Challenges and Opportunities in Migrating to Web-based Information Services

Perspective of Web-based Enterprise

Bachelor’s Thesis in Informatics

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Abstract

For now, vastly growing Web-technology has matured enough to become an attractive platform for business applications and organizational information systems. Indeed, large and small organizations are increasing their investment in Web-based Information Systems (IS) resources, such as Electronic Commerce, Intranets and Extranets. As DIWA (1999) explained that Web technology is often presented as a 'revolution' in information system technologies in the business press, which could propel change from static, hierarchical structures to more dynamic, flexible and 'knowledge-based' organizational forms. To the companies, more and more legacy information and database systems are being migrated to Web-based environments.

This research aims to analyse and advise enterprises to be Web-based enterprise with challenges and opportunities.

During the research, the author investigated a company that were using the Web-based (applications made available via the World Wide Web) information service. For obtaining reliable conclusions and delivering valuable advises, various research methods were adopted by the author including qualitative research methodology, analysis, interviews, and literature study. Data was collected through lecture review and in-depth interviews.

Undoubtedly, there are some troubles existed in migrating, such as technologies for restructure information system structure, resource distribution, benefit analysis, planning and management, operation and maintenance etc.

But still obviously, as the research shows that there are many benefits can be got follows the implementation of Web-based solution, which includes improving efficiency, modernizing company IT environment, providing better IS/IT systems’ maintenance and providing more agility and functionality etc.
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1 Introduction

In this chapter, by knowing the importance of Web-based information service, the strategic importance of this study is described. Following the development of the research problems, the purpose of this thesis is described as well as how the author delimits it due to certain factors.

1.1 Background

Follow the rising of the network society, Internet is becoming much more important than before. The influence of the Internet has already changed human life, like the way which we thinking, communicating and learning etc.

The Internet’s growth in the past few years has been rapid. For example, the World Wide Web grew from 130 sites in 1993 to almost 71 million as of August, 2005 (Zakon, 2005). Today, the United States has nearly 1.5 billion Internet users owned by more than 200 million people; there are at least 215 million European Union users and China has more than 87 million (Miniwatts, 2005).

The centre for the Digital Future at the University of Southern California has systematically studied the Internet’s growth. They reported the following in 2004 over a four year period: (a) now 75% of Americans have access to the Internet, (b) the Internet has become such users’ number one source of information, and (c) the number of hours people in the U.S. spent online more than doubled to an average of 12.5 hours weekly (Lebo, 2004).

And with the growth and expansion of the Internet, more and more firms focus on the development of the Web-based information system (IS). As the Internet matures, the Web is increasingly used to provide remote and broad access to fully featured applications via a web-browser (David, 2000).

Additionally other new areas of organisational IS management have been developing new applications as “the web offers a platform with unrivalled potential for data access and connectivity” (Dai & McIntosh, 2001). These new areas include the growth of Knowledge Management, the development of collaboration methodologies, the awareness of performance metrics, usability and human factors and the need for new methods for requirements engineering.

Actually, the web-based information services are being widely used within organizations. Most companies’ daily operations are depending on the web-based IS, and it is becoming a trend. Now, more and more applications are based on the web-based platform, including mail systems, file systems, ERP/SAP systems, Business System and other network devices such as firewall, routers etc. Even the IT administrators manage and maintain IS through the Web browsers within the firms.
In the future, companies such as HP indicate that the move to Web applications will be even more dramatic as they claim “the future network environment is the web” and “Everything has a web presence” (HP). As a result, new applications and methodologies are being suggested or incorporated into IS, with the bulk being typically web based (Steve, 2002). Furthermore, according to the relative materials, to build the suitable Web-based application platform, for the first time organizations can (Curl, Inc.):

- Migrate legacy applications into the Web without re-architecting: which means upgrade old applications which based on old IT systems into new IT systems without replacing old IT system architecture.

- Easily deploy complex applications across geographical and technological boundaries: which means the users of the organizations could easily use any applications wherever you are or whoever you are.

- Extend access to critical applications to employees, partners and customers without sacrificing security: which means it will be easy for the organizations to set up access right to special target users.

But, the firms require new concepts for and approaches to Web-based IS development, implementation and management. Virtually, the companies are often confused with making decisions by reason of little information and experiences, when they confront these new IT projects and technologies (Elizabeth, 2003).

### 1.2 Research Problems

Considering the firms are beginning to move from the existing legacy information systems toward Web-based information systems. The small and large firms began to investigate migration feasibility.

Change, especially in technology or in a paradigm, is extremely costly. It requires a large investment in planning, training, designing, development, new maintenance and administration and carries high software and hardware costs. The author realized at the time when doing the migration required integration but also a methodology and technology transfer (Ron, 2000).

According to this background, the investigation of this thesis is trying to discuss and seek answers for the following questions:

- *Why need the firms to migrate the existing legacy applications to web-based applications?*
• Which kind of Critical Success Factors are most frequently existed in migrating and why?

• What troubles will the organizations meet in migrating?

• What kind of benefits could the firms obtain in migrating?

1.3 Research Objective
Organizations today are desperate to identify new opportunities in the facilities provided by the Internet. Few have attempted to link interorganizational, interfunctional and interpersonal levels of their organizational processes via Web services. As Guah (2005) claimed that “They have undertaken this process in anticipation of reshaping and improving their core business processes”.

This research details how Web-based could potentially make a significant difference in the integration of software applications across multiple platforms, sites and departments of an organization. As Web-based solution could sooner or later become a permanent business necessity and not just a competitive advantage material, this thesis on “challenges and opportunities in migrating to web-based services” could be interesting for the companies who want to plan and implement the Web-based enterprise. Additionally, it could be also interesting to those companies who have already been Web-based enterprise but still have some issues within the company. Finally, I hope this thesis could support valuable and useful information for the further research in this area.

1.4 Purpose
The purpose of this thesis is to external research and analyzes benefits and risks for the enterprise to be Web-based enterprise.

In summing up, this paper presents a current landscape of the discussions for the companies who are gone to be web-based enterprises or who have already been. To show incredible benefits with adopting this solution for people or organizations who are interested on this area.

1.5 Delimitations
It is important to stress here that the author of this paper delimits all of the variables in it: 1. Web-based Enterprise, 2. Information Technology, 3. Risks and Challenges, and 4. Benefits and Opportunities. By focusing on specific keywords, this research can be done in a more efficient way and the reader can understand this report’s problem statement clearly.
In my opinion, Web-based application is becoming the core of the world. More and more companies are completely based on the Internet, and involves minimum of physical element (a person sitting behind a computer connected to the Internet). It interconnects people and organizations from all over the world, and allows them to communicate, interact, easily share information between the different departments of the organizations, etc. It is a great information technology. None the less, it provides opportunity for organizations to obtain considerable benefit with limited resources.

As Mike (2008) explained that Critical Success Factors have been used significantly to present or identify a few key factors that organizations should focus on to be successful. And please note that the critical success factors (that are those things which must go right for the organization to achieve its mission) and benefits discussed in this thesis for the company to be Web-based enterprise are not necessarily the only reasons and conditions of providing references with organizations.

In many cases, each company has its own special IS environment. So, this research report just describes the challenges and opportunities for the company to be Web-based enterprise in widely common sense. As mentioned former, various IS technologies develop so quickly. With the evolution of information technology, other techniques or other factors may become available or even preferable.

1.6 Glossary

Considering not all readers are familiar with the technology or terminology referred to in this research report. This section includes definitions of major terms and an explanation of acronyms.

Information System (IS): Information Systems exist in various forms but has the overall goal of supporting the business with valuable information through some type of interface connected to a database. Information system is a narrower term than IT, focusing on business systems that process, stores data, which transmit and retrieve data from other systems or applications.

Project Management (PM): The coordinated management of a portfolio of projects to achieve a set of business objectives is called program management. Or, a program might refer to an ongoing set of activities internal to the organization.

Web 2.0: Web 2.0 refers to dynamic websites which incorporate user interaction, unlike the websites in the past which were static, basic, and used only for informational purposes. Very popular versions of these dynamic websites are the on-line social networks, namely HI5, MySpace, Facebook, and many others.
Web-based: Information and application are available to use via the World Wide Web.

Critical Success Factors: Those are those things which must go right for the organization to achieve its mission.

Web Services (WS): WS are services (usually including some combination of programming and data, but possibly including human resources as well) that are made available from a business's Web server for Web users or other Web-connected programs.

IS/IT: Information System and Information Technology, IS have already been explained before, and IT refers to both the hardware and software that are used to store, retrieve, and manipulate information, also primary means computer technology.

