, if the sub-site is reached via another sub-site and is the lowest level of sub-site, all its hyperlinks and information on the sub-site will not be evaluated. Thus, if a sub-site can be reached by different paths, it is better to consider the shortest path as the way to reach the sub-site and disregard the results recorded based on using the longer paths because this will create an opportunity to evaluate the sub-site in detail.

For example, to reach the Extramural sub-site in University C's Web site, it takes three clicks from the "Future Students" hyperlink on the university Homepage. Thus, this sub-site should not be evaluated. However, it was found later that this sub-

site could be reached by just clicking the "Extramural" hyperlink on the university Homepage. If this path is taken, it is necessary to evaluate all the content of this sub-site.

Another issue was identified when evaluating University D's Web site. This relates to what kind of sub-sites should be counted. In this research, two levels of sub-site are evaluated. However, the issue is whether sub-sites which only contain hyperlinks which point to other sub-sites, should be counted as a level. Because they only contain hyperlinks, it is impossible to evaluate how informative they are. Thus, they are not counted as a level of sub-site. However, if they contain some helpful information, they are counted as one level. For example, to go to sub-site C from sub-site A, the user has to pass sub-site B. If the sub-site B contains some relevant information in one page, then this sub-site is counted as one level and one sub-site. If sub-site B contains only hyperlinks pointing directly to sub-site C, the site B is not counted as one level and one sub-site.

Because the structure of university Web sites is very complicated, it is a challenge to avoid getting lost in thousands of Web pages during the evaluation. Therefore, the evaluation principles listed in the Web Site Evaluation Forms are helpful. Evaluators should start from evaluating and recording every hyperlink and information on the university Homepage first. Then this should be done on the first level of sub-sites to the Homepage. It is very important to follow these principles to avoid being lost in the Web site. Without keeping this in mind, one may miss out evaluating certain sub-sites or evaluate some sub-sites many times.

6.2.6 Lessons regarding to the evaluation perspectives

As shown in Chapter 2, the evaluation perspective can be either from the provider or the user. The case results did confirm this argument. Some interviewees did differentiate between these two perspectives. For example, one interviewee classified two types of users of their Web site. One is the people who publish information, and the other is the people who read it or who interact with it. The user who publishes information belongs to category of "provider" mentioned in this thesis while the people who read it or who interact with it are the users of the Web site. Another interviewee also mentioned that Web design has an impact on the users rather than on

the providers. He used the terms "a provider's perspective" and "a student's perspective".

It is not surprising that most often interviewees consider the success of Web site can be evaluated from the user's perspective only. This is also the emphasis in the Web site evaluation literature. One common reason is that they think that they have enough, or perhaps too much, information in their Web sites. Thus, their focus is on making the information easy to find for different kinds of user. This is an important issue mentioned by all the Web Committees in the eight universities. Of course, this concern is critical to a university. However, fulfilling user's needs does not equal fulfilling management needs. This research is not trying to argue about which perspective is more important. Instead, this research intends to argue that Web sites not only need to fulfil different user's needs, but also need to fulfil the management's needs. The management's needs can be fulfilled when the Web site fully supports the OCAs.

Although both the user and provider are concerned with whether the Web site provides certain kinds of information and whether the site can be easily used for seeking information, their roles are different in relation to using the Web site to support OCAs. The provider's role is to provide enough Web content to support those OCAs. The user's role is to use the Web site to conduct those OCAs which they are involved in. The provider provides: the user uses. Therefore, the providers cannot evaluate how easy it is to use the Web site properly unless they become the users, and the users cannot evaluate how well the Web site achieves the provider's OCAs effectively unless they know these OCAs.

This is an illustration to demonstrate the difference. For those interviewees who used other university Web sites (and thus became users), their judgement of the Web sites was based on how easy it was to find the information they desired. Sometimes, interviewees, particularly from the Web committee, used more criteria to evaluate others' Web sites. They looked at not only how easy it is to find information, but also at the structure of information, the consistency of the site, the look and feel, and new functions. These are most commonly seen as "user-oriented criteria". However, when they were asked how the Web site could support activities from a provider's perspective, they mentioned providing information and communication to the users. For example, two interviewees revealed that providing information is

critical to support OCAs, and is an important criterion to evaluate the support. One interviewee also suggested that both information and communication are two important criteria. Thus, these interviewees had different evaluation criteria when they became users from when they were speaking as providers.

6.2.7 Lessons regarding to the evaluation criteria

As discussed in Chapter 2, the kind of evaluation criteria required in Web site evaluation should be derived from the evaluation perspective. The criteria which are required from the organisational provider's perspective for the evaluation on how well the Web site is supporting OCAs include three fundamental criteria – informativeness, interactivity and consistency.

Informativeness is concerned with how much information the Web provides. Several interviewees agreed that this is an important criterion for evaluating the Web site from the provider's perspective. For example, one interviewee argued that delivering information is a driving force for the Web:

> *I think it comes in line with the acceptance of the Web in terms of being a significant force for delivering information.*

Another interviewee noted that the providing information is critical to support services:

> *It is very important to provide services about the information architecture, what information users want to see.*

This interviewee suggested that more information provided means more support to the activity. He used a comparison between international sub-sites and domestic sub-sites to illustrate this. The "international recruiting" activity receives more support from the Web site than the "domestic recruiting" activity because more information is used to support the "international recruitment":

> *Most information is specifically for international students – because there is a whole international student section, but there is no whole domestic student section.*

Interactivity is concerned with how the communication functions work. As one interviewee noted, the Web is a two-way communication mechanism:

> *A Web site is a two way communication mechanism for the clients of the university to get things from the university, and it is for the university to get things to its clients and potential clients.*

Another interviewee also mentioned not only information but also communication as a way they want their Web site to support them:

> *We emphasise two-way communication about the Web site. Engagement, how to engage the audience, and what is an audience and we particularly look at the interactive nature and feedback.*

Through the Web, both the provider and the users can benefit. In particular, creating efficiency through the Web is one of the major concerns for the senior management as noted by one interviewee:

> *They [the whole university Web site] will create efficiency in terms of the way our students and staff operate ... it's the efficiency both from the perspective of the university and getting information out there, and efficiency for the users.*

However, there is a sequence of applying these two criteria. During the Web site evaluation, if two activities are recorded in the same level in the Web Site Evaluation Form 4 and have the same amount of information supporting them, then the one supported by more interactive features is ranked higher than the other. Prioritising the OCAs being supported by the Web site is based on the measurement of informativeness first and interactivity second. This is because most interviewees believed that providing information is the most important purpose of the Web site. In addition, one Web Manager agreed that the content of information is more important than flashy techniques including interactive functions. This is one of the reasons why providers concentrate on informativeness more than interactivity and try to make the Web more interactive gradually rather than suddenly. This idea also matches the history of Web site design that started from providing information first and moved to adding the interactive communication features.

Consistency is concerned with how consistent the Web pages are. This is used specifically to evaluate how well the Web site supports the "increasing the branding" activity. There are at least two different ways to evaluate how well the Web site supports the university brand.

The first is by checking whether the Web site's look and feel is consistent with the print style. Print style means the logos and colour patterns which appear on printed materials of the university. Many other interviewees also suggested this. For example, two interviewees revealed:

> *…branding, whether following along with design from the prints, which is of the most concern to them…The design should be consistent with the style of the print material.*

> *We made that Web site, we tried to align the look and feel to the look and feel of our print publications by using similar design elements, by using some of the same photographic that was used.*

The second way is to measure how consistent the Web pages are across the whole Web site. Other interviewees also supported this suggestion. For example, two interviewees revealed:

> *We try to use all those colours on all corporate pages of the Web site. We also encourage other departments to set their Web sites below the corporate Web site to use the same presentation.*

> *…the shift to design some templates for University D's Web site, main Web site, and then also some templates that all different departments could use, try to be consistent, the branding, things like that.*

As mentioned by another interviewee, without a consistent design across the Web pages and sub-sites, users can feel that they are in a different organisation when they find that a sub-site is not similar to the previous one. This damages the brand of the university:

> *So, when you go from here to there, it makes you feel left to a different organisation, very bad.*

Since this research focuses on evaluation of the Web sites only rather than both the Web sites and print materials of universities, the second way of evaluating how well the Web site supports the "increasing the branding" activity has been chosen.

In summary, informativeness, interactivity, and consistency are three criteria which are necessary for Web site evaluation from the provider's perspective. Those criteria from the user's perspective, such as how easy it is to find the information or how attractive the image is, are not covered in this thesis. However, one clarification that has to be made here is that measuring the performance of the Web sites is different from evaluating how well the Web site supports the OCAs, although both are evaluation from the provider's perspective. This was identified in the interview with one interviewee. He believed that the number of hits is an important measurement for evaluating the performance of the News sub-site:

For news, it is important to measure hits, but not necessarily for others.

Sub-sites with high performance, for example, those with a large number of hits, do not necessarily support certain OCAs well. In other words, the sub-site does not generate hits to support OCAs. The number of hits is an outcome, not a criterion to evaluate how well the Web site supports the OCAs. For example, a News sub-site may have a large number of hits, making it a successful sub-site. However, this is no clearly evidence to show that the provider intends to use this sub-site to support any activity. In contrast, if the sub-site contains information and sophisticated communication features relating to the "retaining staff" activity, it shows that the provider intends to use this sub-site to support this activity more than other sites.

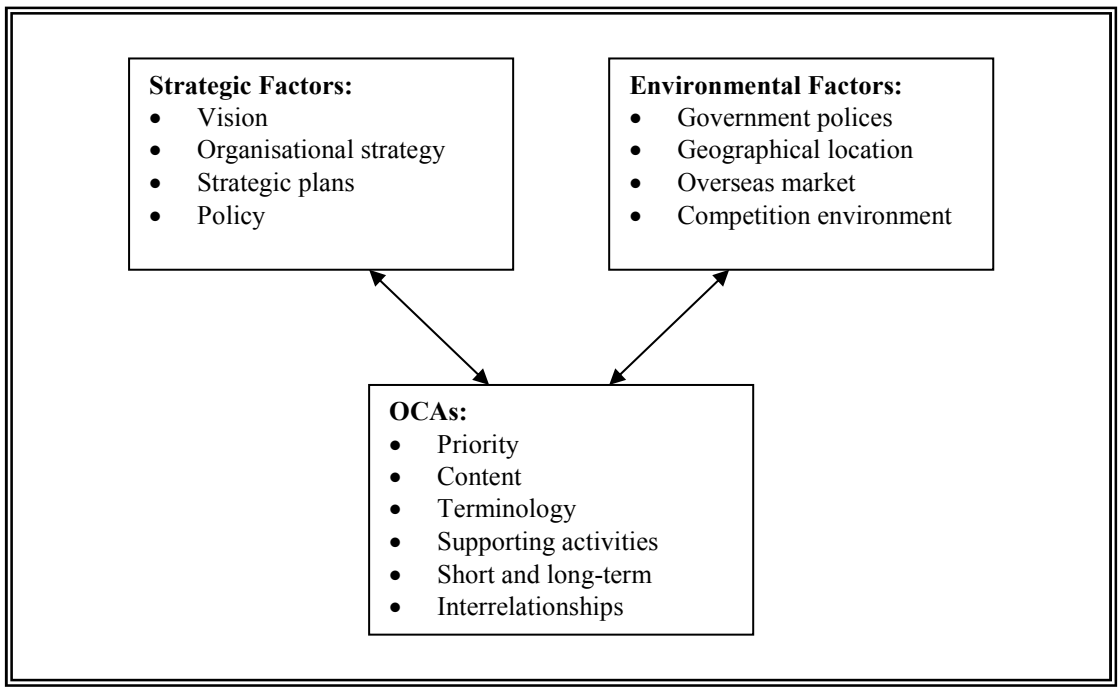
6.3 Lessons Learned about OCAs

The lessons learned about understanding the notion of OCAs form three major parts in this thesis. The first is how the results analysed from the case studies confirm or extend the conceptual model proposed in Section 2.1.2 for understanding the notion of OCAs. The second includes the meanings of various levels of critical activities. The third is the explanation of why variant views on OCAs do exist among management.

6.3.1 Confirmed and extended model

The results analysed from the case studies confirm the conceptual model proposed in Section 2.1.2, which can be used to understand the notion of OCAs. The interrelationships do exist between OCAs and organisational strategic and OCAs and the environment in the proposed model. Nevertheless, the results also depict an extended model which can be used to understand the notion of OCAs in a profounder extent. This extended model is shown in Figure 6.1.

Figure 6.1 *Extended model for understanding the notion of OCAs*



In comparison, the organisational strategies stated in the top left box in the conceptual model are further understood by three strategic factors in this extended model. The environment stated in the top right box in the conceptual model is also further understood by four environmental factors. The bottom central box in Figure 6.1 shows four extra characteristics about OCAs, which are terminology, supporting activities, short and long-term, and interrelationships. The following sub-sections will discuss this extended model in detail.

6.3.1.1 Four strategic factors

As suggested in the proposed model, the strategic management literature shows that organisations adopting different typologies should have different lists of OCAs. The

results of the case studies have confirmed this. Several interviewees pointed out that the OCAs can be derived from their organisational strategies. For example, one interviewee considered that organisational strategy is higher and will affect how they conduct their OCAs. Another interviewee argued that the OCAs are related to their strategic plan. Thus, the strategic factors, for example, what strategy they are acting or what is specified in the strategic plan, impact on how universities prioritise their OCAs.

Not only the strategy and strategic plan, two more factors have been found which have impacts on conducting OCAs according to the results from the case studies: the vision and the policy. The vision is higher than the strategic plan, while the policy is lower in terms of the impact made on the university. The higher level the factor is, the more effect and control it will make to the university. University E is the best example to demonstrate why these factors have effects on OCAs and how they are interrelated. One staff member at this university has identified three new visions. As he mentioned, these visions can be translated into OCAs, however they are not activities:

> *The university under the new Vice-Chancellor has developed the new vision, which defines certain critical attributes, but not activities... they have to be translated into particular activities.*

Another staff member also said that they need to identify these activities which can help them achieve their visions:

> *I've got a whole range of specific action that we need to follow through in order to be able to deliver excellent… So, over the next few years, we will be putting place activities that let us to achieve all of those objectives.*

The vision does have an impact on the priority of OCAs of this university. As revealed by one staff member, they have shifted some focus from the "developing research" activity to the "facilities management" activity in order to achieve their new visions:

> *Within the last two years, probably the emphasis on research because of the PBRF examine ... Then, with the new university vision, the investment and facilities are going to increase.*

In the lower levels, the policy affects how this university prioritise their OCAs. For example, they set a cap on the number of overseas students. They do not want to recruit more overseas students if the current number reaches the cap. One staff member shared how the policy forces them to focus on the "recruitment domestic students" activity:

> *So, for the moment, I suppose our priority is on recruiting more domestic students, and maintaining the balance more or less as it is. So, if we wish by grow another three or four thousand students, we would hope that three out of every four will be domestic students. One out of four will be international students.*

Thus, the policy affects how universities prioritise their OCAs as well. In summary, the analysis of strategic factors should consider three factors: visions, strategic plans, and the policy of the university.

6.3.1.2 Four environmental factors

The results of this research confirm the interrelationships between the environment and OCAs. Nevertheless, the results show four environmental factors which affect what OCAs universities are conducted by the universities and the priority of these activities. Before the discussion of these factors, an assumption must be made here in order to let these factors have effect on conducting the OCAs. It is assumed that the university needs to and is willing to adopt the change in order to succeed. As one interviewee revealed, if they do not adopt the change, they will go under the performance:

> *...but any institution needs to change because nothing last forever, even major corporations. If they don't adapt to the time and change, and they will go under.*

In other words, those universities who are not willing to adopt change can choose not to assess or amend the conduct of their OCAs and their performance could be reduced. Thus, the premise of considering the effect made to OCAs from the environment factors is that universities must be willing to adopt the changes in the environment and to deal with them for their success. These four environmental factors are discussed as follows.

Environmental factor 1 – government policies

The government policy is the strongest of the four factors in the tertiary education sector in New Zealand. The government plays a very crucial role to influence how universities develop their priorities. There are two examples found from the case studies demonstrating how the changes of policy made by the government could strongly affect the OCAs conducted by all universities in New Zealand. The first was the change in tertiary funding policy.

Through the 1990s, universities were restricted in their enrolment because they could only be granted a maximum amount of funds up to certain number of students. They would not receive more funds if their student numbers were over the limit. They could only grow a certain number of students each year. This restriction has been removed since 1999. Thus, the government pays universities based on how many students they have. However, the government also tightened the other funding policies. Universities, therefore, are in a more competitive environment now, but with less funding. They have to find a way to secure more funding. For example, the commercialisation of research outputs has become more important to one of the universities studied because this is how they get extra funds. One staff member at this university, noted, they are:

> *…. spending more on commercialisation because it is more difficult to get money from the government. It becomes more important recently … I think that's likely to become more important as we go forward.*

Another university also concentrates more on their alumni activities due to the pressure of receiving less and less funding. Through a better relationship with alumni, they can encourage them to supply more funds to the university.

The other change was on the research funding policy. The government has announced the Performance-Based Research Fund (PBRF). Each university will be granted a portion amount of money according to their research performances. The better research performance the university has, the more funds it will be granted. This change certainly has pushed every university into focusing on conducting more research activities, hiring more renowned researchers, and recruiting more postgraduate students as discussed by one interviewee:

> *Previously, it was teaching and students, but I think PBRF has changed that to research... They are going to have more push on postgraduate students, and PBRF will change the way that university markets itself.*

Environmental factor 2 – geographical location

The geographical location is not as strong as the government policy factor because this factor does not affect the priority on the top level of the list of OCAs, but the lower level. Two cases are good examples to demonstrate how the geographic factor can affect how universities conduct OCAs. University E and University H are located in a city near to much larger cities. They both tend to keep students from moving into bigger and more modern cities on the one hand, and try to keep students staying and studying in the universities on the other hand. Because University H has started earlier than University E to spend more money on renewing their buildings, providing better accommodation facilities, and making their campus to be more attractive to students, they can attract more students from other cities and have very high student retention rate (students stay for the next year to continue their studies in the university). As noted by one interviewee, they lost many students to University H:

> *I believe we lose many students to University H, and they are geographically the furthest away. But University H is seen as a good student life style choice. So, this is a quality of education and also a quality of the experience.*

Thus, University E is beginning to focus more on the "facility management" activity than previously and to make the campus become more attractive to students. One interviewee comments:

> *What we have to do here in University E is trying to work closely with the city to market the total of … City E is a good place to be, and this is a good university as well … instead of just saying this is a good university.*

Environmental factor 3 – overseas market

The overseas market is a factor as well. University D is a good example to illustrate how this factor affects the action of OCAs. When the number of overseas students drops, it will have more impact on this university in terms of the tertiary funding they received because they are relatively smaller than most other universities. Thus, how to spend the budget wisely, increasing internal efficiency, and marketing activities become more critical to this university. And these activities will become more critical later while the overseas market is still decreasing:

> *So, we spend a very small amount on marketing, but we spend smarter, and we target our marketing very sharply and also have very good student recruitment. That will become more critical I think in the year ahead when student numbers level out.*

As shown in this example, when the overseas market is dropped, it is logic to assume that universities will place the "enhancing internal administrative efficiency", "financial management", "advertising", and "recruiting international students" activities in the higher priorities.

