A Benchmarking-Based Requirement Analysis Methodology for Improving Websites

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Abstract

Benchmarking has been conceived as an important activity and adopted very frequently in many website renewal projects as well as development projects. In real practice, it has greatly helped figure out the strengths and weaknesses of the current website and, more importantly, elicit improvement requirements by comparing their services and features with competitors' websites. In spite of its importance, however, previous research shed little light on the website benchmarking. In this paper, we propose a benchmarking-based requirement analysis methodology employing a goal-driven approach for the improvement of websites. To demonstrate the usefulness of our methodology, a real-life case is illustrated.

Keywords:

Benchmarking, Website, Improvement, Goal-driven Approach, Web Quality, Investor Relations

1. Introduction

The World Wide Web(WWW) has become closely ingrained with our life and work in just a few years[1]. In such an e-business environment, a great number of corporations in the world are utilizing websites extensively to promote their identities, introduce their product and service offerings, listen to the voice of customers, and build a relationship with their shareholders and investors. For corporations, the website has become an indispensable means to achieve a competitive advantage.

The Web environment is highly competitive and dynamic[2, 3]. Most of the websites are extensively connected with each other through hyperlinks, and they can be accessed easily via Internet portals such as Yahoo! or Google. Consequently, a visitor dissatisfied with a website can jump to another in an instant with little or no switching cost. Due to this characteristic of the WWW, it is particularly important not only to build an attractive website but also to continuously improve the website to immediately reflect ever-changing business environments and customers' needs.

One of the remarkable features of a website, which is also regarded as an information system(IS), is the visibility to external stakeholders[4]. Contrary to most of the ISs such as ERP, intranet, or knowledge management systems, most websites are originally designed and constructed to be open to anonymous outside users. This 'visibility' is the most basic feature that enables us to facilitate 'benchmarking' for a website. By comparing the contents and features of a current website with those of competitors' top-performing websites and figuring out their strengths and weaknesses, corporations can improve the website easily and effectively. In practice, benchmarking has been conceived as an important activity, and thus adopted very frequently in many website renewal projects as well as development projects.

In his masterpiece, 'the Art of War,' Sun Tzu, a military general in ancient China, suggested that "if you know your enemy and know yourself, you can win all hundreds of battles"[5, 6]. This phrase clearly implies the importance of benchmarking for achieving the competitive advantage in today's fierce business environment. Many studies have dealt with benchmarking in a broad fields of management[7, 8, 9, 10] as well as information system[11, 12]. However, despite the importance and popularity of website benchmarking, the previous research shed little light on the website benchmarking.

For this reason, we propose a benchmarking-based requirement analysis methodology for improving websites, employing 'goal-driven approach'[13, 14]. The rest of this paper is organized as follows. The next section discusses the importance of benchmarking in website improvement and clarifies the definition and role of website benchmarking. Section 3 provides an overview of our methodology and also give detailed explanations of the methodology along with a real-life case of an investor

relations (IR) website. Section 4 concludes with a discussion of the study and future research directions.

2. Benchmarking for Website Improvement

2.1. The Importance of Benchmarking in the Website Improvement

Before we deal with our methodology, we briefly discuss why benchmarking is of importance in improving websites. The needs of website users are ever-changing and very volatile[4]. Increasingly, the users expect more intriguing and attractive services and features from websites. Moreover, information technologies are rapidly evolving, and corporations often find beneficial opportunities by employing the new technologies in their Web business. Accordingly, it is important for the corporations to make a lot of efforts to apply such ever-evolving information technologies to their websites in order to obtain or maintain business competitiveness.

In this context, companies are required to possess rapid execution capabilities to improve their websites frequently and in a short time. The key points of the capabilities are that corporations should be able to capture improvement points of their websites and specify solution details more quickly. However, it is common that their requirements are usually defined ambiguously and subject to some changes during improvement processes.

If so, how can we cope with such requirements for improving websites? Our answer to this question is based on benchmarking-based approach. This approach is useful in quickly concretizing improvement requirements. Nevertheless, existing methodologies for website development do not include systematic mechanisms to perform benchmarking activities; they fail to incorporate the results of those activities into the methodologies.

2.2. The Definition and Roles of Website Benchmarking

Based on our points of arguments that have been discussed until now, we give the definition of website benchmarking as an activity to evaluate existing website and competitors' best websites, find out the strengths and weaknesses of the former, analyze the gap, and generate improvement requirements that can be adopted in actual implementation, for the purpose of making websites more competitive.