VPN (Virtual Private Network): A virtual private network (VPN) is a network that uses a public telecommunication infrastructure, such as the Internet, to provide remote offices or individual users with secure access to their organization's network.

PDA (Personal Digital Assistant): A handheld computer for managing contacts, appointments and tasks. It typically includes a name and address database, calendar, to-do list and note taker, which are the functions in a personal information manager. Wireless PDAs may also offer e-mail, Web browsing and cellular phone service. PDA with wireless function can synchronize data between the PDA and computer via wireless.

GPRS (General Packet Radio Services): GPRS is a packet-based wireless communication service, which provides data rates from 56 up to 114 Kbps and continuous connection to the Internet for mobile phone and computer users.

1.7 Disposition of the Study

Chapter 1 In this chapter, by knowing the importance of web-based service, the strategic importance of this study is described. Following the development of the research problems, the purpose of this thesis is described as well as how I delimit it due to certain factors.

Chapter 2 In this chapter, the work plan is presented as well as research approach followed by description of the methods to be used. Furthermore, which empirical data is collected, and the trustworthiness measurement of data is provided.
Chapter 3  In this chapter, a lot of theoretical knowledge about web-based service is summarized and analyzed by referring a collection of literatures. This is also the foundation chapter of the next following empirical findings.

Chapter 4  In this chapter, the author will describe his empirical findings in investigation with detail, including the presentation of the company and its IT environment. In order to reach better validity of the research, the author used instructional study, which basically follows the structure of the theoretical framework.

Chapter 5  In this chapter, the author will analyze the perspective of Web-based enterprise on the basis of the structure of the empirical findings. As a result of the analysis, the author will present suggestions and solution upon the issues identified. Furthermore, several managerial implications will be discussed.

Chapter 6  In this chapter, according to which have been discussed in the previous chapters, the author will look back relative knowledge before highlighting the problems and will give much more suggestions for further research.

Chapter 7  In this chapter, the author describes the limitations in the process of writing this thesis, and proposal for further studies in Web-based application is explored.
2 Methodology

In this chapter, the work plan is presented as well as research approach followed by description of the methods to be used. Furthermore, which empirical data is collected, and the trustworthiness measurement of data is provided.

2.1 Methods

This section is written as an introductory part to provide the reader with a guide to the research process and with the necessary theories and skills to undertake a piece of research from thinking of a research topic to writing this bachelor thesis report. Therefore, the author of this paper discussed the various knowledge about methods, which includes interviews and data collection as well as both quantitative (statistical) and qualitative (no statistical) analysis techniques and, as you have properly found from the title, is the focus of this chapter.

2.1.1 Induction and Deduction

Obviously, this research project involves the use of theory. That theory may or may not be made explicit in the design of the research, although it will usually be made explicit in the presentation of the findings and conclusions. The extent to which you are clear about the theory at the beginning of your research raises an important question concerning the design of your research project. This is whether your research should use the deductive approach, in which you develop a theory and hypothesis (or hypotheses) and design a research strategy to test the hypothesis, or the inductive approach, in which you would collect data and develop theory as a result of your data analysis (Mark, Philip & Adrian, 2007).

A commonly held idea of the distinction between these logical paths to knowledge is that induction is the formation of a generalization derived from examination of a set of particulars, while deduction is the identification of an unknown particular, drawn from its resemblance to a set of known facts (http://www.ssr.org/Induction.shtml). For example, if we examine enough feral cats we can generalize that feral cats are a rich source of fleas (induction). If, like Robinson Crusoe, we come across footprints on the beach of a desert island, we can conclude from our knowledge of the human footprint that another human is or was on the island (deduction).

In fact, however, both of them have their own special meanings. The difference between these two terms can be showed as the following flowchart (See Figure 1 Research Approaches).
In this study, the inductive way is chosen as the research approach of this thesis. Although this research area has been explored by many former investigators, various viewpoints have been described; it is still no last word about the process of the migration from legacy systems to Web-based platform. Too many uncertain issues will be faced during this process, for example, which kind of challenges will appear, which kind of requirements will need and which kind of benefits will obtain, etc.

Furthermore, theoretical framework about Web-based migration will be discussed and expounded according to the reference books and materials. A lot of empirical data which are collected by literature review and interview will be Stat. and analyzed. Finally, the conclusion is obtained based upon the combination of secondary data and empirical findings.

Within the field of research methodology there are two general views on data collection. These are quantitative and qualitative methods (Gill & Johnson, 1997)

2.1.2 Quantitative
According to Mark et al. (2007), quantitative data in a raw form, that is, before these da-
ta have been processed and analysed, convey very little meaning to most people. These data therefore need to be processed to make them useful, that is, to turn them into information. Quantitative analysis techniques such as graphs, charts and statistics allow us to do this; helping us to explore, present, describe and examine relationships and trends within our data.

### 2.1.3 Qualitative

According to Mark et al. (2007), qualitative data refers to all non-numeric data or data that have not been quantified and can be a product of all research strategies. It can range from a short list of responses to open-ended questions in an online questionnaire to more complex data such as transcripts of in-depth interviews or entire policy documents. To be useful these data need to be analysed and the meanings understood.

Dey 1993(Sources: Developed from Dey (1993); authors’ experience), gives distinctions between quantitative and qualitative data as follows:

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<td>· Based on meanings derived from numbers</td>
<td>· Based on meanings expressed through words</td>
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<tr>
<td>· Collection results in numerical and standardized data</td>
<td>· Collection results in non-standardised data requiring classification into categories</td>
</tr>
<tr>
<td>· Analysis conducted through the use of diagrams and statistics</td>
<td>· Analysis conducted through the use of conceptualization</td>
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Both of quantitative and qualitative data collection techniques and analysis procedures have their own strengths and weakness. The data collection techniques which you choose decide which kind of results you obtain. Because of this, some questions that may occur to your research project, like ‘How do I know which data collection techniques and analysis procedures to use in which situation’ there is always no simple answer. However, above all, it is vital for the researcher to know these basic concepts, the next following examples is helpful to make these a little bit clearly.

Examples of methods associated with quantitative data research:

- questionnaire or survey technique
- structured observation (predetermined schedule)
- content analysis (predetermined categories)

Examples of methods associated with qualitative data research:
· interview/oral history
· observation (participant/non participant)
· documentary analysis

In this research report, secondary data provided by the literature review and together with primary data, which is collected through qualitative research methods such as in-depth interviews are applied by the interviewers. In order to deeply understand the objective of this thesis, the major research approach is subjective and aims at explore and describe the perspective of Web-based enterprise. As the qualitative research is chosen, the major data collection of this report is not done in the form of numbers but in descriptive words.

The study in the following chapters is mainly process-oriented rather than outcome-oriented, which starts from the construction of interview guide. And then, the data collection section presents the methods, which are chosen and adopted in this thesis.

2.2 Interview Guide

Obviously, there are a lot of ways to collect data for the research; one of the most common ways is through interview. By comparison, semi-structured and in-depth (unstructured) interviews are non-standardised. These are often referred to as qualitative research interviews (King, 2004).

Then, what is an In-depth Interview?

According to Lisa A. Guion, in-depth, qualitative interviews are excellent tools to use in planning and evaluating Extension programs. An in-depth interview is an open-ended, discovery-oriented method that is well suited for describing both program processes and outcomes from the perspective of the target audience or key stakeholder.

In an exploratory study, in-depth interviews can be very helpful to ‘find out what is happening [and] to seek new insights’ (Robson, 2002). The primary purpose of the interview is to deeply research into the interviewer’s point of view, advice and perspectives. Usually valuable information can be yielded through in-depth interviews in this sense.

In this case study, the author tries to investigate depth in the areas that identified as the most important in the perspective of web-based enterprise.

Looking at the interview guide (Appendix B), one can see different questions listed on the paper. These questions start from a brief introduction of the company and its IS/IT
environment, including which kind of ISs they do use. To get more enough background information on IT system architecture could be helpful for the researcher to have a probable understanding.

Then all of the following questions focus on the core with the perspective of Web-based enterprise, which including benefits, risks, challenges, performance and perspective. The author believes that all the valuable data collected by this interview guide could be used in the chapters of “Empirical Findings” and “Analysis”.

2.3 Data Collection

2.3.1 Trustworthiness
As a rule, the research conclusion which is drawn from data collection and research methods will be no valuable without guaranteeing the credibility of data and methods being used. Therefore, the author was always trying to find the certain rules and following them during the entire research process.