Environmental factor 4 – competition environment

The competition environment is another environment factor. The change to a new competition environment can have an impact on the OCAs conducted by universities. University A is a good example because it has transformed from a polytechnic to a university recently. Although these two types of institute both belong to the tertiary education system, they are in a different competition environment. While they were a polytechnic, they had strong competition with polytechnics and some private institutions in City A. Thus, the research activity was not crucial. After they became a university, the major competitor is University B. This has changed the competition from how to teach to how to conduct research. The priority of research has increased

dramatically in the priority of their OCAs. Thus, the change of competition environment affects how University A has changed its list of OCAs.

All of the latter three factors can be illustrated by one example from University C. This university has three major campuses in three cities. One staff member commented that, the geographical location has caused the C1 campus to focus more on the student recruitment and retention because they are not in a big city. The C2 campus has to focus more on collaboration of some studies with other education providers in the city because the overseas market in these studies has decreased. If they do compete, none of them will have enough students to obtain enough budget to maintain the facilities supporting these studies. C3 campus has to focus more on marketing in order to compete with other universities because this is a very competitive environment with many other universities located here. This particular example shows that the geographical location, overseas market, and competition environment affect how universities prioritise OCAs.

6.3.1.3 The changing nature of the content and priority

Due to the affect made from previous factors, the content and priority of the OCAs can be changed in order to deal these factors. It is important to make a clarification here that an OCA is the activity which the universities must conduct constantly regardless of whether it is a priority according to the definition. Some interviewees confirmed that these activities are constantly conducted. For example, one interviewee described OCAs as day-to-day operations:

> *But overall, those OCAs are day-to-day operation ones. We will always need them.*

Several interviewees also further suggested that the priority of these activities can be changing, which means an increasing or decreasing. As described by one interviewee, the OCA is always there, but the priority for this activity is changing from time to time:

> *…enrolment is just an increasing activity. It didn't suddenly turn up as a priority. I mean it is always there. Everything before hand, get through into the enrolment and those things, but it just keeps increasing.*

One interviewee mentioned that the "finance management" activity is a constant one, and it will become more important in the near future:

> *We always have to keep an eye on cost, particularly at the moment we are under-resourced, we don't have enough money to operate properly as it should… with the 12 month period, budgets and cost would probably be the major items.*

Another interviewee noted that recruiting students is a constant activity; but because of the PBRF exercise, they have to focus more on the "developing research" activity. Thus, the priority has been changed.

One interviewee also sees OCAs are the constant activities conducted by the university. However, when a particular OCA can assist the university overcome its shortage, the priority is changed. Thus, OCAs are constant activities with a changeable priority.

Not only the priority, but also the content of a list of OCAs is changing. This means that the content in a list of prioritised OCAs is changed. In other words, new constant activities have been recognised as OCAs and have been added into the list, or some are not as critical as before, so could be not recognised as OCAs any more. For example, the commercialisation activity is a new OCA to one of the cases:

> *Teaching and research are always the top priorities. Commercialisation, as I said, is a recent development.*

Thus, the results received from the case studies have suggested that the content and priority of OCAs are changing. This means that a university can choose to add OCAs into its list or delete some or it can change the priority of the OCAs without amending the content. Alternatively, it can choose both options and this allows the university to change the content and the priority of the list of OCAs at the same time.

6.3.1.4 Extra characteristics – terminology and supporting activities

The content of OCAs has to be concerned with both its terminology and supporting activities. The terminology is the name of the OCA which has been nominated by the interviewee while the supporting activity is the lower level of activity which supports

the OCA. For example, the "assuring teaching quality" activity is supported by the activities of academic auditing and evaluation of lecturers.

Ideally, the same terms mentioned by two interviewees should mean the same OCAs and be supported by some major activities. However, the senior management members sometimes tend to nominate a general or a broader activity because they are in a higher level, whereas the low level of management, such as Web Designer, tends to nominate a specific activity or a detailed activity. As pointed out by one interviewee, the range of OCA should be defined:

It depends on how wide or narrow you want me to be.

In addition, some interviewees may use different terms to describe the same OCA. Thus, the OCA Repository is used to normalise the terminologies given by the interviewees.

Although the OCA Repository helps normalise the terms used by interviewees, the same terms given by the interviewees do not mean that the supporting activities for each of them are the same. For example, the interviewees in University A and University H both mentioned marketing as an OCA. Yet, the marketing activity conducted by University A is mainly supported by attracting postgraduate students, while the marketing activity conducted by University H mainly means attracting students from other cities. Another example is that the interviewees from both University A and University B nominated teaching as an OCA. However, it is enabled differently. For University A, they tend to provide industry-linked courses because they were a polytechnic and the market of industrial courses is still their focus. For University B, the teaching is enabled by providing more academically-oriented courses. Thus, the undergraduate students can continue their postgraduate studies more easily after they complete their degrees.

Any OCA nominated by the interviewee is also possible to be supported by other activities in the OCA Repository depending on the meaning given by the interviewees. For example, the "recruiting student" can be divided into the "recruiting domestic students" and "recruiting international students" activities.

As discussed previously, a university can change the content or priority of the list of its OCAs in order to deal with the environment. The case studies also showed that the university can also change the supporting activities only without a change on

the content and priority of the list. For example, one university did not change the priority of teaching after it changed to a university from a polytechnic. Instead, it changed from teaching diploma and certificate levels of courses to degree and postgraduate levels of courses. Thus, it is crucial to be concerned not only with the priority and content of the OCAs which were nominated by the interviewees, but also the terminologies and the activities supporting these OCAs. In order to understand the proper meanings of the terms given by the interviewee and to translate their terms into the terms desired by this research, it is helpful to ask the interviewee to explain meanings of the nominated OCAs and how the university supports the OCAs in the interview, then to utilise the OCA Repository and the Interview Normalisation Principles in the data analysis.

6.3.1.5 Extra characteristic – short or long-term

An OCA included in the list can be either short or long-term. In other words, the priority of the short-term one is changed very often and possibly will be dropped from the list of OCAs while the long-term is not changed frequently. Although the short-term OCA is not in the list, it is still conducted by the university because it is still a constant activity. Many interviewees have confirmed that the difference between short and long-term OCAs existed. For example, one interviewee clarified that these two types of activities are different in terms of the period they are conducted:

> *There are some short-term initiatives the university is facing at the moment to make those fairly very critical. But I think long-term is going to define…sort of…the last ten years…was very devolved … a lot of autonomy ways of doing things…What is going to happen now or to define in the next ten years…*

One interviewee agreed that some activities are required to be concentrated on for a longer period:

> *Those are sorts of activities that the university is taking as long-term perspective to try to reduce its operating cost to handle the decline of student numbers.*

Another interviewee believed that they need to concentrate on some OCAs to achieve desirable returns for a long period:

> *...to increase research output and increase your research income, that's quite substantial investment, and you do not get quick return on that investment. So, your returns are slower to come.*

Some comparisons of the characteristics of a short-term and a longer OCA are:

1. Short-term tends to be a detailed activity while the long-term tends to be a broader activity;
2. Short-term tends to be conducted to solve current problems while the long-term tends to be acted to solve a major problem which has been lasting for a long time;
3. Short-term can be considered as a "constant project" (after certain period, it is no longer a priority in the list, but still running) while the long-term is a "long-term goal" (it can be hardly achieved, thus is required to conduct it with concentrations every year);
4. Short-term usually involves less resource than the long-term;
5. Short-term can help the university gain returns in a shorter period while the long-term helps gain return in a longer period.

As the results show from the case studies, most universities are conducting the same long-term OCAs, but not the short-term OCAs. This is probably because they are all universities in New Zealand. They have to conduct certain OCAs in order to allow them to legally exist. However, each of them has different kinds of environment, strategies, and problems. They still need to conduct some OCAs differently. Thus, differentiating the OCAs into short and long-term is helpful to explain why universities have some common OCAs and some different ones.

6.3.1.6 Extra characteristic – interrelationships

There are interrelationships between OCAs. Some interviewees had difficulty to prioritise their OCAs because they believed that some of these activities are interlinked. Most often, the research and teaching are interlinked, as noted by several interviewees, the teaching in universities should be informed by research. For

example, one interviewee specified that the lecturers in the university should be engaged in not only teaching, but also research:

> *At universities, students are taught by people who are actively engaged in research. So, they write the leading edge of that subject.*

Another interviewee also believed that these two activities have an interrelationship when he was asked what OCAs have interrelationships:

> *Mostly just the first two, teaching and research.*

Thus, the "developing research" and "efficient teaching and learning" are considered as interlinked by the interviewees. Several interlinked OCAs and the interrelationships between them were identified by interviewees. They are shown in Table 6.3.

Table 6.3 *Interrelationships between several interlinked OCAs*

Interlinked OCAs	Interrelationships Identified by Interviewees (Quotes)
Recruiting students (domestic and international) – Developing research	We do postgraduate, we have PhD coming. They are doing the full research line... We've doubled the number of postgraduate students in the last three years.
Recruiting staff – Developing research	We get best possible staff, and those people who will win the research grants, research funds, research students, and they are be able to do the quality research.
Developing new courses – Recruiting students (domestic and international)	But course development is one of the things that will be attractive to students if you are offering the courses the students want to do, and then more likely they will come.
Providing scholarships – Recruiting students (domestic and international)	We also quite interested in attracting well rounded students… One example of that is we have a specific sport scholarship.
Facility management – Recruiting staff	University itself is successful financially, and sustainable and able to provide the best facility for their staff, teaching facility and research facility are able to attract the very best staff.

Overall, there are at least two types of interrelationships between these interlinked OCAs. Firstly, they are interlinked financially. Suppose a university only has certain amount of budget: thus, if the senior management decides to invest more budget onto OCA A, they will have less budget to invest on OCA B. One interviewee has confirmed this type of interrelationship, in particular for two activities competing for the same resources:

Terribly interlinked…Whatever resource we put into one of those, this resource is not available for the rest… If I will do A, I will not do B because I don't have enough money for it.

Furthermore, if the OCA can generate more budget, it will impact on other OCAs. For example, the "recruiting students (domestic and international)" activity has a strong financial interrelationship with the other activities:

And if we don't attract students, then we haven't got the revenue to do the rest of OCAs.

The "financial management" activity can save more budget for the university, which can enable it to invest more budget on other OCAs:

We also put a lot of emphasis on finance at the moment, just because we want to be able to tighten our budget up. So, we position to achieve all these other things. So, it's tricky maybe right now we're focusing on finance, but because it's a key support for all the other things.

Secondly, they are interlinked because one activity supports the others. The existence of this type of interrelationship shows that several OCAs can be possibly integrated as a process if they are supporting each other. For example, one interviewee believed that the "advertising" activity supports the "recruiting students (domestic and international)" activity. Thus, they are in the same recruiting process:

There is recruitment of students… advertising is associated with that, with the recruitment. This is a kind of supporting activity for those, but I put the recruitment down as another organisational critical activity.

Sometimes, the process can be an ongoing loop. One interviewee used the word "cycle" to describe the ongoing process between recruiting research staff, conducting research, commercialisation, gaining funding, and recruiting research staff:

We need to develop our research income stream. We need good researchers, getting contracts, so getting the money, and selling the Intellectual Property. So, it's an ongoing process to get research… This is the cycle.

However, that one activity supports the other does not necessarily mean that they are both in the same process that there is a differentiation of level existing between them. One activity could become supporting activity to the other. For example, one interviewee believed that only teaching and research are OCAs. Other activities are just supporting these two:

> *Marketing is obviously very important… All these things are important, but… they all there as activities that support the most important things we do, which are teaching and research.*

In a summary of the previous discussion, the results analysed from the case studies do confirm the conceptual model for understanding the notion of OCAs proposed in Chapter 2. The results also depict an extended model which can be used to understand the notion of OCAs to a profounder extent. In particular, this extended model can be used by universities to understand how well their OCAs are aligned with the environment and their strategies. They can adjust or develop a list of OCAs with well defined terminologies and supporting activities based on those characteristics of OCAs shown in the model.

6.3.2 Various levels of critical activities

The OCAs discussed in this thesis are critical to organisational success. The results analysed from the case studies also found another four types of activities which are critical to various levels of success in an organisation or in the industry which the organisation competes in: industrial, campus, departmental, and job levels. They are not OCAs discussed in this thesis because they are not critical to organisational success. However, they are the activities which are critical to the success in "some levels". The activities, which are critical to the success in the departmental and job levels, have been termed as Departmental CAs and Job CAs previously in Section 6.1.2. The activities, which are critical to the success in the success in the industrial and campus levels, are termed as industry critical activities (Industry CAs) and campus critical activities (Campus CAs) in this thesis.

6.3.2.1 Industry CAs

Industry CAs are those activities which must be conducted by all the universities in the industry in order to succeed. At least three Industry CAs were identified; research, teaching, and learning. Most interviewees nominated more than one of these as OCAs. Some believed that these are the OCAs common to all the universities in New Zealand. For example, one interviewee believed that teaching and research are two activities which all universities need to conduct:

> *Universities haven't changed that much. The method of delivering is changed, but universities for two or three hundred years have been about research and teaching.*

He also believed that other activities are conducted to support these two activities:

> *Mostly just the first two, teaching and research, our key outputs and key reasons that we exist, and rest of them really are support to those two.*

Furthermore, another interviewee also revealed that teaching, learning, and research should have equal standing:

> *Teaching, learning, and research: they are sort of equal standing.*

One major reason which explains why Industry CAs exist is probably because the government has formed a tertiary education regulation for them. Therefore, they must conduct these activities to comply the regulation. As revealed by one interviewee, these activities are why they exist and in particular the research shows how they are different from polytechnics.

6.3.2.2 Campus CAs

Some universities have more than one campus. Thus, each campus has to conduct its own CAs in order to succeed. The evidence of showing the existence of Campus CAs is not clearly identified in most of the case studies except the case of University C. One possible explanation is that most of the universities in New Zealand are more centralised in terms of the management and location on their different campuses. Therefore, these campuses just follow the OCAs and there is no intention for them to specify the Campus CAs. Yet, University C has a more decentralised managerial style

on its three campuses because these three are located in different cities and competition environments spread throughout New Zealand. The locations and environments have caused the three campuses to undertake different Campus CAs to succeed in their cities. One staff member also commented that the C2 and C3 campuses have a higher priority on upgrading the campus to a better level, while the C1 campus concentrates more on upgrading the campus into an attractive campus which helps recruit students:

> *The C3 campus has been growing at between 10 and 15 percent per year, C2 under 10, C1 static, one year may go up, one year may go down, and they need to spend more money on this campus [C1 campus] because of that. The spending in C2 and C3 has been more about on campus developments, and has been more about bringing the infrastructure up to a better level rather than generate enrolment.*

These words also show that the OCA of "providing student services" can be possibly translated into the Campus CAs in different forms – providing a better campus or an attractive campus. The case of University C shows that the university has a diversified campus physically and decentralised management style may need to create different Campus CAs to deal with various competition environments.

6.3.2.3 Departmental CAs

Universities consist of various departments in a range of disciplines. Each department (can be either academic or functional department) has certain activities which are critical to enable its success. They are Departmental CAs. The "developing new courses" activity is sometimes the Departmental CA mentioned most often by interviewees. This is because the competition between two universities is not usually from the university level of areas, such as the reputation of the university: it is more from the competition between the departments which are located in two different universities. In order to compete, the universities, therefore, tend to devolve the task of identifying new programmes to departments:

> *A lot of the way the things often work in university is the direction that set in high level and the individual unit perhaps division, the schools, is*

sort of delegated up to them to define how it is, they have reset the course to meet the direction.

As revealed by one interviewee, departments also need to define other Departmental CAs and the Chairperson of Department should be in charge of these activities and invest in them in order to succeed:

But if you want to grow the strength and department strategic planning or marketing or whatever in management that will be the Chairperson of Department strategically identifies that area and saying right, that's what we are going to invest them.

6.3.2.4 Job CAs

Job CAs are the activities which are critical and conducted constantly to achieve the success of a personal job. As one interviewee noted, this type of OCA is different from the OCA discussed in this thesis because they are the lower level of activity:

In my area, research, particularly finding and securing external research funding. That's what my team really does. When you start to go up to the macro level of the university, you sort of get back those teaching and learning sides. I don't have a lot of knowledge about that. Which one do you want me to focus on?

Examples of Job CAs include the activities of maintaining the relationships with the government for the Vice-Chancellors, sustaining and controlling the marketing budget for Marketing Managers, and developing the IT plan for the ITS Director.

6.3.3 Reasons to explain variant views on OCAs

The interviewees were given one definition of OCAs in each university. Thus, these interviewees should be able to identify the same lists of OCAs in terms of the content and priorities. The results derived from the case studies show that it is hard to identify a coherent view from the management. The variant views exist between different management levels and even within the same management team. There are several reasons to explain why this occurs.

The first one is that the senior management does not know much in the detail of OCAs, while the lower level management does not care for the emphasis from the senior management. Therefore, the senior management tends to nominate those "broad" activities as OCAs, such as teaching and learning. They are sometimes unable to identify lower level activities under the categories of these "broad" activities. As one interviewee shared, he cannot know too much detail because his level is quite high. In contrast, the lower level management sometimes does not care about what OCAs are discussed in the senior management and also cannot know about them. This was frequently found when interviewing the Web team members. Thus, these two levels have variant views on the OCAs.

The second explanation is that the senior management team is responsible for monitoring what OCAs they should be enacting whereas these activities are conducted in the lower level of management. Therefore, the lower level of management only needs to know what detailed activities they should be conducting rather than what the OCAs should be conducted. As one interviewee commented, it is normal to have a variant view in the lower level management, particularly in a big organisation like university. Yet, the directors should have the proper view on the strategic direction in order to enable them to supervise their staff onto the right track:

> *But again why do you have directors? They are directing the activities underneath them. The directors are directing the activities the way to support that particular plan. So, whether the people underneath the directors know about the top level plan or not, it doesn't matter.*

The third explanation is that the management members nominated a list of OCAs according to different bases. This, in particular, can explain why the variant views even exist within the same management team although the members in the same team discuss their plans and various kinds of activities regularly. There are two groups of bases identified here. They are the bases from the definition and the bases from the interviewee's personal interpretation.

The first group of bases is the characteristics in the definition of OCAs, for example, significant resources, and received senior management monitoring. After the interviewees are given the definition, they are supposed to identify the activities which fulfil all the characteristics in the definition. However, they may emphasise one

particular characteristic more than another or they believe the OCAs should be identified based on only one or two characteristics. Therefore, they have nominated different OCAs.

The second group of bases is their personal interpretation of the meaning of OCAs. This occurs when the interviewee cannot identify any OCA which matches any characteristics in the definition. Under such circumstances, the interviewee will make a nomination based on the particular characteristics which they believe the OCA should have. Three characteristics are often referred by interviewees:

1. To fulfil basic requirements;
2. To strengthen its weaknesses;
3. To solve a problem at a particular time.

Some interviewees believe that OCAs are those activities which should be able to fulfil basic requirements of the existence of a university. For example, one interviewee gave a list of OCAs according to the pillars that are supporting the university's existence. He believed that the nominated OCAs are those activities which can differentiate themselves from a polytechnic:

> *The other major effort we are taking as OCA is research… And, of course, all of our teaching staff is required to do research. We say that's the difference between a university and polytechnics.*

Some interviewees perceived those activities which can help the university strengthen its weaknesses, as OCAs. For example, one interviewee revealed that they are more focused on research at the moment because this is the weakest part to them and they have a longer journey to go in the future. Thus, it is a very important OCA now. Another interviewee from the same university also revealed they will spend more money on research because they need to improve it:

> *Probably in research, we've got to catch up a lot.*

Several interviewees interpret OCAs as the activities which enable the university to solve a problem at a particular time. For example, one interviewee believes that the activity of providing student accommodation services is critical since 2000 because

they had a dramatically increased number of students, thus, they have to provide more student accommodation services:

> *Certainly accommodating expansion is critical, I think it's been critical particular since 2000, our number began certainly to go up. So we have to divert, we have to increase our capital budget to accommodate that and divert a quite portion of that capital budget to new building.*

Previous discussions have shown that the variant views of the recognition of OCAs do exist among management because of different interpretations of its definition. Because there is little knowledge of the notion of OCAs, these explanations are valuable for understanding the nature of the OCA and developing a proper definition for it.