As soon as we talk about qualitative research methodology, reliability and validity always come out in our mind. In other words, they are the necessary factors, which can create about trustworthiness, rigor and quality. It is also the way that the author achieves validity and reliability of a research without bias. This even can increase the researcher’s truthfulness for describing a research problem.

Therefore, whatever research we want to do, reliability and validity are necessary and important to be relevant research concepts, especially stand on a perspective of qualitative research methodology. For reflecting the multiple ways of establishing truth, the author needs to define and explain these relative concepts.

2.3.2 Validity
In conformity to Babbie (1990), validity refers to the extent to which an empirical measure adequately reflects real meaning of the concept under consideration. In this whole research report, all the concepts and theories which are used here are referred to relative literatures and certain authoritative documents in this correlative area, which aims to ensure the validity of this research.

Before writing this report, the author has already worked as IT System Engineer much more than 4 years. Therefore, the author is very familiar with which types of measurements/methods would be most relevant with the perspective of Web-based enterprise and will be effective for this actual study. The data, which is collected from interviews,
may be empirical and applied because of being deep understanding on the relative con-
cepts and abundant working experience.

Additionally, the research objective was already decided and investigated in some broad
ways during experience before seeking for more methods to support and applying fur-
ther investigation.

In this way, the author keeps this study always on the right track towards the termini.
Furthermore, since this study belongs to causal study, the validity can also be come true
through testing the results of adopting Web-based solution.

2.3.3 Reliability
The reliability of a measure indicates the extent to which it is without bias (error free)
and hence ensures consistent measurement across time and across the various items in
the instrument. In other words, the reliability of a measure is an indication of the stabili-
ity and consistency with which the instrument measures the concept and helps to assess
the “goodness” of a measure.

The author will try to provide a high reliability on this thesis, and as the author will use
in-depth interview, questions which are prepared in advance can be asked during the in-
terview. This can improve the thesis’ reliability, because these questions in a manner
have already been formulated by the author.

2.3.4 Case Study
Roboson (2002:178) defines case study as ‘a strategy for doing research which involves
an empirical investigation of a particular contemporary phenomenon within its real life
context using multiple sources of evidence’. And moreover, if you want to gain a rich
understanding of the context of the research and the processes being enacted, the case
study strategy will be of particular interest to you (Mark et al., 2007).

According to Mark et al. (2007), the case study is most often used in explanatory and
exploratory research. There are maybe various data collection techniques and are likely
used in combinations, perhaps including, for example, interviews, observation, docu-
mentary analysis and questionnaires.

Here, I chose a single case study as the research strategy in this research report. As
Mark et al. (2007), explained that “A single case is often used where it represents a
critical case or, alternatively, an extreme or unique case”. Here, the primary reason for
me to choose this research strategy is because I am sure that this chosen case could pro-
vide me enough opportunity to investigate, demonstrate, analyse and answer my re-
search questions of the thesis—challenges and opportunities for the company to be a
Web-based enterprise. Just like Mark et al. (2007) claimed that “The case study strategy also has considerable ability to generate answers to the question ‘why?’ as well as the ‘what?’ and ‘how?’ questions, although ‘what?’ and ‘how?’ questions tend to be more the concern of the survey strategy”. Actually, whatever explanatory research or exploratory research often uses case study strategy mostly.

2.4 Work Plan

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<td>Prepare &amp; Book Interviews</td>
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<td>Data Analysis</td>
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<td>Reach Conclusion based on Literature Review</td>
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<td>Discussion &amp; Conclusion based on Empirical Findings</td>
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![Gantt Chart - 3 Month Time-Working Line](source: Own prepared (2008))

Before starting to write this bachelor thesis, I have a lot of questions to myself, for instance what is a research, what is the scientific way to lead to an objective research, how the research should be planned and carried out, which method are most suitable for my research. Furthermore, I do not have similar experience on writing thesis report. Consequently, the author thinks that it is very important of learning the methods before applying them in this research.

The work plan (See Figure 2 Work Plan) can be reviewed for detailed actions. And a suitable time-working plan can show a planning of the project and thesis activities; from moment now till the final thesis presentation and marking. When is the author going to do what? What are important presentation dates? And what should be ready then? How long do certain phases of the project last, or how long would the author like to spend time on certain phases? It gives the author the possibility to set priorities (Remon, 2008).

In order to implement a feasible research, the author needs to choose and optimize research methods. And research or methodology refers to the procedural framework within which the research is conducted. According to the theories of business research methods, the purpose, depth and delimitation of the research decide which suitable
methods should be chosen. In my opinion, this report can accurately explain the re-
search problems and precede with further research studies.
3 Theoretical Framework

According to Uma (2003), a theoretical framework is a conceptual model of how one theorizes or makes logical sense of the relationships among the several factors that have been identified as important to the problem.

3.1 Discussion of Web-based Enterprise

The Web burst on the scene in the late 1990s. It was first proposed as a research project at CERN in March of 1989 (Berners-Lee, 1990), but for most people it entered their consciousness with the access provided through consumer-oriented Internet systems such as America Online, Prodigy, and CompuServe (starting in 1996). The financial world jumped on the “dot-com” bandwagon with a vengeance thereafter, and Jeffrey Bezos, founder of amazon.com, found himself on the cover of Time as man of the Year in 1999.

Everything is changed by the touch of Web, from the people who surf its varied Web-Pages to the people who post those Web pages. The Web-based enterprise is an enterprise that has been touched by the Web (Guah, 2005). The feeling is much like that of a wader in the sea who is knocked down by an unexpected wave: sputtering, the drenched soul stands up, brushing off sand and saying, “What was that?” “That” is the Web for the drenched and disoriented organization (Jesse, 2000).

The organizations find that they are Web-based enterprises when they use the Web quickly: the Web is becoming the core of what it does and how it does it (Carl, Jia & kim, 2004). The web users quickly spread all over an organization and effects activities run around the Web itself.

According to Jesse (2000), a Web-based enterprise is an integrated operation in which the Web and traditional media are part of a unified and consistent organization. Based on this point, the Web becomes central to an organization that commences to use it. As a Web user, perhaps you have already experienced this for yourself: after you use e-mail for a relatively brief period of time, you are properly accustomed to use it, even your phone calls and paper-based communications have been properly reduced. The power and efficiency of the Internet quickly overwhelm less powerful and efficient technologies (Jesse, 2000).
In addition to the one obvious characteristic—the use of the Web—Web-based enterprises share several attributes among them: they function in an environment with certain characteristics, and they continually move back and forth between the virtual and bricks-and-mortar worlds (Stanislav, 2003).

Beyond the use of the Web, Web-based enterprises share these four attributes (Jesse, 2000):

· They are Web-size organizations: which means the staff can access and use company’s resources at any places via the Internet.

· They function in Web time: which means the staff can access and use company’s resources at any time (7*24).

· They are located in Web space: which means there is no limit on spaces for the companies.

· They are flexible: which means the resources could be easily and timely accessed by the staff without the limitations of time or place.

### 3.2 Critical Success Factors in Migrating

As a definition, critical success factors refer to "the limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department, or organization" (Mike, 2008).

Then, how to successful migrate to the platform with web-based information services? In my opinion, it’s really perhaps a matter of understanding the need first, then the requirements, and finally tries to find out how to solve the problem for this migration process. Make no mistake: This is a difficult and complex process, but one you can handle when armed with the right and enough information (Turban, Leidner, McLean & Wetherbe, 2008).

Usually, the enterprises remain short of discovering the full potential and benefits of Web-based services without a complete solution (Ferrari, 2005). In my opinion, the pursuit of Web-based migration is like chasing the tail of a growing beast.

For now, that “beast” has remained ahead of us, and a great deal of work remains ahead of us. But rest assured, a solution will be found and the once-unimaginable benefits of web-based application will become an everyday reality (Guah, 2005).

Based on the above-mentioned conditions, the next following sections talk about critical success factors in migrating.
3.2.1 Planning and Management

Usually a project is always exciting at the beginning, perhaps the partial reason is the mystery of what lies ahead. Planning a project of Web-based migration requires you to fulfill technology theory, management theory, and your own creativity to create a product, which meets the requirements of your intended audience (David, 2000). Through mixing of project goals, team members, ideas, and choice of implementation, the final product will be produced. And yet, every project—whatever scale, duration, innovation, or complexity—follows essentially the same process that starts with planning (Elizabeta, 2003).

Planning entails considering possibilities, gathering information, assessing needs and resources, balancing priorities, articulating goals, and outlining an overall process. Unfortunately, in many cases, planning is considered frivolous, an impediment to getting the actual work done. In fact, many problems await the project team that overlooks this step and jumps into development too early (Elizabeta, 2003).

To reach the project in a short amount of time, a larger budget is needed probably, which aims to supply more equipment and perhaps contract with additional manpower (Elizabeta, 2003). Although it can be difficult to work within all three constraints, it is important to be conscious of the relevance of each of these elements throughout the planning, development, and evaluation stages (Lebo, 2004).

The emphasis of PM is increasingly focused on the satisfaction of the enterprise or people involved, rather than concentrating simply on timetable and expenses. The fourth element, now recognized as core to project management, emphasizes participation, communication, and team dynamics with the project team, and between the team, stakeholders, and target audience (Mark et al., 2007).

Additionally, the project manager is perhaps most importantly, who must ensure the project chosen is worth the enterprise’s investment. There is no so-called perfect plan without any constraints, just be realistic about this as the project manager (McLean, 2008). Although you may envision the idea project, an assessment of the skills and resources available might suggest you undertake a less extensive project (Robins, 2002). To make sure your final proposal will remain feasible, always be in the sight of the project as a whole and remember why you do want to undertake it.

According to Elizabeta (2003), initial planning and ongoing management and review are important, and common reasons a Web-based instructional project might fail include:

- Lack of administrative support or interest outside of the project team.
- Dysfunctional communication between project team members.
- Misconceptions about institutional and audience needs.
· Poor choice of instructional approach and educational technology.

· Omission of ongoing reviews and prototyping on a smaller scale.

· Refusal to revisit issues after initial planning.

To make sure that the project proposal is well defined in schedule, scope, objective, feasibility and reliability, when you start to do the project. Appendix A described the basic steps which are prioritized for common Web-based enterprise projects. Once the appropriate decision-maker adopts the proposal, an action plan can be executed by the project manager with more specific timelines and assignments.

Furthermore, there is one important thing should also be considered—the effectiveness of the project team itself. In some cases, because of the changes in enterprise requirements, introduction of new technologies, or unknown reasons, the project will be terminated by the project team during the project development (Elizabetha, 2003). To avoid this kind of situation, it is also useful to develop criteria, which characterize successful project management for your organization, consider elements such as leadership, organization, communication, decision-making, delegation, creativity, commitment, conflict resolution, flexibility, and assessment (Steve, 2002).

Usually, experience is the best guide, but often the project is new to the project team. Under this condition, communication with team members or audiences is very important, you must next rely on listening to others, put yourself in mind of the possibilities, and if possible, contingency plans could be considered.

Undoubtedly, planning is important, but still need remember never to be controlled by it. There is no way to create a so-called perfect timeline, the various problems and obstacles are always exist ahead, and accept this fact without suspicion (McIntosh, 2001). An overall strategy for the project development is very useful, but keeps flexible within the process of the project.

In other words, the project will be frustrated or even be washed-up, if you are too rigid. Instead, regard decisions and variations to your initial plan as part of the process without changing.

To ensure the project progress on the rails, each aspect of the project must be found ways to monitor and enable the work, including regular meetings, built-in checkpoints and deliverables (Edward, 2003). The progress, problems and ideas are encouraged to discuss within the regular meetings, which are extremely useful to keep the project doing well. Moreover, there are other positive strategies exist for maintaining constant progress and resolving issues early, which includes reports, prototypes or completion of some parts.
Whoever wants to create Web-based instruction will find out that planning and management occur throughout the whole process. Fortunately, many problems can be avoided or resolved if adequate time is devoted in the planning stage to the scope and timeline, team and partners, audiences and stakeholders, pedagogical approach, and educational technology (Elizabetha, 2003).

3.2.2 Evaluation and Assessment

On the base of the actual practice of implementing a project with Web-based solution, sometimes you need discuss evaluation before development, although it is maybe a little weird. In fact, design is a reduplicative process of developing and testing the idea, then making improvements. In the case of the designing Web-based platform, once you have any ideas of the project you are going to do, it is likely that your first step of research and evaluation will start, and other following steps will continue as an integrated part of your design and ongoing review processes. To put this into practice, adequate time must be allocated throughout the timeline to allow for not only test your findings.

Evaluation and assessment methods can help you to determine the success of project, as well as the efficacy of the site you design and the effectiveness of your instructional design for organization operation (Irani, 2000). To draw these conclusions, you will likely deal with measurement theory, web technology, data collection, user requirements and performance analysis (Kornel, 1999).

You find that cheap, ubiquitous access to the Internet has created the possibility of entirely new business models, which must at least be evaluated since the competition is already doing it (Mahesh, 2008). Basically, there are a lot of reasons why do need this part of evaluation and assessment (King, 2004).

Firstly, you might need research your target audience and stakeholders, then much more valuable information about your actual needs and expectations of the organization could be obtained.

Secondly, to avoid to waste resources and testify whether you are on the right track before development, you can test prototypes of your Web-based project. To see what is going on exactly.

Thirdly, it is important for the company to review and analysis of the project with the project team and external participants. Some unexpected errors could be disclosed by you and your team.

Moreover, perhaps above all, this step can allow you and your project team to improve your project, address users’ needs, and prevent unexpected issues before carrying out the project development (Kornel, 1999).
According to Elizabetha (2003), lest it sound as if evaluation and assessment should become your primary focus, remember to keep this aspect in balance with the other goals and priorities of the project, determine what data and feedback will be useful to the future, to make the most of your limited time, it is important you design research methods and devise statistical analyses that will specially address those issues, rather than simply collecting all data possible.

In the other way, it may be helpful for you to collaborate with the other instructors with enough abundant experiences, perhaps they might be able to share or contribute the old relative Web-based project with you. Through collecting these useful data you can compare before and after the Web-based project you can know the influence of your project on your enterprise.

Another important group need to contact is the staffs who manage the servers on which your site will be hosted (Kornel, 1999). As Lebo (2004) explains that Early discussions with system administrators will set the foundation for better long-term communication about what information you pending on the size of that staff and the frequency of your collection of data, you might request that the system allow the project manager to check on the statistics at regular intervals, perhaps even cleaning out older data at the end of the training session, semester, or calendar year.

Evaluation and assessment can provide important insights into the effectiveness of the instructional approach, technological choice, site design, and content (Elizabetha, 2003).

### 3.2.3 Design and Development

Creating a quality Web-based instruction project is not the same as simply just publishing information online or creating an informational Web site. Instead, you need pay more attention to the entire IS/IT systems architecture; you need to know what exactly the company does require for now; you need build a perfect project plan with good quality.

According to Elizabetha (2003), the following initial steps need to be considered, such as:

· Articulate goals and objectives.

· Select the instructional approach.

· Create a site flowchart and determine global navigation.

· Test (perhaps with paper prototyping and focus groups).

· Review and revise with project team and partners.
Also according to Elizabetha (2003), once the foundation of the instruction is determined, you can focus on creating a prototype or pilot of your full project. Possible steps might include:

· Outline and roughly draft content.
· Develop relevant interactions.
· Review and revise with project team and partners.
· Test (perhaps with focus groups and/or usability testing).

3.3 Benefit Analysis

3.3.1 Agile, Adaptive and Real-time

Such as a famous scientist of nature, Charles Darwin said, “It’s not the strongest of species that survives, or the most intelligent; but the one most responsive to change.” As we all know, the organizations operate in a rapidly changing environment where the adaptation needs to be done quickly, so what is true in nature is true today in organizations (Turban et al., 2008).

To be a Web-based enterprise, organization is able to identify and quickly respond to challenges and opportunities, and to adapt to changing business models, processes, and market demands, helping them to outperform and assert change on the competition quickly. And this could also allow the organization to reduce the cost of IS management, and enables more choices that can lower cost of ownership. Furthermore, an adaptive Web-based solution could enable organizations to establish and meet increasingly aggressive service requirements, assuring appropriate levels of availability, response time, and performance (Turban et al., 2008).

Today, business needs to be able to respond quickly and properly to changes as well as to be leaders of innovation for the sake of adopting the rapid and large fluctuations in the business environment (Turban et al., 2008).

Also, responses in real time are often required. IT is the facilitator of agility and flexibility. In other words, it must be accomplished rapidly and efficiently whatever changing information systems or building new ones. Thus, we are looking at the digital and agile enterprise that must be supported by IS (Mclean, 2008).
3.3.2 Messaging and Collaboration

According to Turban et al. (2008), there are several factors, which are driving the need for messaging and collaboration. People always need to work together, and this will be easy to share documents. Most of the complex decisions in organizations are made within the group meeting. And organizational decision making is difficult when team members are geographically spread out and working at different times.