6.4 Lessons Learned about Developing the OCAWSEM

Many lessons have been learned from the case studies conducted in the OCAWSEM Developing Process. These lessons are useful for developing other kinds of OCAWSEM that can be used in other industries.

Firstly, it is crucial to understand that the Organisational Provider perspective should be adopted when developing the tools for evaluation of the support given to OCAs from Web sites. This research shows that the development of these evaluation tools from the business perspective is different from those which are developed from the user or customer perspective. As discussed in the Literature Review, the Web site evaluation from the user or customer perspective is based on the satisfaction of user or customer on a range of criteria. For example, an evaluation concerns whether users is satisfied with the information contained in a Web site in terms of usefulness in introducing product information. Thus, the process for the development of the methodology should require user's involvement. In contrast, the Web site evaluation from the organisational provider's perspective does not seek user's involvement.

Secondly, it is crucial to interview the management in a particular industry in order to elicit the specific OCAs which are being conducted in that industry. In universities, the "recruiting domestic students" and "recruiting international students" are two OCAs nominated by interviewees. However, these two activities may be

described differently in other industries, such as domestic and overseas marketing. Thus, the OCA Repository should be modified according to the terms nominated by the management.

Thirdly, as the Developed OCAWSEM seeks to evaluate how Web sites support the objectives of the organisational provider rather than the user or customer, accordingly, the criteria of Web site evaluation from the organisational provider's perspective are different from those criteria employed when adopting the user's perspective. This research has found that informativeness, interactivity, and consistency are three criteria which should be adopted when developing the OCAWSEM.

Fourthly, it was found in this research that the manual approach is more appropriate than the automated approach for Web site evaluations. On one hand, the evaluator has more opportunities to study deeper into the information contained in the Web site. The analysis is based on the observation of the information itself rather than on the processed information (e.g. statistic information). On the other hand, the manual approach also allows the evaluator extract any new OCA which is not mentioned by the management or within the OCA Repository. However, when choosing the manual approach to evaluate a large Web site one difficulty should considered, that is, a vast amount of time being spent on evaluating every single Web page manually. Evaluation on the "topic" and "community" of the sub-site level is a solution.

Fifthly, the assessment and discussion of the overall support, which is based on the qualitative dimension level, allows universities to monitor what OCAs are being supported effectively and efficiently by Web sites. Then, universities can know what areas should be improved, through what Web projects, in what priority. Thus, adopting this approach should be considered to develop the OCAWSEM to serve as a diagnostic tool. Furthermore, the Overall Support Display Diagram utilised in this research can be a useful tool to present the current support practices of the university and how they can improve the Web site for better support. It is suggested that the Overall Support Display Diagram also should be utilised if the OCAWSEM plays a role as a diagnostic tool.

Sixthly, a series of case studies based on the ICD should be conducted in order to improve and test the OCAWSEM. In terms of the ICD, it is a multiple-case based

design. A reflection stage is necessary to be conducted in the end of each case in order to identify what parts of the OCAWSEM have performed poorly and should be improved. In this research, the number of cases is eight and this is the total cases in the university industry in New Zealand. In regard to some industries, it would be unrealistic to study all cases if there are thousands of cases in the industry. Thus, determining when the iteration process of the case studies should be stopped needs a judgement made from the researcher at the end of every case in terms of the amount of knowledge generated (e.g. whether enough fruitful lessons have been learned) and the quality of the OCAWSEM (e.g. whether the OCAWSEM is valid and reliable to a desired level).

Lastly, the quality of the OCAWSEM should be assessed by the criteria of validity, reliability, usability, extensibility, and adaptability. As discussed in Chapter 5, the Developed OCAWSEM produced by this research ranks high on each of the five assessment criteria. Chapter 5 also provides suggestions for how the Developed OCAWSEM can be extended and adapted to other environments. Thus, developing a new OCAWSEM based on the current Developed OCAWSEM is a more efficient approach to achieve high rank on the five criteria more easily than the approach which is not based on this. Moreover, utilising guidelines, principles, and forms provide a systematic way to enhance the quality of the OCAWSEM.

6.5 Chapter Summary

This is the last chapter presenting the research results of this thesis, which has presented the lessons learned from the eight case studies. The lessons learned both from the interviews and the Web site evaluations have been presented.

In terms of the interviews, the lessons include how the situations can be dealt with when the interviewee cannot nominate any OCA and cannot prioritise the nominated OCAs; some common mistaken answers related to OCAs; and the types of interview questions should be utilised in the interviews.

In terms of the Web site evaluations, the lessons include how to deal with a range of difficulties faced when evaluating the Web content and features, judging and counting the sub-sites, and dealing with the Web structure during the Web site evaluation process. These lessons also confirm that the evaluation perspectives can be

from the provider or user, and informativeness, interactivity, and consistency should be adopted when evaluating how the Web site supports OCAs from the organisational provider's perspective.

This chapter also presents the lessons about OCAs and developing the OCAWSEM. In terms of OCAs, this research not only confirms the conceptual model for understanding OCAs, but also proposes an extended model, finds additional levels of OCAs and justifies the reasons for variant views among management on OCAs. These lessons can be used to understand the notion of OCAs in a profounder extent. Finally, this chapter presents the lessons which can be helpful in developing an OCAWSEM to be used in other environments.

CHAPTER 7

CONCLUSION

The presentation of this thesis now reaches the conclusion. In this chapter, Section 7.1 will provide a brief review of previous chapters. Section 7.2 will present the findings which are relevant to answering the four research questions. Section 7.3 will discuss the limitations of this research both of the research design and of the research framework. Section 7.4 will show five streams of potential future research which have been identified from this research. This thesis closes by identifying its contributions to both academics and practitioners in Section 7.5.

7.1 Review of the Thesis

The central focus of this thesis is to develop an evaluation methodology which can be utilised to evaluate the support given to "Organisational Critical Activities" (OCAs) by Web sites. OCAs are those activities which are critical to an organisation's success.

Because the support given to OCAs by Web sites helps organisations achieve their success, it is necessary for organisations to have an effective evaluation methodology which can help them evaluate such support.

Chapter 1 identified four research questions in regard to the development of this methodology. These four questions are:

1. What kinds of activities are OCAs in organisations and what is a proper description to define these kinds of activities?
2. How can OCAs be identified, and what methodology and sources can be used?
3. Supposing an OCA in an organisation is identified, how can the organisation's Web site be evaluated in terms of how well the Web site supports the OCA? What methodology and tools can be used?
4. How can the overall support made to an organisation's OCAs from their Web site be discussed? How can the results be translated into useful suggestions to improve the Web site and what framework and method can be used?

After Chapter 1, the next five chapters presented how this research dealt with these questions. Chapter 2 reviewed relevant literature and found that the literature did not answer these questions in full. Four research objectives were defined in order to answer the questions in full. To achieve these objectives, a prototype "organisational critical activity Web support evaluation methodology" (OCAWSEM) was developed based on the literature, but to enhance its quality, this methodology needed further development and testing. Chapter 3 discussed what proper research paradigms and methodologies were appropriate to develop and test the Prototype OCAWSEM. A research framework outlined how this research utilised all universities in New Zealand to develop the Prototype OCAWSEM into a Developed OCAWSEM, and to test the quality of the Developed OCAWSEM.

Chapters 3, 4, and 5 are the chapters presenting the results of the developing and testing. Chapter 4 presented the improvements made to the Prototype OCAWSEM in seven Developing Case Studies, while Chapter 5 provides the results of testing the Developed OCAWSEM in the Testing Case Study. Finally, Chapter 6 presented useful lessons which were learned in all case studies.

7.2 Summary of Research Findings

This research generates a number of useful findings. They are summarised in this section. Their presentation is based on the research findings relating to each of the four research questions proposed in Chapter 1. Several extra findings will be also presented in the end of this section.

7.2.1 Findings relating to Research Question 1

The first research question is:

> ***What kinds of activities are OCAs in organisations and what is a proper description to define these kinds of activities?***

The findings relating to this research question are summarised in Table7.1.

Table 7.1 *Summary of findings relating to Research Question 1*

Sub-questions in Research Question 1	Summary of Research Findings
What kinds of activity are OCAs?	The activities which share these characteristics: • constantly conducted; • organisational priorities; • significantly resourced; • discussed, managed, and monitored by senior management regularly; and • critical to organisational short, medium, and long-term success. Some examples for the universities in New Zealand are shown in the OCA Repository.
What is the proper description to define this kind of activities?	An organisational critical activity is an organisational priority that is recognised as being essential to short, medium and long-term success in that industry, has been significantly resourced, and receives regular senior management monitoring and direction

At the start of this research, the single key characteristic of an OCA was that it is a constantly conducted activity. This view has been enhanced through this research. Table 7.1 shows that OCAs are activities which share more than the characteristic of being constantly conducted. They also have the characteristics of: having organisational priorities; being significantly resourced; being discussed, managed, monitored by senior management regularly; and being critical to organisational short,

medium, and long-term success. These new characteristics help us understand what kinds of activities are OCAs and how can we define and describe them.

The "organisational priority" shows that the OCA studied in this research is an activity which is critical to the organisational success rather than to the departmental, functional, or job-related success. This shows that the OCAs discussed in this thesis are different from the concept of critical success factors (CSF, e.g. Butler & Fitzgerald, 1999; Gadenne, 1999; Lee & Cata, 2005; Rockart, 1979; Sabherwal & Kirs, 1994).

Although most OCAs are conducted at the organisational level, this research does not rule out the possibility that an OCA is conducted at departmental, functional, or personal job levels. A departmental, functional, or job level activity still can be an OCA as long as the interviewees nominate it as an OCA and provide justification to prove that this activity is also critical to the university's success. Furthermore, this activity must be "significantly resourced". These characteristics are useful in identifying OCAs both in the data collection and analysis stages.

The term "short, medium and long-term success" shows how essential OCAs are to the university's success. An OCA enables not only short and medium-term success, but also long-term success. The reason is that an OCA is constantly conducted. When considering that an OCA enables success and is being conducted constantly, it is reasonable to assume that an OCA enables success constantly, and thus enables long-term success. Moreover, the term "receives regular senior management monitoring and direction" is used to reinforce the OCA as an organisational priority which is conducted constantly.

These new characteristics have been utilised to improve the definition of an OCA. The modified definition was "an organisational priority that is recognised as being essential to short, medium and long-term success in that industry, has been significantly resourced, and receives regular senior management monitoring and direction". This definition should be employed when eliciting OCAs from management.

This research also found that OCAs are not limited to those generic value-added activities included in Porter's (1985) value chain. OCAs can be the activities which are particularly conducted in a specific industry. For example, the activity of "efficient teaching and learning" is an OCA in the university industry. This research

has developed an OCA Repository which lists 33 OCAs of the universities in New Zealand. While some of them were confirmed by interviewees as OCAs, some were not. However, those activities in the repository which were not confirmed in this research still could be the OCAs to the universities in other countries or to the organisations in other industries. Nevertheless, a researcher who employs this repository should realise that it is a repository of OCAs nominated by the interviewees, rather than a complete and inextensible set of OCAs.

7.2.2 Findings relating to Research Question 2

The second research question is:

> ***How can OCAs be identified, and what methodology and sources can be used?***

The findings relating to this research question are summarised in Table 7.2.

Table 7.2 *Summary of findings relating to Research Question 2*

Subquestions in Research Question 2	Summary of Research Findings
How can OCAs be identified?	OCAs can be identified in two ways: 1. Analysing the strategic and environmental factors 2. Communicating with the management
What methodology and sources can be used to identify OCAs?	• For communicating with the management, the self-typing approach, semi-structured interviews, the Interview Guide, and the lessons learned about eliciting OCAs from interviews should be utilised. In particular, senior management should be interviewed. • For analysing the strategic and environmental factors, the final proposed conceptual model by this research should be utilised.

Table 7.2 shows that there are two ways to identify OCAs. One is analysing the strategic and environmental factors, and the other is communicating with the management. Each way requires different methodology and sources. These two ways confirm what has been hypothesised in Section 2.2 that the external assessment and self-typing methods (Snow & Hambrick, 1980) could possibly be used for eliciting OCAs. The strategic management literature (e.g. Chan et al., 1997; Miles & Snow, 1978; Mintzberg, 1978; Porter & Millar, 1985; Venkatraman & Camillus, 1984; Venkatraman et al., 1993) seemed to suggest a conceptual model (see Section 2.1.2) to identify OCAs by analysing the interrelationships between OCAs and the

organisational strategies and the environment of the university. Results of this research support the existence of these interrelationships. The results also extend the conceptual model into a richer model. It was found that the organisational strategies can be derived from strategic factors including the vision, strategic plans, and policy whereas the environment can be assessed by four environmental factors including government polices, geographical location, overseas market, and competition environment. This research found that these two groups of factors influence the content and priority of the list of the OCAs which are being conducted by universities.

This research confirms that the self-typing (Snow & Hambrick, 1980) is an appropriate method of capturing the viewpoints from the management, and particularly on what OCAs they think that they are conducting currently. The analysis of the secondary data can be weak in identifying up-to-date OCAs. This research argues that it is more likely those OCAs identified from the secondary sources (e.g. strategic documents), particularly their priority, are out of date. This is because universities may change the priority of the OCAs rather the content of the OCA list in order to deal with the environment or to support their strategies. Because of this, it is appropriate to utilise the secondary data to triangulate the OCAs currently conducted by the university.

As discussed in Section 2.2.3, the semi-structured interviews are capable of eliciting organisational strategies from the management (e.g. Broadbent & Weill, 1991; Broadbent & Weill, 1993; Chan, 2002; Pyburn, 1983; Reich & Benbasat, 1996; Reich & Benbasat, 2000; Schneider et al., 2003). As hypothesised, semi-structured interviews were able to be used in this research elicit OCAs from the management, while exploring the notion of OCAs at the same time. The results of this research support this hypothesis.

Furthermore, this research also finds that semi-structured interviews are more appropriate than the other two methods which can be also categorised as the self-type approach – the survey (e.g. Chan et al., 1997; De Vasconcellos & Hambrick, 1989; Sabherwal & Chan, 2001; Sethi & King, 1994; Teo & King, 1996; Zviran, 1990) and Delphi technique (e.g. Gokhale, 2001; Huang et al., 2004; Lai et al., 2002; Luftman, 2000; Madu et al., 1991) in terms of eliciting and exploring. The survey method is inappropriate to this research due to the difficulty of exploring the notion of OCAs. Another reason is that some of the interviewees can only give a list of OCAs after

they received further elaborations of the meanings of OCAs from the interviewer. The survey method cannot achieve such interactive communication between the researchers and participants during the process of eliciting OCAs. Thus, the survey method is not appropriate when the researcher feels that the participants are unlikely to be able to nominate OCAs properly. Yet, it could be adopted because of the efficiency concern if the researcher is sure that those participants can fully understand the meanings of OCAs or the organisation has an explicitly stated list of OCAs with which the participants are familiar.

The Delphi technique (e.g. Gokhale, 2001; Huang et al., 2004; Lai et al., 2002; Luftman, 2000; Madu et al., 1991) is not recommended for generating a list of OCAs from a large number of staff members. It is more useful when eliciting OCAs from a small group. In addition, this technique would compromise the variant views on the OCAs between interviewees. This research tends not to ignore the variances on the views; otherwise, it would be difficult for the organisation to diagnose itself on whether its management has a coherent view on OCAs. This technique can be utilised to create a shared view of the OCAs among a small group (e.g. the senior management team) instead of developing a diagnostic tool examining the views of a large group.

This research also finds that the senior management has a strong power to direct the content and priority of OCAs of the university. Therefore, interviewing the senior management is necessary for eliciting OCAs. The Developed OCAWSEM has reflected this by granting higher scores to the OCAs nominated by them.

The senior management has a strong influence on OCAs, so should be interviewed when eliciting OCAs. However, the results show that the senior staff members usually have diversified views on the OCAs. More confirmations are still needed to examine which are the OCAs actually conducted. Thus, both the senior management and other levels of management should be interviewed in order to triangulate the answers when eliciting OCAs.

More than one interview question should be employed when eliciting OCAs. Ideally, there should be only one interview question asked because all staff members should give the same lists of OCAs. The question is "What are the OCAs in the university and what is their priority?" In reality, as found in the eight case studies, it is almost impossible to pose only this question. Since the notion of OCAs is new, the

universities do not produce any document showing a list of OCAs which the university is conducting. It is difficult for some of the staff members to nominate a list of OCAs. Thus, more interview questions are necessary to elicit OCAs.

In regard to the interview questions, the OCAWSEM proposes the Interview Guide which can be utilised in the semi-structured interviews. It includes both the definition of OCAs and interview questions. The interview questions are two types – Formal Interview Questions and Interactive Interview Questions.

The Formal Interview Question typifies the interview question which is crucial to elicit OCAs from management and must be asked during the interview. In addition to the question of asking the interviewee to nominate a list of OCAs, this research has added other Formal Interview Questions to the Interview Guide including those questions which can refresh the interviewee's mind on the relevant strategic context of the university in order to nominate OCAs more easily. There are two purposes for posing these newly added questions. One is to help interviewees nominate Explicit OCAs more easily, and the other is to elicit Implicit OCAs from the interviewee's responses on the strategic context.

The Interactive Interview Questions are also helpful in eliciting OCAs in the interviews. They should be posed on five occasions. The first occasion occurs when asking how the university defines its success, and some interviewees indicate that they were not sure of how the university defines its success. The Interactive Interview Question encourages the interviewees to give their answers based on both their understandings and feelings about how the university defines its success.

The second occasion occurs when given the definition of OCAs, and interviewees reply that they do not understand this definition and are unable to nominate any OCA. The Interactive Interview Question asks the interviewee to consider the messages coming down from the senior management team and identify the important things, top priorities, and things concentrated on in the university.

The third occasion occurs when the interviewees have difficulties in answering how the university supports and enables the OCAs. The Interactive Interview Question asks the interview to think about how the university supports the OCAs specifically and differently from other universities.

The fourth occasion occurs when it is necessary to check whether the OCAs, which the interviewee nominated, are correct. Two Interactive Interview Questions

should be posed. One is “does the senior management team discuss them regularly” The other is “does this university spend a lot of resources on them”.

The fifth occasion occurs when the interviewees cannot prioritise the list of OCAs they have given. One Interactive Interview Question should be posed to them to ask about what is discussed regularly, resourced significantly or emphasised most by the senior management. If they still have difficulties in answering this question, simply ask the interviewees about their feelings.