The Telecommunications Industry Association (TIA) (tiaonline.org) indicates that global revenues from collaboration will show a 66.5 percent compound annual growth rate, reaching $11.4 billion in 2007 (TIA, 2004). This is really an amazing growth, and the main reason for this result is that nearly 87 percent of employees around the world work in remote office. Organizations, who want to solve this problem, just need to create a good Web-based collaboration platform. Like Web 2.0, McAfee (2006) described Web 2.0 “as the point in the history of the Internet where technologists finally got out of the way and built tools to let users collaborate without a lot of up-front structure.”

Through using Web-based information service, the organizations can obtain a lot of benefit. For instance, this includes sharing and exchanging information easily between retailers and their suppliers; reducing product development time; getting lower transportation and inventory costs and reducing stockouts etc.

3.3.3 Operation and Maintenance

As Web-based technology is very rapidly developed and applied within many business areas, systems and network management are becoming much more important than before.

Obviously, there are a large number of benefits in terms of unification and simplification of IS management have been offered by this new technology, which is found on the internet. The ability to use a universal browser to access management functions, device status, performance metrics, statistics, and to configure remote managed objects from anywhere at any time is a realistic and significant dream of many managers (Kornel, 1999). In other words, it is very useful for IS managers, system administrators, operators, performance analysts and designers.

According to Kornel (1999), the Web-based enterprise management can provide lower costs, increase flexibility, and reduce the complexity involved in managing their networks and systems. There are three key advantages base on this technology:

- Scalability. A broad range of network resources could be cost-effectively supervised by taking advantage of Web-based technology for the enterprises, routers, switches, PCs, workstations, distributed applications, and databases, just only need Web browser.
When organizations use the same technologies for building networks and managing networks, the scalability of the applications can match that of the network (Kornel, 1999). A system administrator of IS/IT department can monitor and maintain multivariate information systems only by using the Web browser, which include various servers and everything between each other by providing such scalability. Moreover, it will support a wider range of management solutions and will build on internet innovations to meet the demanding requirements of the most complex various computing environments (Kornel, 1999).

- Increased choice in applications, greater functionality. It will be much easier to build management applications with more efficient and cost effective by using this new technology. A primary benefit for users will be significant: a greater selection of management applications and added functionality that takes advantage of rapidly evolving Web technology.

- Lowered costs for set up and operation. The complexity which currently frustrates system administrators could be greatly reduced by using a single interface for managing all networks, systems, and applications. The Web-based management will allow the system administrators to access management applications at any Web-enabled client systems which are distributed throughout an organization: instead, they only have to access freely from specially outfitted consoles before.

So, Web-based enterprise management is targeted at enterprise network support staff to monitor the network, understand potential malfunctions and alarms, and provides their users with continuous network availability.

3.4 Issues Analysis

When we talk about the benefits of Web services, we cannot overlook a few issues in using Web services as well (Sleeper & Robins, 2002).

3.4.1 Multi-tenancy Facilities Collaboration

Today, as the level of software complexity continues to increase over the last four decades, the traditional software architectures seem to be not enough ability to deal with the increasing levels of software complexity, which have purposed to deal with this. At the same time, traditional needs of IT organizations persist; the need to respond quickly to new requirements of the business, the need to continually reduce the cost of IT to the business, and the ability to absorb and integrate new business partners and new customer sets, to name a few (Kishore, 2003).

As we all known, normally, the organization have already gone through multiple IS architectures, which are designed to allow completely distributed processing, and applica-
tion softwares could be used on any platform, implementation schedules could be greatly reduced, even a mass of connectivity products are designed to integrate different applications fast and better.

However, the complete solution still hasn’t emerged, even it continues to elude us. During the following sections, the author will describe this problem in two points.

Firstly, the problem of complexity will be described. Some things are always the same, here especially means when IT organizations face the business problems. Company management always asks IT engineers to push for better IT utilization, which includes integrating historically individual systems and running new systems fast; but certain things are becoming different now. In other words, more complex environments will be found today. Legacy systems must be reused rather than replaced, because with even more constrained budgets, replacement is cost-prohibitive (Kerrie, Kishore, Edward & Tuggle, 2003).

Obviously, increasing fares on merger and acquisition has become standard fare, so entire IT application systems must be integrated and absorbed during the process of migration. In this increasing complexity environment, point solutions will have no chance to lead us out of the woods, even bring on exacerbating the problem. Systems must be developed where heterogeneity is fundamental to the environment, because they must accommodate an endless variety of hardware, operating systems, middleware, languages, and data stores (Kerrie et al., 2003).

According to Kerrie et al. (2003), with all these business challenges for IT, it is no wonder that application integration tops the priority list of many CIOs, as shown in Figure 3.

![Figure 3 CIO priorities](image)

Source: Kerrie et al. (2003)
Finally, the most troublesome problem is multiplicity of interfaces. Virtually, all organizations look out on integration problems of some sort; which could be result in various reasons, for instance a company merger, a new business federation, or merely demand to connect with existing systems each other. If n application systems must be directly interconnected, it will produce n (n-1) connections, or interfaces. In Figure 4, each arrowhead represents an interface.

![Figure 4 Direct integration of n applications](image)

Figure 4 Direct integration of n applications
Source: Kerrie et al. (2003)

Consequently, if another application system A n+1 must be integrated, it will require that 2n new interfaces be generated, documented, tested, and maintained. While in the diagram above, the set of five applications require 20 direct interfaces, the addition of a sixth application will require ten new interfaces (Kerrie et al., 2003)! Even worse, the substantial testing codes could be generated, because of modifying each existing applications' code to involve the new interfaces. Immediately, you look for the optimum solution that produces the minimum number of interfaces (n) for n applications, with only one new interface for each additional system added, but find that it can't be done by direct connection (Holley, 2003).

### 3.4.2 The Costs of Doing Business

How to cut business costs is always one of most important management issues when dealing with Web-based information services (or related Internet strategies). As relative research indicates that the organizations always underestimated and even overlook the expenditure of hidden costs when they develop new information technology systems. One of the difficulties regularly faced by IS investment planners is the identification, and thus management of, hidden indirect costs, for example, human indirect costs (Mo-
hamed, Irani & Baldwin, 2002). Usually, this will be difficult for the organizations who try to identify the critical indirect human costs associated with IS adoption as a fundamental part of the cost estimation of strategic planning when adopting IS (Matthew, 2005). According to Mohamed et al. (2002), an indirect human cost could be composed of associating with management, employee, finance, and maintenance divisions of an organization (Guah, 2005).

As we know, direct costs are always deemed to be easy to identify and relatively simple to measure. Then, why are the indirect human costs not considered? On the basis of the correlative research, the primarily reason is because they are hidden and difficult to be identified. Moreover, there is no clear consensus or approach for measuring these costs, which, as cited in the literature, can significantly hinder the progress of an organization in the IS practice (Guah, 2005).

Additionally, when the organization changes to adopt new systems, there are a great deal of time will be required to integrate a new system (Miniwatts, 2005). And even the users have to take a long learning period to go through this, because they have to accept training about this new system. Hence, a loss in productivity maybe occurs before the users are familiar with the new system.

On the other hand, although the employees successfully acquire new skills as a result of training, they may request the company to increase their salaries because of their new, highly marketable skills (Baldwin, 2002). In this case, the company cannot optional reject the request, because this will maybe result in staff turnover.

Furthermore, introduction of a new IS could result in an unpredicted political power shift that leads some individuals or groups to resist, as well as resulting in escalating operational costs. Introducing a new system may also result in managers being less productive, and hence not adding any value to the organization (Guah, 2005). As a result of the introduction of the new system, the organization may assign less demanding tasks to very skilled employees, which is likely to lead to indirect human costs such as job dissatisfaction and staff turnover (Eldabi, 2003). Finally, it is impossible to predict when high staff turnover results in a significant change in the knowledge base of the organization.

Wood (2004) reports that in the United States it is estimated by the IT Training Association that there are 10 million IT workers, and each cost their corporations more than $2,000 per year on training, thus amounting to more than a $20 billion market. Remenyi, Money, Sherwood-Smith & Irani (2000) note that many decision makers believe that the total cost of IS is too high; nevertheless, many IS managers in organizations are not even sure what it is in IS that is costing so much (Bannister, 1999). Currie and Irani
(1999) and Al-Yaseen, Baldwin, and Eldabi (2003) reveal that management dedicate only minimal attention to the less clear, or hidden, indirect costs (Guah, 2005).

3.4.3 Security Leaks

During the past few years, significant Web-based service technology area has been perform widely within numerous organizations. As a consequence of these initial efforts, WS foundational stable specifications have already been delivered (Ferrari, 2005). Computer and IT security issues are becoming more important, at the personal, organizational, and global levels (Turban et al., 2008). Now, it is proper time for the organizations to standardize and deal with the security problems, which have emerged from this application. Although the organizations have already carried out much activity on this subject, the leaks still exist in most of them.

As the author mentioned before, Web-based applications allow the organizations easy to share and exchange information, even communicate each other between different departments. Consequently, Web-based solutions must be concerned with typical security problems that are common to distributed communications, through a compromised channel, between two or more parties (Ferrari, 2005). Some of the major inherited security issues that WS technologies must address are authentication, authorization, confidentiality, data integrity, non-repudiation, and availability (Sedukhin, 2003). WS must address both the issues inherited from the distributed computing classical scheme and those arising from the new threats created by its own nature (Ferrari, 2005).

As Web-based IS has been adopted, the companies have to face threat of hackers, viruses, or anonymous attacks through web browser. Actually, the security issues are becoming more pronounced. There are several security related challenges, which are faced by the Web-based enterprises. A window which can be passed through by the entire Internet will be opened into your local network at that moment, when you adopt the Web-based solution. Most visitors are content to window shop, but a few will try to peek at things that aren’t intended for public consumption. Others, not content with looking without touching, will attempt to force the window open and crawl in (Bhasin, 2002). These illegal and invasive behaviors could result in various breakages—for instance, your website’s home page may be hacked or replaced, and even your entire sensitive company data which is stored in the server database may be stolen. Furthermore, sometimes millions of dollars could be lost just because of a virus’ or hacker’s attack. A single break-in that successfully compromises a key e-commerce server can leave an e business out of business for hours (Bhasin, 2002).

According to Ferrari (2005), some of the new threats associated with WS technologies are enumerated below:
1. Risks appeared due to the publication on Internet of a complete and well documented interface to back-office data and company’s business logic. One of the main security problems associated with the adoption of WS is derived from the Internet publication of business interfaces through ports HTTP 80 or HTTPS 443 (O’Neill et al., 2003).

2. Protecting the Semantic Web by “ensuring that security is preserved at the semantic level” (Ferrari, 2005).

3. Context-aware and context-based protection at the document level (Bhatti, Bertino, Ghafoor, & Joshi, 2004; Bertino, Castano, & Ferrari, 2001). Documents usually have information with different “degrees of sensitivity” which require protection at different levels of security. Today, access control policies that govern access to the different security parts of the documents and an architecture enforcing these policies constitute a very important research area in the context of WS security.

4. Service trustworthiness. Dynamic discovery and composition of services implies that a Web service consumer may not know whether the services, individually or composed, are going to behave as expected. “Consequently, how to select trustworthy Web services remains a challenge” (Zhang & Chung, 2004).

So, during the processes of migrating legacy systems into Web-based systems, some legacy might be replaced and some might be able to be reserved, it depends on what is actually happening. And before the beginning of the project, the company needs to know which kind of Web-based systems you do need. Because there is no common Web-based solution exists on this world at least now. The company needs have a suitable, unique and flexible Web-based solution which base on the company’s actual situation. In other words, the company needs build a perfect project plan except a good project team.
4 Empirical Findings

In this chapter, the author will describe his empirical findings in investigation with detail, including the presentation of the company and its IT environment. In order to reach better validity of the research, the author used instructional study, which basically follows the structure of the theoretical framework.

On the basis of the theoretical framework, and by taking a critical look at my research problem and objective, it became obvious and convenient that this part will focus on data collection with the following variables: benefits and opportunities, risks and challenges and the perspective of Web-based enterprise.

4.1 MHD Company

This whole chapter is a summary of an interview with Jeff Cheung (personal communication, 2008-04-24) through video conference. Jeff have already worked for much more than 6 years as the supervisor of the IS/IT department in MHD as well as a senior IT system architecture analyst. He is very familiar with the MHD’s IS/IT environment and IT technology. This is why the author decides to choose him as an interviewer for this research. In fact, after have spoken to Jeff, the author knows that he is so appropriate to this interview.

4.1.1 Company General Information

The company Moët Hennessy Diageo was jointly established by the luxury products group LVMH (Moët Hennessy Louis Vuitton) from France and Diageo from UK, for the marketing development & service of high premium imported wine & spirits products in China. The range of products covers the famous & leading position brands of Cognac, Whisky, Champions & Wines which including Hennessy cognacs, Johnnie Walker whiskies, Moët and Veuve Clicquot champagnes, F.V.O. cognac, and etc.. Products are distributed in the restaurants, bars, nightclubs, international hotels, chain stores as well hypermarket. By representing and distributing premium spirits from all over the world to China, MHD has been offering a discerning palate for connoisseurs in China.

Shanghai office is the headquarters of MHD. There are a lot of branch offices throughout the whole china mainland, including Beijing office, Guangzhou office and Chengdu office etc. Here, there is one thing need to be mentioned is that only Guangzhou office has a permanent IT system administrator besides Shanghai office. Basically, there are almost 320 staffs in MHD, and one half of them are in Shanghai office.
4.1.2 Company IS/IT Solution

Obviously, Shanghai office is a core of MHD whatever on business strategy or IS/IT strategy. Actually, MHD is separated into three different areas on IS/IT strategy: north area, south area and east area. Among this environment, Shanghai is a core of east area, Beijing is a core of north area and Guangzhou is a core of south area. There are several important servers in Beijing office and Guangzhou office respectively besides Shanghai office, like mail server and BS server. But, they need to synchronize their databases with servers which are located in Shanghai office.

Through the deeply investigation of the MHD IS/IT environment, the author drew the map of the company’s IT system architecture, which is showed as Figure 5:

![Figure 5 MHD IS/IT Environment](image)

Source: Own prepared (2008)

From this figure, we can obviously see Shanghai office is the core of MHD on IS/IT strategy. Here, staffs are divided into 4 different methods to access the company’s network base on the locations, which include local office (Shanghai office), branch office (Guangzhou and Beijing etc.), and warehouse, outside company with Internet and outside company with GPRS.
There are primary 6 servers in Shanghai office of MHD, which are:

- BS Server: Business Support server, which is used to store the data on customers (address, phone number, outlet information etc.), primary used by sales department.
- SAP: Business Software Solutions Applications and Services, which is used to store the data of sale (create relative sales report forms etc.), primary used by finance department.
- Terminal Server: provides a windows desktop to multiple user terminals, multiple clients can access the terminal server simultaneously through the network.
- Mail Server: here means Lotus Notes 7.0 server, staffs can use mail services to communicate inside or outside by E-mail.
- Web Server: used to share and publish information, communicate each other through BBS (local network).
- File Server: used to store and share data.

4.1.3 The Perspective of Web-based Solution

As Jeff said the Web-based solution has been adopted by the company almost several years ago. To company, it is really a long project to implement the migration. At the beginning, no servers enable the Web-based information service, users have to work at the company, and all servers can be accessed through the local network. It is almost impossible for the clerks who went on errands or on vacation to access or use the company resources, even when emergency happens.

The migration was implemented in a ‘Big Bang’ on servers like Mail Server, BS Server, File Server and Terminal Server etc... Virtually, this is a gradual process (almost much more than 6 months), which starts from mail server up to web server (a new server, which is built at the end of last year). Anyway, now staff can access the company network and use its resources wherever they are. Through this new IS/IT system architecture, warehouse can communicate offices easily, which means the stocks can be updated instantly. They even give some login accounts to several important providers and customers. This really improves the agility, functionality, flexibility and practicability.

Considering on the security of web application, staffs that are outside of Shanghai office only can access company network through settled VPN. Clerks in the branch offices can directly access servers of Shanghai office with the company computer. People who are not in the area of neither in Shanghai office nor in branch offices have to use the computer with AT&T software to access the company network except PDA users. As a lot
of sales people always need to work outside with PDA to access BS server, so the company set up a special channel base on GPRS.

In Jeff’s opinion, some benefits are visible after MHD implementing the migration of Web-based enterprise, which shows as the followings:

- Improve efficiency
- Cost-effective of network maintenance
- Modernized company IT circumstance
- Increase staff satisfaction
- More agility and functionality
5 Analysis

In this chapter, the author will analyze the perspective of Web-based enterprise on the basis of the structure of the empirical findings. As a result of the analysis, the author will present suggestions and solution upon the issues identified. Benefit Analysis

5.1 Structure of Analysis

To analysis the empirical findings with the theoretical framework in an easily comprehensible way, the author decided to separate this chapter into three following sections, including benefit analysis, risk analysis and the perspective of Web-based enterprise. The analyses of the benefit and risk are quite commonly. And deeper analysis will be extended which bases on empirical findings. At the end of this chapter, the author also has a deep look into the perspective of Web-based enterprise that important to most of companies.