Two groups of lessons have been learned to help elicit OCAs in the interviews. Firstly, three scenarios were found when the interviewee was unable to nominate a list of OCAs – they did not remember the definition of OCAs, they did not know any of OCAs, and they did not understand the meaning of OCAs. Repeating the definition of OCAs is useful when the interviewee does not remember the definition. If the interviewee does not know any of OCAs, ask what he or she feels is the message or emphasis coming down from the senior management team or higher level of management. Three terms are able to assist the interview to nominate OCAs if he or she does not understand the meaning of OCAs, which are important things, top priorities, and things concentrated on. However, another four terms, which are competency, strength, excellent area and important project, should be avoided because they will elicit answers other than OCAs.

Secondly, some interviewees nominate a list of items which are believed to be OCAs, yet, but which are not. While previous situations are that interviewees have a problem in answering a question, this situation is that they not give proper answers. Most commonly, these proper answers are Departmental CAs, Job CAs, or critical projects. The researcher should try to discern these inappropriate answers, ignore them and then to seek to the proper ones during the interview in the future. However, if due to any practical circumstances, that the distinction is unable to be made during the interview, for example, the time disallows having more questions, the researcher should employ the Interview Scoring Principles provided by this research to deal with these inappropriate answers during the data analysis of the interviews.

7.2.3 Findings relating to Research Question 3

The third research question is:

How can the organisation's Web site be evaluated in terms of how well the Web site supports the OCA supposing an OCA in an organisation is identified; and what methodology and tools can be used?

The findings relating to this research question are summarised in Table 7.3.

Table 7.3 *Summary of findings relating to Research Question 3*

Subquestions in Research Question 3	Summary of Research Findings
How can a Web site be evaluated in terms of how well the Web site supports the OCAs?	The Web site can be evaluated according to the Stages 4 to 7 of the Evaluation Process Instructions provided in the Developed OCAWSEM. These include: • Investigate Web Background; • Confirm and Generate Organisational Critical Activities; • Analyse Effectiveness and Efficiency, and • Grouping stages. In particular, the criteria informativeness, interactivity, and consistency should be adopted.
What methodology and tools can be used to evaluate the support?	These tools should be used: • the Evaluation Process Instructions for Stages 4 to 7 and the Web Evaluation Framework (includes OCA Repository, Web Site Evaluation Forms); and • the lessons learned about Web site evaluations.

Table 7.3 shows that the Evaluation Process Instructions of Stages 4 to 9 included in the Developed OCAWSEM and the Web Site Evaluation Framework should be adopted to evaluate how effectively the Web site supports the OCAs. This confirms what Hung and McQueen (2004) suggested, in that utilising evaluation forms can provide a systematic way to evaluate Web sites. In addition, the lessons learned about Web site evaluations in this research also provide help. More details about these findings are summarised below.

In terms of the instruction, the Web site evaluation comprises four stages – Investigate Web Background, Confirm and Generate Organisational Critical Activities, Analyse Effectiveness and Efficiency, and Grouping. The functions of these stages are:

- Investigate Web Background: This stage aims to familiarise the evaluator with the Web site domain in terms of what sub-sites are Internet, intranet and extranet enabled, and the intended user groups.

- Confirm and Generate Organisational Critical Activities: This stage supplies a systematic evaluation process which guides the evaluator to assess the hyperlinks and sub-sites from the Homepages of Internet, intranet and extranet in order to seek how much information the Web site supports each OCAs in the OCA Repository and any new OCA which is not listed in the OCA Repository.
- Analyse Effectiveness and Efficiency: This stage requires the evaluator to discuss how effectively and efficiently the Web site supports the OCAs listed in the OCA Repository by converting the results derived from the stage of OCAs Confirmation and Generation into "levels". The descriptions of the levels can be found in Appendix 2.
- Grouping: This stage aims to categorise the OCAs listed in the OCA Repository into five categories based on the results derived from previous stages. These five categories are the activities which are effectively and efficiently supported, effectively or efficiently supported, generally supported, poorly supported and non-supported.

Through these four stages, the evaluator is able to evaluate a complex Web site on how well it supports OCAs.

The OCA Repository is a helpful tool to assist the efficient Web site evaluation. Since a complicated Web site may contain more than one thousand sub-sites and support hundreds of activities, it is insufficient to examine whether each one of these supported activities is an OCA. By referring to the OCA Repository, evaluators can evaluate the Web site efficiently. Through a series of adding, renaming, merging, and dividing activities, the OCAs listed in the OCA Repository have been expanded from 29 to 33. In addition, this research suggests that a specific OCA Repository should be developed based on the specific OCAs conducted by the organisations in a particular industry in order to assist the evaluation on the Web sites in that particular industry.

In terms of Web Site Evaluation Forms, there are five forms developed in this research which each has specific functions. The Web Site Evaluation Form 1 can be used by the evaluator to become familiar with the overall structure of the Web site through identifying what sub-sites are in the Internet, intranet, and extranet domains.

The Web Site Evaluation Form 2 requires the most time in comparison with filling out other forms because of the evaluation of a significant number of sub-sites. The Web Site Evaluation Form 3A summarises and interprets the results produced from Web Site Evaluation Form 2 into a meaningful manner in terms of how effective and efficient the Web sites are that support the OCAs. The principles for the summarising and interpreting are contained in the Web Site Evaluation Form 3B. Based on the results produced from Web Site Evaluation Form 3A, Web Site Evaluation Form 4 groups the OCAs supported by the Web site into categories.

There are some useful lessons learned in terms of Web site evaluation in this research. Firstly, the email hyperlinks on the Web site are one-way communication, and the sub-site containing this kind of feature is ranked as level 2 in the Web Site Evaluation Form 3B. Secondly, the hyperlink "Online Forms" on the Web site can be used to either download a document or to complete the information on the form. The former is just a feature of downloading information whereas the latter is a feature of one-way communication. Thirdly, a search feature with the drag-down menu is a feature of one-way communication while a search engine is a two-way communication. Fourthly, it is helpful to assess the introductory information concerning the feature, which is inaccessible (e.g. password-protected), in order to judge the interactivity of this sub-site.

In terms of Web site evaluation criteria, the literature seemed to suggest that informativeness and interactivity (e.g. Angehrn & Meyer, 1997; Axelsson, 2003; Bhatt & Emdad, 2001; Chen et al., 2003; Ellinger et al., 2003; Hoey, 1998; Kollmann, 2000; Kuo et al., 2004; Mirani & Lederer, 1998; Palmer & Griffith, 1998b; Quelch & Klein, 1996; Rayport & Sviokla, 1995) are two key criteria for evaluating how effectively and efficiently Web sites support OCAs. The results of this research show that these two criteria are capable of evaluating how effectively and efficiently Web sites support OCAs in the universities in New Zealand. However, this research finds a third criterion, that is, consistency. This criterion concerns how consistent the designs of the Web site are. Moreover, together with the criterion informativeness, this is the other criterion which can be utilised to evaluate the level of effectiveness of the support made to OCAs from Web sites. Yet, the premise of adopting these criteria is that the evaluation is from the perspective of an organisational provider only. In other

words, the evaluation is from a provider's viewpoint and seeks how much value the Web site can provide to the university which supplies the Web site.

Fifthly, judging OCAs the sub-site support requires the evaluator to assess the hyperlinks on the sub-site, check any objective statement of the sub-site, check the title of the page, check the intended users, check the path linking to the sub-site, check the content information, check the domain of the sub-site and check the location of the hyperlink pointing to this sub-site. Lastly, listing the names of OCAs and answers alphabetically in the Web Site Evaluation Forms can enhance the efficiency of evaluation process. For example, the OCAs in the Web Site Evaluation Form 2 are listed alphabetically. Thus, the evaluators can search a specific OCA efficiently during the evaluation process.

7.2.4 Findings relating to Research Question 4

The fourth research question is:

> ***How can the overall support made to an organisation's OCAs from their Web site be discussed? How can the results be translated into useful suggestions to improve the Web site and what framework and method can be used?***

The findings relating to this research question are summarised in Table 7.4.

Table 7.4 *Summary of findings relating to Research Question 4*

Subquestions in Research Question 4	Summary of Research Findings
How can the overall support be discussed based on the results elicited from the management and from the Web site evaluation?	The overall support discussion is based on the qualitative dimension level. Thus, the discussion is a qualitative format, and a list of dimensions is required. There are three stages which should be conducted: 1. Prioritising Organisational Critical Activities; 2. Prioritising; and 3. Overall Support Discussion.
What framework and method can be used to discuss the overall support?	The tools which should be utilised are: • OCA Repository; • Interview Normalisation Interview Prioritising Principles; • Web Prioritising Principles; and • the Overall Support Display Diagram.

Table 7.4 shows that the overall support discussion made in this research is based on the qualitative approach of discussing alignment (e.g. Baets, 1992; Henderson & Venkatraman, 1993; Henderson et al., 1996; Luftman et al., 1993; Papp, 2001; Venkatraman et al., 1993) and discussing the dimension levels of the alignment (e.g. Cragg et al., 2002; Hussin et al., 2002; Sabherwal & Chan, 2001). The results of this research show that this approach is appropriate for discussing how effectively and efficiently the Web site supports each of the OCAs in a qualitative format. When adopting this approach to discuss the overall support, a list of dimensions is required. The OCA Repository serves as these dimensions.

This research also developed three stages to normalise, score, prioritise, and discuss the results. The three stages are Prioritising Organisational Critical Activities, Prioritising, and Overall Support Discussion. The Interview Prioritising principles, Web Prioritising Principles, and the Overall Support Display Diagram are the tools to assist in conducting the tasks included in these three stages. How these tools should be utilised in the three stages are summarised below.

The stage of Prioritising OCAs aims to generate a list of OCAs from the interview results. As mentioned previously, management has various views on what OCAs the university is conducting. Thus, there is a need to develop tools to transform various views into a shared view. To achieve this aim, a list of Interview Normalisation Principles is provided in this stage. They can be utilised to normalise the OCAs which were nominated by the interviewees to be in accordance with the terms contained in the OCA Repository. Then, the Interview Scoring Principles can help the interviewer add scores onto the normalised OCAs. Finally, the Prioritising Principles are utilised to prioritise these normalised and scored OCAs.

The stage of Prioritising aims to generate a list of OCAs from the results of Web site evaluation based on four Web Prioritising Principles. In comparison with prioritising interview results, the prioritising of Web site evaluation results involves more quantitative judgement, such as counting the number of sub-sites and assessing the amount of information in the Web site.

The stage of Overall Support Discussion aims to achieve three tasks; comparison, discussion, and suggestion. The comparison task compares the priorities of the lists of OCAs nominated by management and extracted from the Web site. According to the meaning of overall support discussed in this research, these two lists

should be the same. Then, the discussion task assesses how effectively and efficiently the current Web site supports the OCAs nominated by the management in terms of informativeness, consistency, and interactivity. Finally, some suggestions are made for the Web team to improve the Web site. This research confirms what has been suggested in the IS alignment literature (e.g. Cobb et al., 1998; Hirschheim & Sabherwal, 2001) that utilising a diagram helps organisations in pursuing the efforts which create the support between two constructs. The Overall Support Display Diagram developed in this research is helpful to visualise how effectively the OCAs are currently supported by the Web site and how the Web site can be improved in order to provide a better support.

7.2.5 Extra findings

Several extra findings were found other than the findings specifically used to answer the research questions. Firstly, this research confirmed what has been suggested by the literature that the organisational strategies and the environment have an influence on the universities in their ways of conducting OCAs (e.g. Chan et al., 1997; Miles & Snow, 1978; Mintzberg, 1978; Porter & Millar, 1985; Venkatraman & Camillus, 1984; Venkatraman et al., 1993). This research also found three strategic factors – the vision of the university, its strategy and strategic plan, and the policies; and four environmental factors – government policies, the geographical location of the university, the overseas market, and the competition environment. These factors have an influence on what OCAs the university is conducting and their priority. When any of these factors is changed, the university can choose to add a new OCA into their, for example, top five list. Alternatively, they can shift an OCA, which is already in their top list to a higher or lower priority.

Secondly, although two universities have the same list of OCAs (same content and priority), it is possible that they have a variety of meanings and supporting activities to the OCAs. For example, both University A and University B prioritised the "efficient teaching and learning" activity as high priority. However, the meaning is different for each of them. For University A, the teaching means providing industry-linked courses because they were a polytechnic and the market of industrial courses is still their focus. For University B, the teaching means providing more academically- oriented courses so that the undergraduate students can continue their

postgraduate studies easily after they complete their degrees. Therefore, the supporting activities for this OCA are different in the two universities.

Thirdly, OCAs can be short or long-term. Although they are a constant activity, OCAs can be both short or long-term included in the list of management. In other words, the priority of the short-term OCA is changed very often and possibly will be moved out of the list of OCAs, while the long-term is not changed frequently. The short-term OCA tends to be a detailed activity, solving current problems, be a "constant project" (after certain period, it is no longer a priority in the list, but still running), involve less resource, and help the university gain return in a shorter period. In contrast, the long-term OCA is a broader activity, acting to solve a major problem which has been lasting for a long time, a long-term goal (it can be difficult to achieved, thus is required to be conducted with concentration every year), involving more resource, and helping the university gain return in a longer period.

Fourthly, there are interrelationships between OCAs. Some interviewees believed that some of the activities are interlinked. This has caused difficulties for them in prioritising their nominated OCAs. Most often, research and teaching are interlinked. As shown by many interviewees, the teaching in universities should be informed by teaching. This is where they differentiate themselves from polytechnics. This research also found that the reasons which cause the interrelationships can be two – financial and supporting. The financial reason means that OCAs are interlinked because the university only supply a certain amount of budget to these activities. If one is prioritised higher, more budget will be invested and others will attract lower investment. The supporting reason means that OCAs are interlinked because one provides support to others.

Lastly, several lessons have been learned on how the OCAWSEM can be developed. Firstly, it is suggested that the Organisational Provider Perspective should be adopted when developing the OCAWSEM. Second, interviewing the management team should be carried out in order to elicit specific OCAs which are being conducted in the particular industry. Third, the criteria used when evaluating the Web sites from the organisational provider's perspective are different from those criteria employed when adopting the user's perspective. Fourth, it was found in this research that the manual approach is more appropriate than the automated approach for Web site evaluations. Fifth, the assessment and discussion on the overall support, which is

based on qualitative dimension level, allows universities to monitor what OCAs are being supported effectively and efficiently by Web sites. Sixth, a series of case studies based on the ICD should be conducted in order to improve and test the Prototype OCAWSEM. Seventh, the quality of the OCAWSEM should be assessed by the criteria of validity, reliability, usability, extensibility, and adaptability.

7.3 Limitations of this Research

The limitations of this research are four aspects relating to the interviews, to the Web site evaluations, to the overall support discussion, and to the research design. They are discussed below.

7.3.1 Limitations relating to the interviews

There are four limitations relating to the interviews in this research. The first limitation occurred when some interviewees set a limit on the time frame of the interviews. Most of the interviewees allowed enough time to pose the Formal Interview Questions prepared in the Interview Guide and to pose more Interactive Interview Questions, however, some did not. This meant that it was not possible to pose some of the Interactive Interview Questions or some of the Formal Interview Questions were incompletely posed. For example, one interviewee only allowed a five-minute interview. Thus, it was impossible to ask all questions in the Interview Guide. Although the interviewee still can nominate a list of OCAs in such a short time, it is still a limitation to access to the profounder knowledge relating to the OCAs.

The second limitation is that some interviewees were unwilling to share sensitive information of the university. This occurred frequently in some specific occasions. For example, when asking one interviewee to nominate those activities which were significantly resourced or asking them to prioritise the activities according to which were actually significantly resourced, he declined. The reason is what has been actually significantly resourced is not allowed to be shared. Thus, the unwillingness to share sensitive information from the interviewee is another limitation which occurred during the interview.

The third limitation is that the normalisation of OCAs involves a degree of subjective judgement. This limitation occurred during the data analysis of interview results. Because this research only adopts the individual learning perspective, it is not proper to involve another researcher to learn how the nominated terms can be normalised and normalise the terms. Thus, the normalisation of OCAs involves a degree of subjective judgement.

The fourth limitation is the access to the important interviewees. This research has tried to access at least one interviewee from the senior management, middle management, and the Web Team in order to triangulate the views on OCAs. Other staff members as identified by interviewees as knowing the OCAs of the university were inaccessible. Thus, the access to those important staff members is another limitation.

7.3.2 Limitations relating to the Web site evaluations

Two limitations have been identified regarding to the Web site evaluations conducted in this research. The first limitation is that this research only evaluates some of sub-sites in a university Web site. The sub-sites assessed include the sub-sites which are two levels down from the Homepage, the university level of sub-sites, the accessible sub-sites, and the sub-sites owned by the university. Thus, the sub-site which may support a new OCA that is not listed in the OCA Repository, is not assessed and the new OCA may not be found.

Moreover, the sub-site, which is a departmental sub-site, an inaccessible sub-site, or a sub-site owned by an organisation external to the university, is not assessed in this research. It is argued here that while these sub-sites may still support some of the OCAs of the university, because of financial reasons, for example, a university may place a hyperlink to an external sub-site owned by the other organisation. Staff can order stationery from there rather than the university build a sub-site. Although this sub-site supports the OCA of "buying supplementary material", this research does not evaluated it because it is not owned by the university.

The second limitation is that files or documents to be downloaded are not counted as supporting OCAs because this research only evaluates sub-sites rather than files or documents. However, they still can provide information to support OCAs in

the practical situations. Perhaps more research should evaluate how effectively those files and documents can support OCAs.

7.3.3 Limitations relating to the overall support discussion

There is a limitation on the overall support discussion made in this research. This limitation is an assumption. This research assumed that the Web site should provide as much information as possible to the OCAs. However, there is limited evidence proving that universities have to supply every kind of information including the one which they are not willing to share on the Web site, such as the secret information on the Web site. This is a limitation. For example, the "financial management" activity is nominated by management as an OCA. Yet, the Web site of the university does not reveal much information about the financial information of the university. By applying the methods suggested in this research, the university should provide more financial information on their Web site. However, it can be impractical for the university to do so due to the risk of revealing university's secret information to the public. Thus, this assumption is a limitation to the overall support discussion in this research.

7.3.4 Limitations relating to the research design

There are two limitations on the research design in this research. The first comes from the particular philosophical paradigms on which this research is based. These paradigms are interpretive case studies, postmodernism, hermeneutic phenomenology, and individual action learning. Adopting these paradigms can be a limitation. It is because this forces readers to accept particular philosophical paradigms in order to believe this is a quality research. If they do not agree on adopting the paradigms, these paradigms will become limitations. For example, the individual learning process is a limitation if the reader believes that quality results only come from a group learning process.

The second limitation is in the decision of the sequence of conducting the case studies. This research decided to start the case study process from these cases which were more difficult to revisit and were smaller in terms of student numbers. One may argue that this is an arbitrary decision. This research recognises the arbitrary decision

is a limitation on the research design, and claims that others may find different ways to decide the sequence to conduct the case studies.

7.4 Future Research

This section will address the future research arising out of this research. Various topics of future research have been identified. They are related to five main areas: OCAs, the Web site and its evaluation, the overall support, the OCAWSEM, and the ICD.

7.4.1 Research relating to OCAs

This research identifies six topics for future research on OCAs. The first topic is continuously examining and testing the conceptual model of OCAs, more specifically, how the strategic factors and environmental factors affect organisations determining and conducting their OCAs, and how strong the effect is.