5.2 Benefit Analysis

The new generation web-architecture enables built-in redundancy and easy software/hardware updates (Jesse, 2000). The platform is adjustable for different end-terminals and network bandwidths and overall training times can be significantly reduced (Hanna, 2001). Moreover, there is no need to install various software programs on the client computer, which means client workstation can be thin and thus require minimal configuration and setup activities. This is important for today’s medium or large organizations with a lot of PC client users, which allows them to hook up to the systems quickly and easily (Terplan, 1999). As we can see, to IT department, the overall burden of technical support and IS/IT maintenance can be greatly minimized and reduced than before.

The main benefits of Web-based enterprise include:

1) Effective use of bandwidth: bandwidth can be used in a more efficient way and be well estimated within the web-based solutions (Rooij, 2008).

2) Increased security and data consistency: data can be both updated on real-time and be accessed at Web time (a 24/7 world where things are expected to happen instantaneously) only through the encrypted VPN channels, and data can be prevented from being downloaded to illegal PC users (Ferrari, 2005).
3) Access to full IS functionality: by offering access to extranet or Internet, users can access all devices momentarily and everywhere with more comfortable, efficient and standardized (Hansen, 2002). Even handheld mobile/wireless devices (like PDA) can be used to access all data through GPRS or wireless access point.

In MHD, almost 1/3 of computers are laptops, which are used by employees who need always go on errands, and each of them has their own AT&T account. In other words, they can access IS systems at any time and place through the Internet, even outside the company. Besides, there are usually 5-8 backup laptops with public AT&T account in the IS/IT department, which are used in the emergency, like people without their own laptop but need outward work out of the blue. Anyway, users who are outside of the company’s network cannot access data without permissibility, this provides the security. Furthermore, branch offices can update data through VPN on real-time.

Additionally, sales who are often working outside the corporate premises, they can access the BS server through PDA with GPRS. They can input and update data instantly when they are working outside. Thus, sales managers can check data momentarily and know status on their work.

5.3 Risk Analysis

Usually, the IS/IT department of own company does not have enough ability or time to do this huge project, because their daily work on IS/IT system maintenance has already occupied their all time (Leidner, 2008). Many companies choose to hire the other professional IT companies to do the project. Although the technology of this area on Web-based solution is mature enough, it is still very important to choose an optimal partner (Wetherbe, 2008).

Like MHD, they really cost a lot of time to seek for a suitable partner with enough experience on this relative area. Virtually, the IS/IT system of MHD is very complicated, they have much more than 6 various servers with different application software and hardware. Not every IT consulting company has enough ability to deal with this complicated Web-based solution (Tuggle, 2003). If the company cannot choose the right partner, a lot of time and money will be lost, even might affect well-balanced operation of the company. Fortunately, MHD had chosen the right partner finally.

There are several different processes taking place during the life cycle of creating a successful Web-based enterprise (Dai & McIntosh, 2001). During the design phase, the system must be specified with respect to its structure, software and hardware support.
The designer has to come up with solutions to problems such as "How can I design the system so that it is easily to be used?", "How can I design the system so that it is easily maintained?" or "Which kind of requirements need to be fulfilled?" (Steve, 2002).

In MHD, before the project, some legacy systems have to be replaced, like the old terminal server and file server with NT 4.0 operator system, which even cannot install web service. During this process, the IT staffs had to backup and restore data except to set up new servers, thus large numbers of overtime were needed. To ensure so many various systems can work together very well, the new IS/IT system need to be ceaseless tested. Simultaneously, the investigations on users’ requirement have to be done.

During the phase of IS/IT system development and maintenance, the administrator usually deals with problems regarding the location of information (Cleary, 2000). Compare with before, IS/IT staffs need to know much more relative knowledge of IT technology. They need know about routers, VPN, firewall, switches and web technology etc.

Another thing is that the company has to take advantage of vast time to train the users how to exactly use the new IS/IT system or new equipments (Jesse, 2000). In MHD, sales use PDA HP5550 to connect BS server through GPRS. Sometimes the user needs to restart the PDA or moves to another location, because the signal of GPRS is not power enough in everywhere, and they use the external battery to enhance the usage time, it might not work very well unless reset it.

Last thing is about security, there are so many unknown or known viruses, Trojan Horse, spyware and the other illegal programs which exist on the Internet, and even spread by the internet (Bhasin, 2002). More chances to access Internet in a manner means more chances to be danger.

Once a user in MHD shanghai office got virus through E-mail, then all the company include the other branch offices got this virus either. Not like before, the virus just spread in the local network, in here means shanghai office. As one of the staffs in IS/IT department still remembers that they cost a lot of time to kill this virus and restore the data from backup server, this virus is called “word killer”, which can delete all the file with the suffix “.DOC”. The IT manager even had to send one of IT administrators to fly to some branch offices, because there were no IT administrators in some branch offices.

5.4 Discussion
Organizations would like to take advantage of the Web in its various forms (Internet, Intranet, and, Extranets), universal access and 24-hours open for their enterprise compu-
ting (Ying & Kostas, 2003). This requires the company to migrate their legacy IS/IT systems into Web-enabled IS/IT environment.

On the other hand, the emergence of electronic commerce, mobile computing and embedded wireless systems create new requirements for Web-enabled applications (Ying & Kostas, 2003). Specifically, it is becoming a trend of the utility of wireless data services; even they have not been widely enough adopted until now. But if we look at the technology trends promoting wireless Internet convergence and the obstacles are preventing their implementation.

According to David (2000), as computing becomes increasingly mobile, the limitations of third-generation cellular telephony and the wireless applications protocol become increasingly apparent. In the future, the Internet might be able to be truly wireless. Actually, many companies announce that they will enhance the usage of “wireless e-commerce”. Follow the maturation of wireless technology; most of organizations anticipate rapid growth in wireless data service, because of its unlimited, flexible, convenient and exercisable etc (Terplan, 1999). When that day is coming, staff can easily access the company’s network by PDA even mobile in everywhere through the wireless access point.

Finally, besides pre-benefits, according to IBM press, the following items will be pointed out by taking the great advantage of Web-based solution:

- easily remote access: people can access resources at anytime and anywhere
- real time update: very easy to update without delay
- easily monitor and manage network equipments: can remote manage and configure network equipments, not like before you have to do it on-site
- take full advantage of network resources: use network resources to do most of things under IS/IT environment
- make for the continuable development of business: through Web-based platform, company could do the business more effective and continuable

Except risks and benefits which I had mentioned before, there are still some reasons and factors need to be emphasized. In this MHD case study, as they said that the Web-based IT environment provides more advantages, such as cost reduce, more efficiency, user friendly. Furthermore, it can save the cost and increase the efficiency for making more profit. All those benefits and advantages offer enough reason for the company to be Web-based enterprise.
There is another thing need to know is that the IT department has to collect request from users and discuss with vendor during the whole process of the project. Like I discussed in the “Theoretical Frame” part, these factors are so important, which include planning, management, evaluating, and development. The enterprises need to pay more attention on them, which are important Critical Success Factors for the migrating project.

5.5 The Perspective of Web-based Enterprise

Small and medium enterprises (SMEs) are extremely important to many countries and therefore they should be encouraged to radically change the way their businesses are conducted (Guah, 2005). The use of a relatively low-cost Internet technology and the implementation of electronic commerce provide the opportunity for SMEs to compete on global markets with large companies and to facilitate business growth more efficiently (Hanna, 2001).

The Web-based marketing activities and Web sites design are driven by the interaction among the firm’s market offering, marketing activities and technical characteristics (Houn-Gee & Hsin-Ginn, 2001). The most effective promotional tool is the ability of the Web to carry the messages of marketing and communication professionals to targeted groups. There is also the ability to get continuous and real-time information about the customer satisfaction. Understanding what comprises a satisfied customer is an essential factor of the success in the global market competition (Lebo, 2004).
6 Conclusion

In this chapter, according to which have been discussed in the previous chapters, the author will look back relative knowledge before highlighting the problems and will give much more suggestions for further research.

To be a Web-based enterprise might be a unique opportunity for organizations to extend their capabilities and to facilitate business growth. Web-based solution dramatically and strategically changes traditional business models. Companies are now pursuing more intensive and interactive relationships with their business partners: suppliers and customers (Turban et al., 2008). Companies are being forced to search for strategies of streamlining the entire IS/IT system architecture by competitive conditions and pressures on global market. To compete effectively, companies must structurally transform its internal and external processes (Turban et al., 2008). These goals could be reached by simultaneous optimization of business processes and implementation of Web-based solutions.

In this thesis, various methods have been used to data collection, for instance in-depth interview and literature review etc. After analyzing empirical case studies, the author gets the following conclusions.

To the company like MHD, the primary reason of being Web-based enterprise is that the legacy IS/IT system cannot fulfill the requirements of growing business anymore. So they need a new IS/IT system architecture with more agility, functionality, flexibility and practicability. And these characteristics can be exactly implemented by adopting Web-based solution.

Obviously, there are many benefits can be gotten follows the implementation of Web-based solution, which includes improving efficiency, modernizing company IT environment, providing better IS/IT systems’ maintenance and providing more agility and functionality etc. But again here need to be mentioned is that the issues exist simultaneously. Like virus, the limit knowledge of staff and the other various unexpected factors. Additionally, it must be noted that the companies must be woke up to all these factors and strike a balance between them, for carrying out the maximal benefit of being Web-based enterprise.

In sum this study showed that it is worthwhile for the company to be a Web-based enterprise. Virtually, there have already been enough evidences which come from the investigation and analysis of the empirical findings testified this viewpoint, although we have to admit that there are still a lot of issues exist within the Web-based solution.
7 Limitations and Proposal for Further Studies

In this chapter, the author describes the limitations in the process of writing this thesis, and proposal for further studies in Web-based application is explored.

Since there are so many limitations exist on this thesis, which have already been mentioned in the former sections, so the author believe that some research on this area still haven’t been explored so far.

7.1 Limitations

The author believes that there are probably many more out there, although a lot of information about Web-based enterprise has been processed and many alternatives have been explored during this thesis. Admittedly, a good deal of limitations still exist which from cover to cover.

Firstly, there was just only one company used to data collection through interview. Obviously, this would be much better to write the part of empirical findings based on more companies, which could give us more insight into the relative study. But it is hard to the author as a new international student with the language problem.

Secondly, the author has to be admitted that language is the big problem. As an international student the author is still not good at English writing. Actually, this is the first time for the author to write a thesis in English with so many pages, this is really hard for the person who is still accustomed to thinking in the national language.

Last but not least, the limitation is about limited time and other resources. During the period of writing thesis, the author has a lot of the other courses need to be studied yet. Even because of other limitations, the author cannot review enough literatures or collect enough relative materials in the limited time, such as language limitation.

But anyway, the author still believes that this thesis can fulfill the original purpose for the reason why the author carries out this study with such topic.

7.2 Reflection and Proposal for Further Studies

Although this study might not be investigated deeply and widely enough, it could be a foundation for future further studies none the less. Moreover, this study belongs to a scientific study with scientific methodology.
Here, again, due to the various limitations, the author only used qualitative research method and in-depth interview to collect empirical data for analyzing and describing the perspective of Web-based enterprise. It could be much better to use more research methods to investigate the motivation for the company to adopt Web-based information services, for instance quantitative research method, observational studies, and structured interview etc.

Through experiencing this study, the author wakes up to the importance of the Web-based solution in other areas, like on-site training, online library, online electronic commerce and supply chain management etc.

Furthermore, as the vast and growing Web-based technologies come out, more and more choices would be faced by the organizations. Like wireless technology, this has already been mentioned before.

All these areas including technology and application could be conducted on studying as the further studies, which might be very interesting and valuable.

In sum, whatever enterprise you are, the author considers trustfully that Web-based information services can bring a mass of benefits for the enterprise even beyond measure, which can be proved by this thesis. Although a lot of unexpected issues exist by adopting Web-based solution, it might be still the best way for the company to be Web-based enterprise. About these issues, they will be reduced even eliminated one day in the future, which follows the mature of the Web-based technology.
References


## Appendix

### Appendix A

<table>
<thead>
<tr>
<th>Task</th>
<th>Scope</th>
<th>Priority</th>
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<tbody>
<tr>
<td>Assign Responsibility/Hire Staff</td>
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</tr>
<tr>
<td>Create Job Descriptions</td>
<td>Overall</td>
<td>1</td>
</tr>
<tr>
<td>Do Performance Appraisals (Ongoing)</td>
<td>Overall</td>
<td>1</td>
</tr>
<tr>
<td>Set Objective</td>
<td>Site</td>
<td>1</td>
</tr>
<tr>
<td>Set Mission</td>
<td>Site</td>
<td>1</td>
</tr>
<tr>
<td>Set Place</td>
<td>Site</td>
<td>1</td>
</tr>
<tr>
<td>Set Scope</td>
<td>Site</td>
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</tr>
<tr>
<td>Training</td>
<td>Overall</td>
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<tr>
<td>Set Privacy Policy</td>
<td>Site Policy</td>
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<td>Set Security Policy</td>
<td>Site Policy</td>
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<tr>
<td>Set Site Design (Unified, Distributed, Fragmented)</td>
<td>Site/Subsite Design</td>
<td>2</td>
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<tr>
<td>Enforce Page Characteristics Values</td>
<td>Page Implementation</td>
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</tr>
<tr>
<td>Enforce Page Part Values</td>
<td>Page Implementation</td>
<td>3</td>
</tr>
<tr>
<td>Maintenance Plan</td>
<td>Overall</td>
<td>3</td>
</tr>
<tr>
<td>Privacy Implementation</td>
<td>Page/Subsite Implementation</td>
<td>3</td>
</tr>
<tr>
<td>Security Implementation</td>
<td>Page/Subsite Implementation</td>
<td>3</td>
</tr>
<tr>
<td>Set Page Characteristics and Values</td>
<td>Site/Subsite Design</td>
<td>3</td>
</tr>
<tr>
<td>Set Page Function</td>
<td>Page/Subsite Implementation</td>
<td>3</td>
</tr>
<tr>
<td>Set Page Parts and Values</td>
<td>Site/Subsite Design</td>
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</tr>
<tr>
<td>Site Layout (Mirrors, Location, etc.)</td>
<td>Site</td>
<td>3</td>
</tr>
<tr>
<td>Test Suite</td>
<td>Site/Subsite Design</td>
<td>3</td>
</tr>
<tr>
<td>Determine Gatekeeper Technology</td>
<td>Site/Subsite Design</td>
<td>4</td>
</tr>
<tr>
<td>Dynamic Web Page Support</td>
<td>Site</td>
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</tr>
<tr>
<td>Implement Gatekeeper Technology</td>
<td>Site/Subsite Design</td>
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</tr>
<tr>
<td>Select Communications from Users (Forms, E-mail)</td>
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<td>4</td>
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<tr>
<td>Select Communications to Users</td>
<td>Page</td>
<td>4</td>
</tr>
<tr>
<td>Site Hardware Support</td>
<td>Site</td>
<td>4</td>
</tr>
</tbody>
</table>

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Checklist for a Web-Based Enterprise (Continued)  
Source: Jesse Feiler (2000)
Appendix B: Interview Guide

My name is Zhu Dong, I am a bachelor programme student on ‘Business and IT Management’ in Jönköping International Business School. As a bachelor student of Jönköping University, I am supposed to write a bachelor thesis as a part fulfillment of my programme. Therefore, I have decided to write on the perspective of web-based enterprise and the whole topic is: ‘Challenges and Opportunities in Migrating to Web-based Information Services’.

This interview guide is designed to enable the author collect the primary data. After analyzing these empirical findings, combine with the secondary data and based on the studying of theoretical framework about web-based enterprise, the motivation and perspective of the web-based services migration will be external described.

Moreover, it is used to interview CIO or the supervisor of the company's IT department and which covers: the background of the companies, the IT environment of the companies, the motivation for the migration, and the pay off or otherwise on investment. This therefore means the interview guide designed purely for academic purpose, the data is only used in this thesis.

1. A brief introduction of the company
2. A brief framework of the company's IT environment
3. Your position and role in the company
4. Which kind of information systems do you use?
5. Why do you want to migrate the legacy systems into web-based systems?
6. How long has the company finished the process of migration?
7. Who is the one of decision making, (e.g. CEO, IT Manager, or the others)?
8. Before migrating, which kind of performance is to be measured?
9. Describe about project cost relative to budget and completion time relative to schedule?
10. Has the company achieved prospective business result after the migration e.g. cost reduce, flexible management, easy to use.
11. Does your company think the migration is a valuable IT revolution? If yes, how do you know?
12. Considering the rapid IT development, whether your company does have any continued plans in future on the web-based development. If yes, describe it.