Since this research only studies what OCAs the management thinks they are conducting, future research could test and extend the conceptual model of OCAs through statistical testing on the interrelationships between the factors in the model. Then, this extended model can be applied to cases in a variety of industries in order to assist these cases in finding what OCAs they should be conducting through the analysis of the factors included in the model. The focus of this extended model is on what OCAs they should be conducting rather than what OCAs they think they are conducting. Therefore, the extended model will be an analytic model which can be utilised by organisations to identify proper OCAs.

The second topic is to examine to what extent OCAs enable organisations' success. This research studied the activities nominated by management as OCAs. However, are they really critical to the university's success in the real world situation? Future research could develop the mechanisms to confirm whether, and to what extent, these OCAs which were nominated by management have an impact on organisations' success.

The third topic is to understand other levels of OCAs. The OCA studied in this research contributes to the university level of success. It can be recognised as an OCA.

From the results of interviews, it was found that some activities are critical to the success of the industry, the campus, the department, and the job. These activities can be recognised as "Industry CAs", "Campus CAs", "Departmental CAs", and "Job CAs". Future research could study how these types of activities, their characteristics, and the interrelationships between these types of activities can be identified. A topic can be, for example, can Industry CAs be translated into Campus CAs and then into Departmental CAs.

The fourth topic concerns how to prioritise between short- and long-term OCAs. This research accepts the recognition of interviewees on the priority of the short- and long-term OCAs. However, should the long-term OCA be prioritised higher or lower than the short-term? How can organisations manage these two types of OCAs effectively?

The fifth topic is about studying the interrelationship between OCAs. The interviewees in this research noted that there was an interrelationship between some OCAs, and this interrelationship had caused difficulties in prioritisation. Future research can explore the understanding of this interrelationship and how organisations should prioritise among these interrelated OCAs.

The sixth topic studies the way to assign resources to the OCAs. Since OCAs are critical to the success of organisations, they must be conducted continually and monitored seriously. Thus, future research could study the way to allocate resources and time to the OCAs properly, based on their priority. For example, is there a feasible staff number and amount of budget to the OCA for maximisation of success?

7.4.2 Research relating to the Web and its evaluation

In terms of Web sites, there are two topics which should be studied in the future. One concerns forming possible Web typologies, and the other studies the kinds of information which should be placed on Web sites.

The results from the Web site evaluations in this research show that Web sites do provide more support to some OCAs than the others. Because OCAs have a strong relationship with business strategies, more support to some OCAs implies that the Web site may support a particular type of strategy. Then, this "particular type of Web site", which supports "particular type of strategy", might become a "particular Web typology". It is hypothesised that the Web sites categorised in the same Web typology

share some characteristics, and those categorised in different typology are distinguished by certain traits. Future research could try to develop the mechanism to identify the Web typology for organisations.

The other one is to study what kinds of information should be placed on Web sites. Based on the analytic outcome made from the OCAWSEM, some suggestions are given to the management in regard to how they should improve their Web sites, primarily, what kinds of information they should supply on the Web sites. However, some OCAs are difficult to be fully supported by the Web site. For example, conducting the "financial management" activity involves secret information. Thus, future research can study whether a particular type of secret information should appear on the Web site, and how to enable transmission of such information securely and by what technologies.

In terms of Web site evaluation, there are also two topics which can be studied continuously in the future. Firstly, it is to continue advancing the knowledge and methods of adopting the three evaluation criteria (informativeness, interactivity, and consistency). In regard to informativeness, it is to develop the measurement method on how informatively the files and documents on the Web site support OCAs. In regard to interactivity, it is to search new Web features continuously, and categorise into the three levels of interactivity from other state-of-the-art Web sites. In regard to consistency, it is to measure the impact made on the organisation's brand image from a consistent or inconsistent Web design.

Secondly, it is to study how the Organisation Provider and Organisation User perspectives can be integrated. For example, a university can assess how effectively and efficiently their Web site supports advertising and marketing activities by utilising the Developed OCAWSEM. However, one can also apply those "user-centred" evaluation criteria to evaluate how effectively and efficiently the Web site supports advertising and marketing activities. Is there any evaluation methodology which can integrate these two types of methodology into one?

7.4.3 Research relating to the overall support discussion

In terms of overall support discussion, there are three topics of future research which have been identified. The first topic is interested in employing different perspectives to discuss the overall support. The overall support discussion made in this research is

based on the perspective of qualitative and dimension levels. Future research can develop the instructions to categorise the overall support into several qualitative levels. These levels can be then used by management to examine what level of overall support their Web site has given to their OCAs. Alternatively, researchers can also try to quantify the overall support (e.g. the degrees).

The second topic is to examine whether those OCAs which were nominated by management can actually contribute an organisation's success. The OCAs which were nominated by management in this research are believed by the management as critical to the university's success. Yet, whether they contribute to the university's success in the real world situation is questionable. Thus, more research is needed to examine whether those OCAs which are nominated by the management, can actually enable the university's or organisation's success.

The fourth topic concerns studying the two-way alignment between OCAs and Web sites. The overall support discussed in this research is only a one-way alignment between the OCAs and Web sites, and the OCA is the driver. Yet, it is possible that the Web site could be a driver in the overall support. Thus, the question is Should the management consider their Web capability while developing a list of OCAs? More research is needed to prove that this type of overall support exists. If it exists, how can this overall support be discussed? If it does not exist, why not? Is there any conflict existing when both OCAs and Web sites are drivers?

7.4.4 Research relating to the Developed OCAWSEM

The future research relating to the Developed OCAWSEM is to test this methodology on the universities in other countries. This research has conducted case studies in all universities in New Zealand in the methodology development process. To increase the generalisability on universities, future research should apply and test the Developed OCAWSEM on the universities in different countries. Nevertheless, it is suggested to test this methodology in other industries in regard to its generalisability. Due to the hunger needs of e-commerce from many industries, there is a demand to apply the Developed OCAWSEM to a variety of industries. To do so will advance the understanding of measuring and achieving the support made to OCAs from Web sites.

7.4.5 Research relating to the ICD

The result has shown that the ICD is a superior design to perform development, learning, and improvement tasks at the same time in the case studies. To enhance the maturity of applying the ICD in case studies, future research should apply it more often as a learning tool into the conceptual areas where the substantial theories are absent, there is a need to develop fundamental measurement tools, and explore the knowledge at the same time. Three groups of research questions are identified here. Firstly, can the case studies based on the ICD be used to develop other types of instrument, such as a financial measure instrument? If yes, how can this objective be achieved? Secondly, can the ten principles of quality assessment developed in this research be used by other research projects which are based on different research settings? Thirdly, is there any principle which can be used to decide the sequence of case studies in an ICD?

7.5 Contributions of this Research

In total, this research provides four major research contributions to both academics and practitioners: the notion of OCAs, the specific Web site evaluation perspective approach, and the OCAWSEM for evaluating how effectively and efficiently Web sites support OCAs, and the ICD for designing case studies. They are discussed below.

7.5.1 Notion of OCAs

This thesis proposes the notion of OCAs, which provides substantial contributions to both academics and practitioners. From the academic perspective, OCAs fill a gap in the support made to organisational strategies from Web sites. In the literature, the support made to organisational strategies from IS strategies/technologies has been thoroughly discussed. However, the understanding of the support made to organisational strategies from Web sites is limited. The notion of OCAs serves as an intermediary linking the support given to organisational strategies by Web sites. This argument is evident from two aspects of findings. On one hand, this research confirms the implications revealed from the literature that organisational strategies have strong influences on the way organisations choose and conduct OCAs. On the other hand,

this research found that university's Web sites do support some OCAs. Thus, OCAs play a central role in linking the Web site to organisational strategies. If the Web site is not supporting most of the OCAs, it is questionable that the Web site is supporting the university's strategies.

The notion of OCAs also complements our understanding and utilisation of CSFs methodology (CSF, e.g. Butler & Fitzgerald, 1999; Gadenne, 1999; Lee & Cata, 2005; Rockart, 1979; Sabherwal & Kirs, 1994). This research will contribute to understanding how to utilise Web sites to support CSFs in achieving organisational success. The notion of OCAs also calls for shifting the focus to the activities in the outcome of CSFs Methodology from both activities and factors. Although this research does not prove whether the support made to those "critical factors" (part of CSFs) from Web sites is measurable, the results show that the support made to OCAs from Web sites is measurable.

From the practical perspective, the notion of OCAs can be used to assist organisations in fitting with environment externally and in coordinating the views of management internally. For example, an organisation can adopt what has been suggested in this research to assess the strategic and environmental factors periodically in order to identify proper OCAs which help them continually fit with the environment. The organisation can also adopt relevant components in the Developed OCAWSEM to elicit views on the OCAs across the senior management (or all the management, if possible), and then to examine whether they have a coherent view on the organisation's OCAs. If not, perhaps composing an OCAs statement and disseminating it to the management is an effective way to create coherent views internally.

7.5.2 The Web site evaluation perspective and approach

The Web site evaluation perspective and approach employed in this research also provides contributions to both academics and practitioners. In terms of Web site evaluation perspective, this research adopts the perspective of an organisational provider. This is different from the majority of published literature which takes the user's perspective on Web site evaluation (e.g. Agarwal & Venkatesh, 2002; Chen & Macredie, 2005; Konradt et al., 2003; Nielsen, 1993; Palmer, 2002). In particular, this research confirms that effectiveness and efficiency are two kinds of value which the

Information Systems can provide to organisations in terms of adding value to the organisation (Andreu et al., 1992; Bakos & Treacy, 1986; Edwards et al., 1995; Pant & Hsu, 1996). The results show that effectiveness and efficiency are two critical aspects where the Web site can generate organisational benefits. Moreover, informativeness, interactivity, and consistency are proper criteria for researchers to conduct a Web site evaluation from the organisational provider's perspective.

From the academic sense, this particular perspective contributes to the literature since it calls Web researchers to have a balanced view on the issues relating to the user, provider, and customer of the Web site. Nevertheless, the Organisation Provider perspective complements the user perspective. From the practical sense, the Organisation Provider perspective gives organisations an opportunity to monitor their Web sites by themselves due to the absence of user and customer involvement. This perspective helps organisations evaluate and improve their Web sites to better support organisational desires. However, this research is neither trying to argue that this is the only perspective that the organisations should adopt in their Web site evaluations, nor the Organisation Provider perspective is more important than others. Instead, this perspective tends to help the Web site provider to identify potential areas on the Web site for future improvements in order to provide benefits to the organisation that supplies the Web site.

The manual approach of the Web site evaluation is another contribution, which this research provides to the literature. The manual approach is not new in the Web site evaluation literature (e.g. Garcia et al., 2003; Hung & McQueen, 2004; Kuo et al., 2004; Magal et al., 2001; Nielsen, 1995; Palmer, 2002; Sing, 2004; Wan & Chung, 1998). It also has been employed frequently when organisations are trying to learn new technologies from others' Web sites. Thus, the contribution provided by this research is not on this approach itself, but a demonstration on how its major weakness has been dealt with through a systematic way of evaluation of the Web sites by utilising a systematic process and the Web Site Evaluation Forms part of the OCAWSEM.

7.5.3 The Developed OCAWSEM

Another contribution made by this research is the Developed OCAWSEM produced through a series of case studies. This methodology can be utilised to measure how

well the Web site is supporting OCAs. The contribution relating to the Developed OCAWSEM can be divided into four aspects: OCAs, Web site, support, and the process of methodology development.

From the OCAs aspect, the Developed OCAWSEM assists universities in identifying their OCAs. Nevertheless, the Developed OCAWSEM can be a training tool for the evaluator to gain experience on eliciting OCAs from management. This is similar to the suggestion made by Boynton & Zmud (1984) on applying CSFs Methodology, which means that the researcher will gain experience and knowledge on utilising CSFs Methodology properly through applying the methodology. Thus, the researcher can be more experienced on eliciting OCAs after applying the Developed OCAWSEM some times, and the results elicited should be more reliable.

From the support aspect, the Developed OCAWSEM assists organisations in knowing what OCAs are supported by the Web site and how those poorly supported OCAs can be improved. Then, the results can help Web Managers prioritise their Web projects. For example, the evaluator reports the priority of the well supported OCAs and those poorly supported or non-supported OCAs to the Web Manager. The manager then can assign more weight to those Web projects which can improve specific Web designs in order to support the OCAs properly. Furthermore, the Developed OCAWSEM can be a basis for developing other kinds of OCAWSEM in different environments.

From the perspective of methodology developing process, this research provides a process for developing an OCAWSEM. This process can be broadly divided into two stages. The first stage is to develop the Prototype OCAWSEM based on the theoretical foundations. At this stage, one must decide proper approach to elicit lists of OCAs from management and Web sites, proper evaluation perspective and criteria, and how the overall support should be measured. Then, the prototype needs to provide relevant tools which can be used to elicit lists of OCAs from management and Web sites, and discuss the overall support. The second stage is to conduct a series of case studies to develop and test the prototype. This process can be adopted to develop a specific OCAWSEM which can be utilised in other environments.

7.5.4 The ICD

This research has introduced a specific research design named iterative case design (ICD) to design the case studies for the development of the Prototype OCAWSEM. The idea of involving the iteration in case studies has originated from the iteration process used in usability test (e.g. Agarwal & Venkatesh, 2002; Chen & Macredie, 2005; Konradt et al., 2003; Nielsen, 1993; Palmer, 2002) and systems development (e.g. Milton et al., 2005). It is a specific type of multiple-case design and borrows theoretical supports from that. However, the major characteristic is that it involves a reflection stage between the cases, and the whole case study process becomes an iterative learning and developing process. This type of case studies produces several contributions to the academic and research methodology literature.

Firstly, the ICD gives the researcher opportunities to explore conceptual areas deeply and to develop evaluation instruments (e.g. interview questions, and the Web Site Evaluation Forms) through a series of case studies at the same time. Since it is a highly explorative approach, it can help researchers understand what lies behind any phenomenon about which little is known and gain profounder knowledge. At the same time, researchers are able to utilise the knowledge to develop evaluation instruments.

Secondly, the ICD also enables the researcher to improve evaluation instruments through the series of case studies. From this perspective, all the case studies are like a "testing process" which allows the researcher to find a new improvement and test it. The improvement can be accepted, modified, or abandoned. Although the abandoned idea is a waste of time and it seems that the researcher made a mistake, it provides value for the researcher to understand why the improvement does not work, to learn from making the mistake, and most importantly to allow other researchers to avoid making the mistake again in the future.

Thirdly, ten principles have been chosen to assess the quality of the research design and the research framework based on ICD carried out in this research. They are the principle of proper data collection methods, the principle of proper data collection techniques, the principle of multiple interpretations, the principle of interaction between the researchers and the subjects, the principle of the hermeneutics circle, the principle of relevance, the principle of creating in-depth knowledge, the principle of contextualisation, the principle of dialogical reasoning and the principle of suspicion. These principles are used to assess the overall research design, data

collection, data analysis, and results of this research. This research claims that these principles can give researchers more choices other than the seven principles given by Klein & Myers (1999) for developing their own assessment principles when developing specific types of evaluation methodology based on the ICD.

7.6 Concluding Remarks

The major task of this research was to develop an evaluation methodology which can be utilised to evaluate the support given to "Organisational Critical Activities" (OCAs) by Web sites. This methodology is termed "OCA Web Support Evaluation Methodology" (Prototype OCAWSEM). In order to achieve this task, it was necessary to understand the meaning and characteristics of OCAs, the methods and resources which can be used to elicit OCAs, methods which can be used to evaluate the organisation's Web site, and the method which can be used to discuss the overall support and then to make useful suggestions to improve the Web site.

A review of key literature areas provided theoretical foundations to develop a Prototype OCAWSEM. This prototype was then developed and tested in eight universities in New Zealand, based on the iterative case design (ICD) which is a specific research design used to guide the case studies for the development of the Prototype OCAWSEM. The research outcome shows that the Developed OCAWSEM is a valid and reliable methodology for the evaluation of the support for OCAs from Web sites in the universities in New Zealand.

In addition to the Developed OCASWEM, this research also provides several crucial findings. Firstly, OCAs are different from CSFs, value-added activities, strategic activities, organisational competencies, and organisational strengths. OCAs are not limited to those generic value-added activities included in Porter's (1985) value chain. They can be specific terms used in a particular industry. The research findings show that OCAs must be the activities which share these characteristics: being constantly conducted; having organisational priorities; being significantly resourced; being discussed, managed, and monitored by senior management regularly; and being critical to organisational short, medium, and long-term success.

Secondly, this research finds that the external assessment and self-typing methods can be utilised for eliciting OCAs. When adopting the external assessment method, both the strategic and environmental factors should be considered. When adopting the self-typing method, the semi-structured interviews without supplying the OCA list to the management team is appropriate to generate more specific OCAs which are conducted by organisations in a particular industry. This research provides a definition of OCAs and two types of interview questions – Formal Interview Questions and Interactive Interview Questions, to help elicit OCAs from the management team. This research also provides some useful lessons to help elicit OCAs in the interviews.

Thirdly, this research confirms that informativeness and interactivity are two key criteria for evaluating how effectively and efficiently Web sites support OCAs. This research also finds a third criterion, that is, consistency. Moreover, four stages in the Evaluation Process Instructions (Stages 4 to 7), the Web Evaluation Framework, and the lessons learned about Web site evaluations discussed in this research should be also utilised. The research results confirm what has been suggested in the literature that the use of the evaluation instructions and framework provides a systematic way to evaluate Web sites.

Fourthly, this research suggests that the approach of the qualitative dimension level should be adopted for discussing how well the Web site supports the OCAs. It is because this approach provides the opportunity to discuss how well the Web site supports each of the OCAs individually and how the Web site can be improved in order to support each of the OCAs more effectively and efficiently. This research also provides various kinds of principles and an Overall Support Display Diagram to guide the discussion of the support and the improvement to be made on the Web site.

The major contributions of this research are centred on proposing the notion of OCAs, the Developed OCAWSEM, and the specific research design – ICD. The future prospects for this research also focus on these aspects. Thus, this research serves as a foundation stone to advance our understanding in the future about the notion of OCAs, the evaluation of Web sites in supporting OCAs, the development of the OCAWSEM which can be utilised in other industries, and the use of ICD in different research settings.

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Appendix 1 Prototype OCAWSEM

The Prototype OCAWSEM includes eight components: Evaluation Process Instructions, Interview Guide, OCA Repository, Web Site Evaluation Form 1, Web Site Evaluation Form 2, Web Site Evaluation Form 3, Web Site Evaluation Form 4, and Overall Support Display Diagram. These components are shown in the following subheadings from A1.1 to A1.8.

A1.1 Evaluation Process Instructions

Evaluation Process Instructions

Stage 1 – Identify Management Views:
1. Conduct interviews with senior management team, Web team, and other members referred by interviewees.
2. Record interviews.

Stage 2 – Analyse Interview Data:
1. Transcribe interviews.
2. Generate a list of organisational critical activities from interviews.

Stage 3 – Prioritise Organisational Critical Activities:
1. The activity as nominated by more interviewees is more critical

Stage 4 – Investigate Web Background:
1. Browse through the Web site, and answer following questions:
   - Does the Web site comprise Internet, intranet(s), and extranet(s) Homepages?
   - Is password required to access into Internet, intranet(s), and extranet(s)?
   - What are intended user groups of the Web site?
2. Then, complete Evaluation Form 1

Stage 5 – Confirm and Generate Organisational Critical Activities:
1. Start from the Homepage, click one hyperlink and follow the hyperlink to the first level of sub-site.
2. Identify the organisational critical activities listed in the OCA Repository which this sub-site is supporting.
3. Record the name of the sub-site and how to find it in Evaluation Form 2.
4. If the organisational critical activity supported by the hyperlink is not listed in OCA Repository, add to the OCA Repository and repeat step 3.
5. Repeat steps 1 to 4 until all the hyperlinks on university Homepage are evaluated.
6. Apply steps 1 to 5 to the second level sub-sites of the Homepage.
7. Repeat steps 1 to 6 on the Homepages of intranet and extranet.

Stage 6 – Analyse Effectiveness and Efficiency:
1. Use the Web site to conduct one organisational critical activity in Evaluation Form 3 (include all the Web pages of Internet, intranet, and extranet).
2. Conduct evaluation by using the criteria in Evaluation Form 3.
3. Record the result onto Evaluation Form 3.
4. Repeat steps 1 to 3 on the rest of organisational critical activities in Evaluation Form 3.

Stage 7 – Group:
1. Based on the results of Evaluation Form 3, assign one organisational critical activity to Evaluation Form 4.
2. Repeat this process on the rest organisational critical activities in Evaluation Form 3.

Stage 8 – Prioritise:
1. Identify the priority for all viewed organisational critical activities in Evaluation Form 4.
   a. The organisational critical activity in higher category has higher priority than the one in the lower level.
   b. The activity, which is supported by more sub-sites, has higher priority.

Stage 9 – Discuss Overall Support:
1. Compare the priorities of the organisational critical activities nominated by management and extracted from the Web site.
2. Discuss how well these two lists are matched.
3. Assign those organisational critical activities which were viewed by the management and also listed in Evaluation Form 4, into the Overall Support Display Diagram.
4. Make suggestions for the Web team to improve the Web site.

A1.2 Interview Guide

Interview Guide

Interviewee's Name:_____

Interview Time:_____

Location:_____

Statement of Ethical Issues:

- Participants will have the right to refuse to answer any particular question, and withdraw from the study at any time.
- Names of individuals and organisations will not be used in the thesis unless specific permission is sought and received. No publication of specific names of individuals or organization will be undertaken unless specific written agreement is sought and received from the named individuals.
- Data collected by the researcher will be held confidentially and securely. The outcomes of the research will be contained in a PhD Thesis for the University of Waikato University for academic purposes.

Interview Questions:

1. Please describe your role and your job, and how long you have been in this job.

Organisational Critical Activity Statement:

Organisational critical activity is an activity which must be conducted by the university constantly to be successful in the industry.

2. Please describe what this organisation's organisational critical activities are?
    - What is their priority?
    - How do you support and enable these organisational critical activities?

3. Would you suggest other people who know about the organisational critical activities in this organisation and I can have interviews with them?

A1.3 OCA Repository

OCA Repository	
No.	**Organisational Critical Activities**
1	Advertising
2	Providing scholarships
3	Recruiting students
4	Conducting marketing research
5	Sustaining educational and research funding
6	Providing student learning supports
7	Providing student services
8	Conducting research
9	Developing new courses
10	Developing new services
11	Managing information
12	Providing library services
13	Assuring teaching quality
14	Efficient teaching and learning
15	Financial auditing
16	Developing strategic plan
17	Timely provision of student enrolment and academic records
18	Recruiting staff
19	Training staff
20	Retaining staff
21	Developing new technology
22	Buying supplementary material
23	Internal communication
24	External communication
25	Maintaining partnership with other institutions
26	Imaging, branding, and reputation
27	Creating university culture
28	Expansion on enrolment branches
29	Maintaining relationships with businesses and local community

A1.4 Web Site Evaluation Form 1

Web Site Evaluation Form 1

Does the Web site comprise the Homepages of following domains (see *)?

Domain (Yes/No)		***Password protected?***	***Name of the Homepage***
Internet			
Intranet			
Extranet			

What are the intended user groups of the Web site?

**Definitions of Web Domains are:*

- *Internet: The Web pages can be accessed by any users and are password free.*
- *Intranet: The Web pages can only be accessed by employees of the organisation and are password protected.*
- *Extranet: The Web pages can only be accessed by suppliers or buyers of the organisation and are password protected.*

A1.5 Web Site Evaluation Form 2

Web Site Evaluation Form 2 (Page 1)

No	Organisational Critical Activities	Internet Domain Supported?	Extranet Domain Supported?	Intranet Domain Supported?	Title of the Sub-site									
1	Advertising													
2	Providing scholarships													
3	Recruiting students													
4	Conducting marketing research													
5	Sustaining educational funding													
6	Providing student learning supports													
7	Providing student services													
8	Conducting research													
9	Developing new courses													
10	Developing new services													

Web Site Evaluation Form 2 (Page 2)

No	Organisational Critical Activities	Internet Domain Supported?	Extranet Domain Supported?	Intranet Domain Supported?	Title of the Sub-site
11	Managing information				
12	Providing library services				
13	Assuring teaching quality				
14	Efficient teaching and learning				
15	Financial auditing				
16	Developing strategic plan				
17	Timely provision of student enrolment and academic records				
18	Recruiting staff				
19	Training Staff				
20	Retaining Staff				

Web Site Evaluation Form 2 (Page 3)

No	Organisational Critical Activities	Internet Domain Supported?	Extranet Domain Supported?	Intranet Domain Supported?	Title of the Sub-site
21	Developing new technology				
22	Buying supplementary material				
23	Internal communication				
24	External communication				
25	Maintaining partnership with other institutions				
26	Imaging, branding, and reputation				
27	Creating university culture				
28	Expansion on enrolment branches				
29	Managing information				

A1.6 Web Site Evaluation Form 3

Web Site Evaluation Form 3

No	Organisational Critical Activities	Effectiveness	Efficiency
1	Advertising		
2	Providing scholarships		
3	Recruiting students		
4	Conducting marketing research		
5	Sustaining educational and research funding		
6	Providing student learning supports		
7	Providing student services		
8	Conducting research		
9	Developing new courses		
10	Developing new services		
11	Managing information		
12	Providing library services		
13	Assuring teaching quality		
14	Efficient teaching and learning		
15	Financial auditing		
16	Developing strategic plan		
17	Timely provision of student enrolment and academic records		
18	Recruiting staff		
19	Training staff		
20	Retaining staff		
21	Developing new technology		
22	Buying supplementary material		
23	Internal communication		
24	External communication		
25	Maintaining partnership with other institutions		
26	Imaging, branding, and reputation		
27	Creating university culture		
28	Expansion on enrolment branches		
29	Maintaining relationships with businesses and local community		

Levels of Effectiveness

Degree of Support	Description
High	More than 10 sub-sites* and in each sub-site contains information three times the length of the screen (with 1024 x 768 resolution screen display) on average to support the organisational critical activity.
Medium	Include 5 to 10 sub-sites or more than 10 sub-sites but with information less than three times the length of the screen on average in each sub-site to support the organisational critical activity.
Low	Less than 5 sub-sites to support the organisational critical activity.

** A sub- site is the composition of Web pages which can be accessed through the linkage of a hyperlink on another Web page. It is different from sub- page, which is only a page of information.*

Levels of Efficiency

Degree of Support	Description
Level 1	The feature provides static information to support conducting the organisational critical activity.
Level 2	Not only information provision, the feature also provides at least one-way communication between users and the university when conducting the organisational critical activity, for example, online form, and FAQ.
Level 3	Not only information and communication functionality, the feature also provides data transaction between users and the university when conducting the organisational critical activity, for example, search feature.

A1.7 Web Site Evaluation Form 4

Web Site Evaluation Form 4

Category	**Description**	**Activities in this level**
Category 1 (the Web site provides effective and efficient support)	High and Level 3 in Evaluation Form 3	
Category 2 (effective or efficient support)	High and Level 2 or Medium and Level 3 in Evaluation Form 3	
Category 3 (General support)	The rest supported by the Web site and is not Low and Level 1 in Evaluation Form 3	
Category 4 (Poor support)	Low and Level 1 in Evaluation Form 3	
Category 5 (Non-support)	The activity is not supported by the Web site.	

A1.8 Overall Support Display Diagram

Overall Support Display Diagram

Efficiency			
L 3	IV:	VII:	IX:
L 2	II:	V:	VIII:
L 1	I:	III:	VI:
	L	*M*	*H*

Effectiveness

Appendix 2 Developed OCAWSEM

The Developed OCAWSEM includes thirteen components which are the Evaluation Process Instructions, Interview Guide, OCA Repository, Web Site Evaluation Form 1, Web Site Evaluation Form 2, Web Site Evaluation Form 3A, Web Site Evaluation Form 3B, Web Site Evaluation Form 4, Interview Normalisation Principles, Interview Scoring Principles, Web Prioritising Principles, Web Prioritising Principles, and Overall Support Display Diagram. These components are shown in the following subheadings from A2.1 to A2.10.

A2.1 Evaluation Process Instructions

Evaluation Process Instructions

Stage 1 – Identify Management Views:

1. Conduct interviews with senior management team, Web team, and other members referred by interviewees.
2. Record interviews.

Stage 2 – Analyse Interview Data:

1. Transcribe interviews.
2. Generate a list of organisational critical activities from interviews.

Stage 3 – Prioritise Organisational Critical Activities:

1. Use the Normalisation Principles to normalise the lists of organisational critical activities.
2. Use the Scoring and Prioritising Principles to prioritise the normalised organisational critical activities.

Stage 4 – Investigate Web Background:

1. Browse through the Web site, and answer following questions:
   - Does the Web site comprise Internet, intranet(s), and extranet(s) Homepages?
   - Is password required to access into Internet, intranet(s), and extranet(s)?
   - What are intended user groups of the Web site?
2. Then, complete Evaluation Form 1

Stage 5 – Confirm and Generate Organisational Critical Activities:

1. Start from the centre of the university Homepage, click one hyperlink and follow the hyperlink to the first level of sub-site.
2. Based on the purposes of the hyperlink and the sub-site, identify the organisational critical activities listed in the OCA Repository which this sub-site is supporting.
3. Record the name of the sub-site and how to find it in Evaluation Form 2.
4. If the organisational critical activity supported by the hyperlink is not listed in OCA Repository, add it into the OCA Repository and repeat step 3.
5. Repeat steps 1 to 4 to quick links on the top, on the side, and then to the bottom until all the hyperlinks on university Homepage are evaluated.
6. Applied steps 1 to 5 to the second level sub-sites of the Homepage.
7. Repeat steps 1 to 6 on the Homepages of intranet and extranet.

Stage 6 – Analyse Effectiveness and Efficiency:

1. Choose one organisational critical activity in Evaluation Form 3A.
2. Conduct evaluation on how effective and efficient the activity is supported by referring the results in Evaluation Form 2 and the criteria in Evaluation Form 3B.
3. Record the result onto Evaluation Form 3A.
4. Repeat steps 1 to 3 on the rest of organisational critical activities in Evaluation Form 3A.

Stage 7 – Group:

1. Based on the results of Evaluation Form 3, assign one organisational critical activity to Evaluation Form 4.
2. Repeat this process on the rest organisational critical activities in Evaluation Form 3.

Stage 8 – Prioritise:

1. Use the Web Prioritising Principles to identify the priority for all nominated organisational critical activities in Evaluation Form 4.

Stage 9 – Discuss Overall Support:

1. Compare the priorities of the organisational critical activities nominated by management and extracted from the Web site.
2. Discuss how well these two lists are matched.
3. Assign those organisational critical activities which were viewed by the management and also listed in Evaluation Form 4, into the Overall Support Display Diagram.
4. Make suggestions for the Web team to improve the Web site.

A2.2 Interview Guide

Interview Guide

Interviewee's Name:_____

Interview Time:_____

Location:_____

Statement of Ethical Issues:

- Participants will have the right to refuse to answer any particular question, and withdraw from the study at any time.
- Names of individuals and organisations will not be used in the thesis unless specific permission is sought and received. No publication of specific names of individuals or organization will be undertaken unless specific written agreement is sought and received from the named individuals.
- Data collected by the researcher will be held confidentially and securely. The outcomes of the research will be contained in a PhD Thesis for the University of Waikato University for academic purposes.

Formal Interview Questions:

1. Please describe your role, your job, and how long you have been in this job.
2. How does this university define its successes?
3. How does this university compete with other universities?

Organisational Critical Activity Statement:

An organisational critical activity is an organisational priority that is recognised as being essential to short, medium, and long-term success in that industry, has been significantly resourced, and receives regular senior management monitoring and direction.

4. Please describe what this university's organisational critical activities are? (Repeat the definition again if the interviewee forgets)
    - What is their priority?
    - How does this university support and enable these organisational critical activities, and which ones are more important?

5. Would you suggest other people who know about the organisational critical activities in this university and I can have interviews with them?

Interactive Interview Questions:

- According to your feeling, how does this university defines its success?
- What are the messages or emphasis coming down from the senior management team at the moment?
- What are the important things, top priorities, and things being concentrated on at the university at the moment?
- Are those nominated organisational critical activities you believe being conducted currently and are critical to the university's success?
- How does this university support these organisational critical activities specifically and differently from other universities?
- Does the senior management team discuss these organisational critical activities regularly?
- Does this university spend a lot of resources on these organisational critical activities?
- Which one is discussed regularly, resourced significantly, and emphasised most by the senior management team at the moment (If the interviewee does not know the emphasis from the senior management, ask his or her feelings)?

A2.3 OCA Repository

OCA Repository	
No	**Organisational Critical Activities**
1	Advertising
2	Assuring teaching quality
3	Buying supplementary material
4	Communication with businesses and local community
5	Communication with the government
6	Conducting marketing research
7	Creating university culture
8	Developing and providing strategic plans
9	Developing new courses
10	Developing new services
11	Developing new technology
12	Developing research
13	Developing staff
14	Efficient teaching and learning
15	Enhancing internal administrative efficiency
16	Expansion on enrolment branches
17	External communication
18	Facility management
19	Financial management
20	Increasing the branding
21	Internal communication
22	Maintaining partnership with other institutions
23	Maintaining relationships with previous students
24	Providing library services
25	Providing scholarships
26	Providing student learning supports
27	Providing student services
28	Recruiting domestic students
29	Recruiting international students
30	Recruiting staff
31	Retaining staff
32	Sustaining educational funding and extra funding
33	Timely provision of student personal and academic records

A2.4 Web Site Evaluation Form 1

Web Site Evaluation Form 1

Does the Web site comprise the Homepages of following domains (see *)?

Domain (Yes/No)		***Password protected?***	***Name of the Homepage***
Internet			
Intranet			
Extranet			

What are the intended user groups of the Web site?

**Definitions of Web Domains are:*

- *Internet: The Web pages can be accessed by any users and are password free.*
- *Intranet: The Web pages can only be accessed by employees of the organisation and are password protected.*
- *Extranet: The Web pages can only be accessed by suppliers or buyers of the organisation and are password protected.*

***The sub-site level:*

- *If the sub- site only presents questions, this is not counted as one level of sub- sites.*

****The Web domain:*

- *If the sub- site belongs to the domain of the university Web site, it must be fully or partially owned by the University.*
- *Departmental sub- sites will not be evaluated unless they support any university level activity.*

A2.5 Web Site Evaluation Form 2

\Web Site Evaluation Form 2 (Page 1)

No	Organisational Critical Activities	Internet Domain Supported?	Extranet Domain Supported?	Intranet Domain Supported?	Title of the Sub-site and How It Was Found?	Specific Features?
1	Advertising					
2	Assuring teaching quality					
3	Buying supplementary material					
4	Communication with businesses and local community					
5	Communication with the government					
6	Conducting marketing research					
7	Creating university culture					

Web Site Evaluation Form 2 (Page 2)

No	Organisational Critical Activities	Internet Domain Supported?	Extranet Domain Supported?	Intranet Domain Supported?	Title of the Sub-site and How It Was Found?	Specific Features?
8	Developing and providing strategic plans					
9	Developing new courses					
10	Developing new services					
11	Developing new technology					
12	Developing research					
13	Developing staff					
14	Efficient teaching and learning					

Web Site Evaluation Form 2 (Page 3)

No	Organisational Critical Activities	Internet Domain Supported?	Extranet Domain Supported?	Intranet Domain Supported?	Title of the Sub-site and How It Was Found?	Specific Features?
15	Enhancing internal administrative efficiency					
16	Expansion on enrolment branches					
17	External communication					
18	Facility management					
19	Financial management					
20	Increasing the branding					
21	Internal communication					

Web Site Evaluation Form 2 (Page 4)

No	Organisational Critical Activities	Internet Domain Supported?	Extranet Domain Supported?	Intranet Domain Supported?	Title of the Sub-site and How It Was Found?	Specific Features?
22	Maintaining partnership with other institutions					
23	Maintaining relationships with previous students					
24	Providing library services					
25	Providing scholarships					
26	Providing student learning supports					
27	Providing student services					
28	Recruiting domestic students					

Web Site Evaluation Form 2 (Page 5)

No	Organisational Critical Activities	Internet Domain Supported?	Extranet Domain Supported?	Intranet Domain Supported?	Title of the Sub-site and How It Was Found?	Specific Features?
29	Recruiting international students					
30	Recruiting staff					
31	Retaining staff					
32	Sustaining educational funding and extra funding					
33	Timely provision of student personal and academic records					

Statements: Delete repeated sub-site in the same net domain, but keep the one with shortest path.

- The name of the sub-site should be recorded from the content rather than the top left corner of the screen.
- If a sub-site contains lower level of sub-sites, which support the same sub-activity enabling the organisational critical activity, these sub-sites in the lower level are not recorded
- Counts those sub-sites which support to the organisational critical activity directly.
- The sub-site, which contains just links without any extra information, will not be recorded.

A2.6 Web Site Evaluation Form 3A

Web Site Evaluation Form 3A

No	Organisational Critical Activities	Effectiveness	Efficiency
1	Advertising		
2	Assuring teaching quality		
3	Buying supplementary material		
4	Communication with businesses and local community		
5	Communication with the government		
6	Conducting marketing research		
7	Creating university culture		
8	Developing and providing strategic plans		
9	Developing new courses		
10	Developing new services		
11	Developing new technology		
12	Developing research		
13	Developing staff		
14	Efficient teaching and learning		
15	Enhancing internal administrative efficiency		
16	Expansion on enrolment branches		
17	External communication		
18	Facility management		
19	Financial management		
20	Increasing the branding	A( ) B( )	
21	Internal communication		
22	Maintaining partnership with other institutions		
23	Maintaining relationships with previous students		
24	Providing library services		
25	Providing scholarships		
26	Providing student learning supports		
27	Providing student services		
28	Recruiting domestic students		
29	Recruiting international students		
30	Recruiting staff		
31	Retaining staff		
32	Sustaining educational funding and extra funding		
33	Timely provision of student personal and academic records		

A2.7 Web Site Evaluation Form 3B

Web Site Evaluation Form 3 B

Levels of Effectiveness A*	
Degree of Support	**Description**
High	More than 10 sub-sites** and in each sub-site contains information three times the length of the screen (with 1024 x 768 resolution screen display) on average to support the organisational critical activity.
Medium	Include 5 to 10 sub-sites or more than 10 sub-sites but with information less than three times the length of the screen on average in each sub-site to support the organisational critical activity.
Low	Less than 5 sub-sites to support the organisational critical activity.
Levels of Effectiveness B***	
High	No more than 2 sub-sites are designed inconsistently
Medium	More than half of the sub-sites are designed consistently
Low	More than half of the sub-sites are designed inconsistently
Levels of Efficiency	
Degree of Support	**Description**
Level 1	The feature provides static information to support conducting the organisational critical activity.
Level 2	Not only information provision, the feature also provides at least one-way communication between users and the university when conducting the organisational critical activity, for example, online form, and FAQ.
Level 3	Not only information and communication functionality, the feature also provides data transaction between users and the university when conducting the organisational critical activity, for example, search feature****, online payment, change of passwords, or exchange of personal information.

** This criterion is used to evaluate how the Web site is supporting all organisational critical activities except for branding.*

*** A sub-site is the composition of Web pages which can be accessed through the linkage of a hyperlink on another Web page. It is different from sub-page. A sub page is only a page of information.*

**** This criterion is used to evaluate how the Web site is supporting branding activity. For evaluating branding, both Levels of Informativeness A and B are required to complete. Then, record both results to Evaluation Form 3A.*

***** The search feature is the feature which supports the organisational critical activity rather than the general search feature of the Web site.*

A2.8 Web Site Evaluation Form 4

Web Site Evaluation Form 4

Category	Description	List Activities in this Level Alphabetically
Category 1 (the Web site provides effective and efficient support)	High and Level 3 in Evaluation Form 3	
Category 2 (effective or efficient support)	High and Level 2 or Medium and Level 3 in Evaluation Form 3	
Category 3 (General support)	The rest supported by the Web site and is not Low and Level 1 in Evaluation Form 3	
Category 4 (Poor support)	Low and Level 1 in Evaluation Form 3	
Category 5 (Non-support)	The activity is not supported by the Web site.	

A2.9 Normalisation, Scoring, and Prioritising Principles

Interview Normalisation Principles

No	Principles
1	**Check the terms** nominated by interviewees with the terms provided in the OCA Repository and the definition of organisational critical activities.
2	**Delete** the activity which is not an organisational critical activity.
3	**Add** the activity which is an organisational critical activity and not provided in the OCA Repository.
4	**Divide** the activity which can be divided into two or more organisational critical activities.
5	Write **"F"** beside the activity which is **functional** organisational critical activity.
6	Write **"P"** beside the activity which is **part** of an organisational critical activity.

Interview Scoring Principles

No	Principles	Scoring
1A	The activity contributes to the success of **university level** and is revealed by one interviewee **explicitly**.	20
1B	The activity contributes to the success of **university level** and is revealed by one interviewee **implicitly**.	15
1C	The activity contributes to the **functional level** success and is revealed by one interviewee **explicitly**.	15
1D	The activity contributes to the **functional level** success and is revealed by one interviewee **implicitly**.	10
2A	The activity supports **part** of an OCA and is revealed **explicitly**.	10
2B	The activity supports **part** of an OCA and is revealed **implicitly**.	5
2C	The activity is a **functional** activity, supports **part** of an OCA, and is revealed **explicitly**.	5
2D	The activity is a **functional** activity, supports **part** of an OCA, and is revealed **implicitly**.	2

Interview Prioritising Principles

No	Principles
1	The activity nominated by **more interviewees** is more critical.
2	The activity nominated by the interviewee who is the **senior management member** is more critical.
3	The activity which contributes to the **success of university level** is more critical **than** the **functional level** activity mentioned by the interviewee who is responsible for it.
4	The activity nominated **explicitly** is more critical than the one nominated **implicitly**.
5	The activity **prioritised higher** by the interviewees is more critical.
6	The activity **urgently needed** for the university is more critical.
7	The activity which provides **more contribution** to **university's success** is more critical.

Web Prioritising Principles

No	Principles
1	The organisational critical activity in **higher category** has higher priority than the one in the lower category.
2	The activity, which is supported by **more sub-sites**, has higher priority.
3	If two or more than two organisational critical activities are supported by the same number of sub-sites and ranked in the same levels of Interactivity, the one supported by **more sophisticated Web features** will have higher priority.
4	If two or more than two organisational critical activities are supported exactly by the same sub-sites, the one supported by **more information** will have higher priority.

A2.10 Overall Support Display Diagram

Overall Support Display Diagram

Efficiency			
L 3	IV:	VII:	IX:
L 2	II:	V:	VIII:
L 1	I:	III:	VI:
	L	*M*	*H*

Effectiveness

Appendix 3 Backgrounds of the Field Cases

The field cases chosen in this research are all universities in New Zealand. This appendix presents the backgrounds of these universities. Due to the secrecy concerns, the names of the universities have been disguised, and the sequence of the presentation made here is different from the sequence of the field case studies conducted. In addition, the disguised names used in this appendix are different from the one used in the body text of this thesis.

A3.1 University 1

University 1 is located in the same city with University 3, which is the South Island and with the lowest living cost among large cities in New Zealand. Although, they are situated in the same city, University 1 is much closer to the city centre than University 3. Thus, it does not have much difficulty as University 3 in attracting students. However, this does not mean that University 1 has not had any difficulty in student recruitment. Despite being in the second largest city, University 1 does not have as much growth as those universities in other cities, particular in the North Island while there has been a significant growth of tertiary education industry in the past several years. It is one of the universities with the lowest amount of growth. Because it also has much more space in the campus in comparison with other universities, there is still a potential for it to expand. Thus, the major challenge to University 1 is to attract students.

To attract students, University 1 has several strategies. Firstly, it keeps emphasising the science studies, particularly engineering studies which possibly is the strongest among others, by conducting more postgraduate research activities in this area. Secondly, it maintains a strong collaboration with other local institutions in terms of marketing. They work together to attract students to come to the city. Thirdly, University 1 retains students to continue studying in postgraduate degrees by providing a range of generic degrees, which are broad and fundamental discipline degrees. In other words, they do not focus on providing those narrow and specialist degrees in the undergraduate studies. Rather, they place emphasis on fundamental and broad disciplines. Thus, undergraduate students will have much more choice after their undergraduate studies. The results show that University 1 has a high retention

rate of the students to continue in the postgraduate studies due to offering these generic degrees. Now, University 1 is restructuring its management across the university and delegating the leadership into college level in order to perform more effectively and efficiently.

In regard to its Web site, most of University 1's Web initiatives are developed in-house except a few of sub-sites from outsourcing companies. They have two levels of meeting in regard of Web site. One is a reference group meeting, and the other is a steering group meeting. In the reference group meeting, a number of strategic people around the university are gathered and provide strategic advice to the Web site. The steering group meeting, basically including the Director of IT, the Librarian, the Marketing Manager, and the Web Project Manager, then discuss more practical issues such as the priorities of Web projects and the major problems of Web sites and how to fix them.

University 1's Web site consists of Internet, intranet, and extranet sub-sites and provides services to students, staff, and visitors. In particular, it has several sophisticated features, which are popular among universities, including online enrolment, WebCT for e-learning, and academic status checking. It contains many more Web pages and is much complicated than the Web site of University 3. Therefore, the challenge is to improve the Web design, make it to be easy to navigate, and to identify the out-of-date information from thousands of pages and amend it. Another challenge is to enhance the consistency of the look of their sub-sites. It is because the design of Web site was devolved to each department. Thus, they do not design the sub-sites consistently. This has effect on their branding and they urgently need to convert these pages into a consistent form.

Currently, one critical Web project in University 1 is converting their Web pages into a consistent format. The Liaison and Marketing department is in charge of this task. They pull the control of the Web design from departments. Then, the Web Centre provides certain types of standard templates as well as policies. Departments are responsible for updating the Web content including the content in WebCT. In other words, the department provides information to the Web system while the university controls its design and technical aspects. The other critical project is to enhance the usability of the Web site, particularly for their intranet Web site. This requires University 1 to restructure the level of their sub-sites which had a total

number of a 180 in 2002, deleting the out-of-date as well as repeated information, and positioning proper hyperlinks across the Web site. They believe these projects are ongoing projects and will enable the success of their Web site.

A3.2 University 2

University 2 is one of the leading universities in New Zealand in terms of attracting external research funding. However, the city has a decline of the population due to the cold weather and being away from some major cities in terms of working opportunities since 90s. Despite its success, the decline of the population in the city is a major challenge to University 2 to attract students. They cannot focus on attracting students locally, but from other localities. Therefore, how to attract students from other cities has been a major challenge to University 2.

To deal with the challenge, University 2 tends to build a young and attractive studying and living environment for students. On one hand, it has been investing significantly on its campus appearance including all the buildings and a multi-million dollar library. It hopes to attract students by providing these attractive buildings. On the other hand, it also provides plenty of quality accommodation facilities to those students coming from other cities. The result is that more than three quarters of the students in University 2 come from other towns or cities and about 65 percent of the first year students are supervised in their accommodation by the university.

In addition, University 2 tends to create a diverse culture on its campus by keeping two policies. Firstly, they set 12 percent as the cap on the overseas student number, which is much lower than other universities. Therefore, local students can feel familiar with the environment and overseas students can experience the New Zealand culture. Secondly, they will not enrol more than 25 percent of overseas students from any one country. Thus, they have a diverse culture in the studying environment. Currently, University 2 has 25 percent of students from China and the other 25 percent from USA. These strategies help University 2 grow steadily even when the overseas market is dropping recently.

In regard to its Web site, University 2 did not develop their Web site in-house until 2000, when they set up a Web Office and employed their own Web specialists. Overall, there are four management groups involved in the Web site development; academic departments, Web Office, the Web Advisory Committee, and particular functional group. Each academic department is responsible for their Web

development only, whereas the Web Office is responsible for most of the university level sub-sites and also overseeing the designs of departmental sub-sites in terms of consistent look and feel and proper features. At the highest level, the Web Advisory Committee is in charge of the strategic direction of Web development as well as the policy-making. Some of the functional groups are also developing their own sub-sites with minimum support from the Web Office for particular purposes. For example, the Finance Office owned their sub-site because of the security concerns; the Career Advisory Services controlled their special system called Career Hub; and the Purchasing Office is totally in charge of their purchasing system.

For providing services to students, an e-learning system called Blackboard and a Personal Information Management System (PIMS) are integrated into University 2's Web systems. These are sophisticated and interactive features which can provide fundamental support for both teaching and learning here.

In order to enhance the capacity of its library, University 2 joined a consortium with other universities to share a large library database. They also plan to implement a university wide GroupWare system, a new system for charging students for Internet usage, and an online enrolment system. Although they have been working on enhancing the usability issue since 2000, some students still can be lost in such a diverse and massive Web site. They believe that their Help Desk feature plays a key role in assisting students to fulfil their tasks.

The philosophy of the Web design in University 2 is that they do not require that all the Web pages across the university are the same in terms of colours, images, and locations of hyperlinks. However, any Web page should still be consistent with others for the look and feel and should support university's brand. Currently, the Web Office is overseeing this issue. Yet, as the number of the pages in their Web site is growing continuously, it becomes more difficult to maintain and update them. Thus, the major Web task now is to implement a Web content management tool and promote it to the units across the university. They believe that not only the maintenance task becomes easier, but also they can evaluate and control information efficiently.

A3.3 University 3

University 3 has a well established reputation in agricultural studies and research, and is the first institution in Australasia offering a degree in agricultural study. However,

it is located in a rural site from the city centre. The farther distance away from the city centre causes University 3 to always be struggling to attract students. Furthermore, with fewer students, it has fewer funds which can be spent on marketing to compete with other universities.

To overcome these weaknesses, University 3 has always been very keen to implement new marketing initiatives, for example, it was the first university to advertise on TV; and the first to provide athletic scholarships. Although new marketing initiatives can only give a short lift, not a long lasting strength, other universities may adapt them later. University 3 has no choice, and they must continue developing new marketing initiatives to attract students from other parts of the country.

On one hand, University 3's strategy focuses on developing new marketing initiatives to overcome its weakness. On the other hand, the well established reputation in agricultural studies and research has always been a major strength. However, the characteristics of the tertiary market in New Zealand have changed since the 1990s. The number of overseas students in the tertiary institutions is increasing and fewer domestic students are interested in agricultural studies. Currently, more students favour business or commerce-related programmes. This happens to not only domestic students but also, especially, overseas students. The competency of a well established reputation for agriculture can no longer sustain a guaranteed marketing advantage.

To overcome this, University 3 decided to provide a programme which is market oriented. It shifted its teaching focus from agriculture to business and commerce. No question, every university in New Zealand is offering business related programme. However, University 3 develops new programmes based on the agricultural programmes and then grows them into business areas. Those programmes therefore are interdisciplinary, a mixture of agriculture and business, unique, and applied. They provide significant help to University 3 in regaining its marketing advantages. Now, students enrolled in business-related programmes are more than those in agricultural studies. More than forty percent of the students are overseas students.

In regard to its Web site, University 3 has a limited budget for the development and maintenance of its Web site because the number of students is small.

Investing budget on inventing new Web initiatives has happened less. In contrast, they most often adapt successful and effective Web projects from others. For example, while some other universities have implemented intranets for several years, University 3 has not until they saw that a more mature intranet model which gave effective results. University 3 stopped planning its online enrolment project because they saw the difficulties faced by other universities when conducting this project.

However, University 3 has been implementing the intranet systems since early 2004. The main reasons are two. Firstly, as the Web site became more complicated, it was more difficult to navigate and find information. University 3 needs to aggregate relevant information required by specific users into different intranet Web sites. Secondly, there is an increasing need for adding sensitive information onto the Web. This kind of information cannot be offered through Internet Web. Anyone can access the sensitive information without any password protection.

Currently, the intranet systems include two Web sites, which are staff and student Web sites. More relevant hyperlinks to different user groups and sensitive information can be gathered into the sub-sites hyperlinked by the intranets. These sub-sites not only help staff to find information more easily, but also keep the sensitive information confidential.

Although the Web sites are supporting business processes, the purposes of Internet and intranet sub-sites are different. The Internet sub-site serves as a marketing and advertising tool and is used to attract prospective students. The promotional publications can be found here. It is public oriented. There is no password required to access information. Everyone can access it.

The intranets are different. They are internal communication tools and used to increase the efficiency of University 3. By using the intranets, students and staff can spend less time on searching information because the Web hyperlinks relevant to the activities conducted by them frequently are integrated here.

In order to run these three Web sites, University 3 has divided the work of Web administration into three levels. A Web Steering Committee has formed and meets regularly. It includes managers and specialists from different functional groups, such as IT Director, Marketing Manager, and Web Manager. Their responsibilities are to deal with strategic issues and decisions related to the Web site. In the second level, the Marketing Department, lecturers, and tutors are responsible for the content of the

Web site. In the third level, the Web Developer is responsible for the design and technical issues of the Web sites.

A3.4 University 4

University 4 is the only university in the local region. The management studies and computing studies were ranking as top in terms of Performance-Based Research Fund (PBRF) results. It is also the university which has the highest proportion of Maori (indigenous) students and has a stronger relationship with the agents in China for the cooperation of recruitment. Furthermore, University 4 is innovative in terms of developing the new programmes, for example, the first university with a school of Maori and Pacific Development, the first university to teach tourism, woman and gender studies, and a new approach to sociology. Despite these strengths, University 4 has a lower growth rate in comparison with other universities in the past few years. It even suffered a decrease of student numbers in 2004 that comes from several challenges.

Firstly, University 4 has a more decentralised way of management in the areas such as research, recruitment, and IT services. Since 1999, the government removed a funding cap and let universities compete on enrolment numbers in order to gain funding. University 4 had the difficulties to cope with the competition within such a free market because it would be harder to coordinate with many decentralised units and react to the change quickly. Second, University 4 has lost many academic staff members to University 6. This is because University 6 needs more quality academic staff members to enhance its research abilities. Therefore, it offers more attractive conditions to attract staff from University 4. Thirdly, University 4 also lost many students to the universities with more attractive campuses, for example, University 5 and University 2. As believed by some interviewees in University 4, these young college graduates prefer to choose the university which has a more attractive environment. Because University 4 just had its new Vice-Chancellor recently, how to overcome these challenges in order to retain a reasonable growth has become a major task for him.

Currently, the new Vice-Chancellor has developed several critical visions. To this end, they will promote and grow more on those excellent areas of studies. In particular, they may close down those studies which have difficulties in enrolment. University 4 is also adding much more effort to research activities in order to gain

more research funding and research projects both nationally and internationally. To become a distinctive university, they have been constructing many attractive buildings and upgrading the old buildings. They are also focusing on cost reduction at the moment, which results in a downsizing on the management. In addition, the new Vice-Chancellor has taken a more centralised managerial style. This could allow him to implement new visions more easily. Currently, University 4 is still redefining its own strengths and translating the new visions into lower level objectives. Thus, it is interesting to oversee how these initiatives work.

In regard to its Web site, University 4 started its Web site in the late 1990s for the purposes of branding and marketing. Since then, the Web site has evolved to meet the increasing needs both internal and external to the university. As the number of Web pages has become large, they separate the Web site into public, portal, and academic department sub-sites, and which are the responsibility of different management groups. The Marketing Department is responsible for the public sub-sites, the so-called "gateway" pages in terms of both content and look and feel. Each department is responsible for the content of their departmental sub-sites and their portals. Differently from other universities, University 4 only has one password protected and public portal, and this portal does not support actually teaching or learning activities. The rest of portals are developed by various departments. This is probably because they have fairly devolved management style.

The philosophy here is to solve the Web problems individually and have a decentralised management on the Web. Therefore, University 4 does not have a particular staff member who can oversee the whole Web site, and also they have various kinds of Web designs. The result is that they received a lot of feedback from users in regard to the difficulties of searching for information. This has pushed them to establish a Usability Lab which is dedicated to improve the usability of the Web site. In addition, they also found that the decentralised Web development has caused an inconsistency on the Web pages across the university Web site in terms of the look and feel. To deal with this, they have been implementing a content management system and utilising this system to convert these inconsistent pages into proper forms.

The management in University 4 has started realising that the Web site is becoming more critical to support their strategies. The support from the higher level of management has increased. This support includes more budget and more senior

members directly or indirectly involved in the meetings. They also started to establish a Web committee to align the Web initiatives with the university objectives. To further advance their Web site, they are currently developing two password protected portals, which are a new student portal and a new staff portal, in the university level. It is because they only have Internet portal for students and staff at the moment. The new portals will contain relevant information and frequent used features for students and staff. They believe that the new portals will build better relationships with the users.

A3.5 University 5

University 5 has three campuses which are spread through out the local region. The largest campus is situated in the city centre, with a small one on the north and a research-oriented centre in the south of the region. The geographical advantage does help it attract students. In addition, it is famous for its medical, engineering, and business studies. The high reputation in these areas is also an advantage for them to attract students.

Although University 5 and University 6 are in the same region and involved in a certain degree of competition particularly in the city centre, they are regarded as different styles of universities and competing in different academic areas. University 5 has more research activities and receives much more research funding. In addition, its teaching activities are mainly based in the large lecture rooms. However, University 5 still has two major challenges. Firstly, it has to compete with other universities which are also excellent in the areas of medicine, engineering, and business. For medicine, University 2 also has a very large medical school. For engineering, University 1 is also famous for its engineering studies. For business, University 4 is also well known for its management studies. Secondly, the decrease in the overseas market causes University 5 to consider carefully on how to maintain its current enrolments.

In order to sustain itself, University 5 has been pursuing three major strategies. Externally, it focuses on shaping its international outlook and building its international reputation through a range of cooperation with overseas institutions. In particular, they try to promote themselves as an internationalised university rather than a local university. Internally, University 5 is working on the enhancement of the quality of the student services. For example, it recently received and invested a large amount of funding to enhance the infrastructure of its Business School. Both of these

strategies are aligned with the third strategy which is a growth strategy. Since the funding from the government is decreasing, they have to gain more enrolments in order to sustain themselves financially. In results, University 5 has become more internationalised and its enrolment has steadily grown in the last few years.

In regard to its Web site, University 5 divides its Web site into two major domains – the university site and the faculty site. The Web Manager is responsible for the majority of university sub-sites, whereas each faculty controls their own sub-sites. Faculties can either develop by themselves or buy packages from external firms. Most faculties in University 5 have their own intranets. Although each faculty builds its own sub-sites, all the sub-sites are coordinated through the Web Manager who is also responsible for ensuring the overall strategic direction and quality of the Web site. Particularly, University 5 separates the Web users into two groups – publishers and readers. The Web Manager has responsibility for the quality assurance from the reader's perspective and the automation of the content maintenance from publisher's perspectives. The technical resources and support are not provided by the Web Manager, but the IT Department.

The Web site in University 5 includes Internet, intranet, and extranet sub-sites. As they are becoming an internationalised university, they believe that the Internet Web site is the front door to the university for people overseas. In order to seek extra funding, University 5 also has a small team from the public relations area developing and maintaining its alumni sub-site. The main purpose is to retain the relationship with the alumni and encourage them to donate. The alumni sub-site enables the communications between alumni through Yahoo Group feature, which is a free and interactive feature. The same as other universities, University 5 also has an e-learning system, which was developed and is maintained by a specific team. This system can support both teaching and learning-related activities.

University 5 is currently conducting several key projects in order to overcome the shortages of its Web site. From the publisher's perspective, they are implementing a content management system. When the content management system is totally implemented, the updating process will become much easier. At the same time, they are also progressively training those publishers within the university on how to update the Web pages. From the reader's perspective, they have established a group for the improvement of usability. This group evaluates the Web site, identifies some areas

which students want them to improve, and generates some useful suggestions for the improvement on their Web site. Another project is that they are redeveloping the staff intranet. At the moment, the entrances to their intranet sub-sites are scattered widely through out the cyber places. They intend to integrate these entrances into one place which will be the main portal for staff in the future. Except for these technical projects, University 5 is also shifting the ownership of the Web site from being more IT-driven to being business-driven. Therefore, many strategic reviews on the Web site are underway. They expect that the Web site will play a more strategic role in the future.

A3.6 University 6

University 6 was a polytechnic until 2000. Its location in a large city is the major strength to attract students, in particular overseas students. In the past few years, it has had a large growth on the enrolment. Despite the short-term success, University 6 does have three major challenges which are affecting its long-term success. The first one is the relatively lower reputation because of its much younger age of being a university. Most public still have the sense that it is a polytechnic rather than university. The second comes from its major competitor – University 5 – which is located close to University 6. The third one is that, as a youngest university, University 6 does have a longer way to work on its research capability. Because the research funding is becoming more critical to all the universities in New Zealand, how to enhance its research abilities is a challenge.

In order to enhance its research capability, University 6 has been focusing on recruiting leading researchers in various disciplines, as this is the quickest way to enhance its research reputation. From a more long-term perspective, it has started investing more resources into research as well as teaching more degree level courses, particularly in the postgraduate level, since it became a university. However, the concentration on the degree level courses with certain level of association with research activities is the dilemma to University 6. On one hand, it is the youngest university and has a clean research culture to adopt changes in terms of developing policies and researching in new areas. The shift of emphasis from teaching to research is much easier than in other universities. In order to increase its research capability, University 6 surely needs to act this way. However, the major concern is that they could lose its strength at the same time. This is because University 6 is well known for its applied and practical studies in its polytechnic history. Students complete those

applied non-degree courses or low level degrees, and most of them can be employed easily. When offering more, higher level degrees which comprise research-led courses, it has a risk of losing the students who are seeking more applied courses.

Concern for this dilemma, University 6 tends to take a balanced approach. It still provides more degree level and research-led courses, yet they are new to the field. This can avoid competition with its major competitor in the city centre – University 5. On the other hand, University 6 also keeps offering some popular applied courses in order to gain more funding to upgrade its research infrastructure. In addition, it focuses on attracting Maori (indigenous), Pacific, and Asian students as these groups of population are growing in the city. In results, University 6 has become one of the universities with highest growth rate in New Zealand since 2000.

University 6's Web site is slightly different from other university Web sites because their philosophy is to create their own style rather than adopt styles created by others. For example, their student portal is unlike others, it contains not only learning related features, but also a number of attractive and entertaining features such as virtual cards and a trading post. In comparison with most student portals which only provide services to current students, theirs can also be browsed by prospective students and enable recruitment. In addition, they integrated an attractive feature through which users can monitor real squids live through the Web site. They are the first among the university to invent this feature to attract prospective science students.

The management of Web site in University 6 is also different from others because they adopt a more centralised style. Before a Web page is uploaded to the server, the development tasks are devolved. Any department can develop their own Web pages by their own specialists or a support from the Web Centre. However, once the prototype of the Web page is completed, it has to be checked by the Web Centre in terms of functionalities, quality assurance, structure, and consistencies before it can be uploaded. The Public Affairs Department also has the right to disagree with any piece of information on the Web site if they feel it is inappropriate.

The same as other universities, University 6 has to work hard toward keeping its Web site easily navigable, to express a consistent look and feel, and to be maintained efficiently. Several crucial projects are currently under way. Firstly, they are developing a new student portal which provides services to current students only and will be password protected. Most frequently used information and features will be

integrated into that portal. This can save searching time for students. Secondly, they are implementing content management software at the moment. This will make their Web maintenance more efficient. Thirdly, the Web Centre is working on updating the images, colours, and look and feel on all the Web pages in order to support their brand. This project is also critical to promote their new brand – a university which is different from the old brand that they had established before – a polytechnic.

A3.7 University 7

University 7 provides teaching in three large campuses in the cities scattered in North Island. It also provides the largest extramural studies among the universities in New Zealand. Currently, its agriculture and horticulture programmes are among the top in New Zealand. The only veterinary programme in the Southern Hemisphere is offered here.

The multiple campuses approach and providing intensive extramural studies do give University 7 several advantages, for example, better reach to potential students, easier access to current students, offering more choices for studies, and higher loyalty from the students. However, they also cause several challenges to University 7. For providing extramural studies, they have to compete with the other major competitor –a polytechnic based purely on extramural studies. In addition, the extramural teaching is more costly to deliver than campus studies. The multiple campus approach causes University 7 to adopt a decentralised management style, which increases the difficulty in the communication between campuses. It also requires University 7 to compete in three different kinds of environment by making separate strategic plans and policies. In addition, University 7 has a relatively higher percentage of overseas student numbers. Thus, it receives more impact from the drop of overseas students recently. Investing more resources on the extramural and undergraduate teaching means they have fewer resources invested in research. This is probably why they were ranked at seventh in the PBRF ranking.

Currently, University 7 is promoting the characteristics in each campus rather than promoting University 7 as a whole. For 7A campus, they promote its business studies while the 7B campus is the veterinary and agriculture study centre with a quality learning environment, and the 7C campus is the musical study centre. Students therefore know more about various characteristics of University 7, and what they can study here. University 7 also concentrates on attracting more research projects and

funding, and improving its internal efficiency in order to overcome a lower response time resulting from the decentralisation. For extramural studies, they target providing studies to the poorer families around the country. This is not only for recruitment, but also for social responsibility purposes and seeking more talented students. Despite its PBRF result, University 7 grew its student enrolment gradually before the overseas market dropped and subsequently maintained its numbers.

University 7 has a more complicated Web site than other universities have because it not only includes the departmental sub-sites, but also covers three sub-sites for the separated and decentralised campuses. Moreover, the size of the site has grown dramatically in the past few years, and in a particularly non-coordinated way because no one was diligently in charge of the whole Web site. Therefore, they had difficulties to manage a harmonised Web site. To overcome this, they hired a Web Content Manager in 2004 to oversee that the integration of sub-sites is properly carried out. They also have a Web committee to translate organisational desires into Web objectives, propose Web projects, assign resources, and monitor their achievement.

Similar to some universities, University 7 has started to differentiate the Web site from an IT function to a business function. Thus, the control of the content is being transferred from the IT Department to business departments including Marketing Department, Public Relations Department, and several others. The IT Department becomes more infrastructure maintenance and technical support-oriented. Currently, their Web site includes Internet, intranet, and extranet domains for providing services to various kinds of users. Differently from most common designs, they have only one portal that can be accessed by both students and staff. Students and staff will have slightly different content for the sub-Homepages after they log in. This portal also provides e-learning and Web mail features. However, the Web site has mixed Internet and intranet resources. Only those who are familiar with the structure can find information promptly. As the number of the users has been increased, University 7 has to deal with this difficulty urgently.

Several important projects are under way in University 7 to enhance its Web site. Firstly, they are deciding whether the information should be Internet-oriented content or intranet-oriented content, in particular, based on who should access the information. They then assign the information into proper sub-sites and restructure the sub-sites. This project also helps increase the usability of the Web site. Secondly, a

content management system is being implemented in order to centralise the flow of Web information and the information update. In addition, the system can be used to develop a consistent Web format in the future. Thirdly, they are enhancing the ability of the Web site to support research activities as research is becoming more critical to University 7. The last important project is improving the delivery of information to international students, extramural students, and the business communities.

A3.8 University 8

University 8 comprises four campuses. It is famous for its politically-related courses in the country, and the political courses are being uniquely offered by University 8. In addition, University 8 is also famous for its music studies. Another advantage is that University 8 has built a strong linkage with a government-funded research centre, and industrial research limited centre.

University 8 had huge financial deficit in 1999. Due to a dramatic increase in the tertiary market since 2000, University 8 also increased its student number sharply, particularly the overseas student numbers. It has a higher growth rate than most of other New Zealand universities. The increase of student numbers helped University 8 recover its deficit. Yet, this increase also causes a challenge. Since 1999, University 8 has increased its student numbers by 40 percent, and currently it has reached its capacity. How to fit more students in such crowed capital city is a challenge to University 8. In addition, the dramatic increase may also lower its academic standards.

Due to a limitation of expansion, University 8 is not aggressive on growth any more, but aiming for a minimum level increase (about 2 percent) in order to support the upgrade of their buildings and other facilities. In other words, the issue is how to sustain rather than expand. University 8 has strategies to help sustain its growth. Firstly, it takes a more cooperative approach with the major competitor – University 7, in Wellington. They share the infrastructure and other resources for certain courses. Secondly, it will focus on attracting more Maori, Pacific, and Asian students in the future. As the percentages of these groups are increasing, University 8 has to tailor its services to encourage them to enrol. In addition, this is also due to the social responsibility concern. Thirdly, University 8 will continue improving its internal efficiency and the effectiveness of its spending. They believe this is why they can recover from a financial deficit and also will maintain their successes in the future.

University 8 is the same as most of other universities for separating the management of Web site into corporate level and sub-site levels. The Marketing Department is responsible for the content of corporate Web site, while the departments are in charge the content of sub-sites. Yet, the difference is that the Public Affairs Department has more involvement in the Web management for charging the structure development and changes. In addition, the Marketing Department has a closer relationship with the IT Department. This is because the IT Department is responsible for development and maintenance of the Web database and the Marketing Department is also responsible for the interface development. They have a regular Web meeting to discuss how the physical infrastructure can actually support the functions of the interface.

There are more than three hundred pages on the top level of the structure, in the corporate Web site. All other sub-sites are under these pages. In order to keep the simplicity for both users and the Web developers, University 8 differentiates the Internet pages and password protected pages by the directory of Web address. That means all Internet pages are under the same directory while the password protected pages are under the other directory. In addition, the design of the Web site is question-oriented. Rather than providing a list of hyperlinks only, the Web site supplies a range of frequently asked questions, and the questions are hyperlinked. Users can click a particular question to be referred to a proper sub-site. Because University 8 has a strict Web policy, all the university information on the Web has to comply with it. Thus, they have a more consistent Web design.

Currently, University 8 is improving its Web site in several aspects. For the usability, they are working on shifting those Internet pages which are accessed frequently by students and staff, onto student and staff portals. After the usability is enhanced, the next step for them is to improve the outlook of the Web pages. For efficient Web management, they are also implementing a content management system led by the Marketing Department. This system will provide various templates which can be customised for the departments across the university. Therefore, the next challenge is for them to redesign the whole Web site and assist other Web staff in a number of departments to operate the templates and the system.

Appendix 4 Thematic Structure of Case Analysis

The thematic coding technique has been carried out to analyse the semi-structured interview data. Thematic coding is a process of coding qualitative information with explicit and particular themes. A theme is a pattern found in the information that at minimum describes and organises the possible observations and at maximum interprets aspects of the phenomenon (Boyatzis, 1998). The themes provided in the thematic coding process enable qualitative researchers not only to spend time on analysis more efficiently, but also to understand the context more clearly (Carley, 1994; Rowley, 2002). The coding process also enables case investigators to explore the interview data or field notes deeply (Debu & Pare, 2003; Miles & Huberman, 1994).

The theme can be interchangeable with the code under some circumstances. In order to avoid confusion, this research made a clarification here.

- The theme is the same as the code when they both represent the minimum aspects of the phenomenon. For example, the code utilised in the final coding process can be called a theme or a code.
- The theme is different from the code if the theme represents the generic aspects of the phenomenon. For example, the theme used to include a number of themes or codes employed in the coding process is not actually used in the coding process.

According to this clarification, the code can be considered as a "lower-level" theme. In contrast, the theme can be considered as a "broad category of codes" or a "generic code". Thus, a theme can include a number of codes. The code is the minimum level of theme which is utilised in the thematic coding process.

There are various ways to develop themes. For example, they can be derived from different sources, such as the conceptual framework, research questions, hypotheses, problem areas, or key variables (e.g. Benbasat et al., 1987; Miles & Huberman, 1994) or can be developed through the examination of the data without firm preconceptions of the relevance in concepts and hypotheses (Strauss, 1987; Walker, 1985). This research adopted Flick's (2002) theme development process. Flick (2002) adopted some techniques in Strauss's (1987) open coding procedure, and

suggested a systematic process to develop themes in thematic coding. This process requires first open and then selective coding techniques to be applied in the first case. After the first case study, the developed themes are applied to other cases.

Based on Flick's (2002) process, the development of the themes of this research includes two steps. Firstly, the coder reads through the interview transcribed in the first case study, analyses it, and then generates as many codes as possible in order to answer the relevant research questions. Secondly, the coder identifies the relationships between codes, merges them, and structures the codes into the proper themes. Then, these codes and themes are recorded in a template which will be the basis for the coding process in the rest of the case studies.

However, the themes and codes listed in the template produced from the first case study have been improved in the following case studies (e.g. add new themes/codes, delete inappropriate themes/codes). This is because this research needs not only to elicit lists of OCAs from management, but also to explore and understand the notion of OCAs continuously in the case studies. Thus, the themes or codes listed in the template were changed accordingly when a new understanding on the OCAs was found. The themes and codes utilised in the final testing case are listed in Table A1.

Table A1 *The themes and codes utilised in the final testing case*

Themes	**Codes Under the Theme**
1 University Background	
	1.1 The definition for a successful university
	1.2 The ability to compete with universities
2 Nominated OCAs	
	2.1 Explicit OCAs
	2.2 Implicit OCAs
	2.3 Priority of nominated OCAs
	2.4 Activities supporting OCAs
3 Lessons about OCAs	
	3.1 Prioritising method
	3.2 Characteristics of OCAs
	3.3 Useful terms to elicit OCAs
	3.4 Confirmation on their nomination

Glossary of Special Terms

Developed organisational critical activity Web support evaluation methodology (Developed OCAWSEM): The OCAWSEM developed based on the improvements made to Prototype OCAWSEM in a series of case studies based on ICD in this research.

Developing Case Studies: The first seven of the eight case studies conducted in this research. The purpose of conducting the Developing Case Studies is to develop the Prototype OCAWSEM.

Evaluation Process Instructions: The instructions provided in the OCAWSEM in order to help the use of other components of the OCAWSEM systematically and efficiently.

Formal Interview Question: The interview question which is crucial to elicit OCAs from management and must be asked during the interview. Formal Interview Questions are listed in the Interview Guide.

Interactive Interview Question: The interview question which should be posed only when the interviewee has the difficulties in answering the Formal Interview Question. Interactive Interview Questions are listed in the Interview Guide.

Interview Guide: The guide which should be utilised to elicit OCAs from management during the interview. The Interview Guide includes Formal Interview Questions, Interactive Interview Questions, a definition of OCAs, and an ethical issues statement.

Interview Normalisation Principle: The principles which can be used to normalise the terms of OCAs given by interviewees.

Interview Prioritising Principle: The principles which can be used to prioritise the OCAs nominated by different interviewees.

Interview Scoring Principle: The principles which can be used to place scores on the OCAs nominated by interviewees.

Iterative case design (ICD): A research design which utilises a series of case studies through an iterative learning cycle to develop a prototype. When adopting ICD, each case study not only includes the data collection and analysis stages which are suggested for conducting the case studies based on the traditional multiple-case design, but also includes another stage – the reflection stage.

OCAWSEM Developing Process: The purpose of this process is to develop and improve the Prototype OCAWSEM. The outcome of the OCAWSEM Developing Process is the Developed OCAWSEM. The OCAWSEM Developing Process includes the process of conducting the seven Developing Case Studies in this research.

OCAWSEM Development Process: The purpose of this process is to further improve the Prototype OCAWSEM into a valid and reliable OCAWSEM. The OCAWSEM Development Process includes two types of process – the OCAWSEM Developing Process

and OCAWSEM Testing Process. The OCAWSEM Development Process includes the process of conducting the eight case studies in this research.

OCAWSEM Testing Process: The purpose of this process is to test the Developed OCAWSEM. The OCAWSEM Testing Process includes the process of conducting the Testing Case Study in this research.

Organisational critical activity (OCA): An activity which must be conducted by the organisation constantly in order to be successful in the industry. It represents an organisational priority that is recognised as being essential to short, medium, and long-term success in that industry, has been significantly resourced and receives regular senior management monitoring and direction.

Organisational critical activity Web support evaluation methodology (OCAWSEM): The methodology which can be utilised to evaluate the support made to OCAs from Web sites, and can then provide suggestions to improve Web sites for better support.

Overall Support Display Diagram: The diagram which can be utilised to demonstrate visually the current overall support made to OCAs from Web sites and how the Web sites can be improved in the future.

Prototype organisational critical activity Web support evaluation methodology (Prototype OCAWSEM): The prototype OCAWSEM proposed based on the theoretical foundations discussed in the Chapter 2 of this thesis.

Research Design: An action plan for getting from the research questions to conclusions.

Research Framework: A detailed research plan which is used to achieve predefined tasks of the research. A Research Framework is well grounded in established theories and concepts.

Research Method: A systematic way of collecting evidence and indicating the types of tools and techniques to be used during data collection and analysis.

Research Methodology: A generic approach embodying a particular style and employing different methods for understanding and responding to the research questions.

Testing Case Study: The eighth case study conducted in this research. The purpose of conducting Testing Case Study is to test the quality of the Developed OCAWSEM.

Web Prioritising Principle: The principles which can be used to prioritise the OCAs extracted from Web evaluations.

Web Site Evaluation Forms: The forms which should be used during the evaluation of Web sites. Five forms have been developed in this research, which are named Web Site Evaluation Form 1, 2, 3A, 3B, and 4.