There are four roles of website benchmarking. First of all, as Andersen and Pettersen[16] mentioned, we can find sources for improvements and new ways of doing things – constructing websites – outside our organization through benchmarking. Secondly, benchmarking can concretize users' vague requirements and address the volatility of requirements. Thirdly, as Tutcher[17] pointed out, it can break the inspective approach which circumscribes the boundary of improvement. Lastly, because many researchers have pointed out that benchmarking is a useful organizational learning tool[18, 19], knowledge and practices of website administrators and developers that have been accumulated through benchmarking will be of value to manage websites or build other websites.

3. Methodology and a Real-Life Case

3.1. Methodology Overview

In our methodology, we will adopt AWARE(Analysis of Web Application REquirements) model[14] based on 'goal-driven approach.' Goal refers to the objective and target of achievement for a system, and goal-driven approach focuses on why systems are constructed by expressing the rationale and justification for the proposed systems[13]. In AWARE model, each stakeholder's goals are identified, sub-goals and tasks are divided from such goals, and then requirements that can fulfill goals, sub-goals, and tasks are derived. Goals, tasks, and requirements are depicted in a hierarchical diagram, which we call 'Goal-Task-Requirement (GTR) Diagram.' In addition, such requirements are classified into 8 taxonomies – content, structure of content, access paths to content, navigation, presentation, user operation, system operation, and interaction.

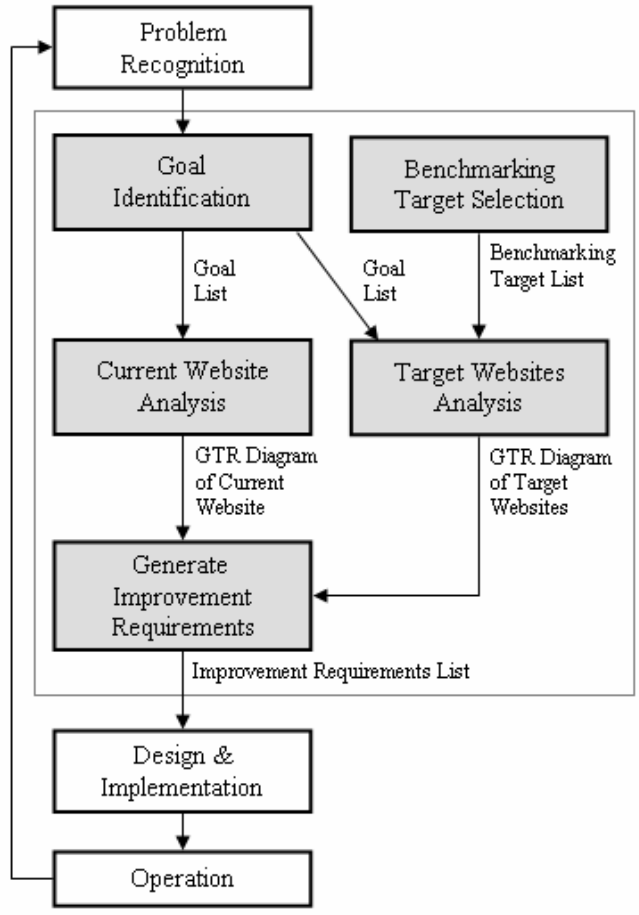

Figure 1. Steps of the Website Improvement

Figure 1 depicts the steps of the website improvement.

After problems of a current website and the necessity of improvements are recognized, users' high-level goals are identified by brief interviews or surveys. With the identified goals, we analyze the current website using GTR Diagram. Then, by using specific criteria, target websites for benchmarking is chosen, and these targets are also investigated with GTR Diagram. By comparing the two GTR Diagrams, we can generate improvement requirements, and such requirements can be used in the following design and implementation steps. The detailed explanations of the methodology and a real-life case will be provided in the next subsection.

3.2. Methodology Detail with a Real-Life Case

3.2.1. Introduction to H Telecom

H Telecom is the second largest telephone and broadband Internet service provider in Korea and listed on KOSDAQ(one of stock exchange markets in Korea) in 1998 and on NASDAQ in 2000. Its business area comprises local and international phone services, broadband Internet services for corporations and individuals, and other telecommunication services.

The literature has pointed out that investor relations(IR) is a strategic means of increasing recognition of key audiences such as customers, shareholders, and investors[20]. Furthermore, as Internet has had a great impact on all parts of corporation management, it also changed many aspects of IR. Many enterprises have developed IR website for the purpose of sharing financial and business information and communicating with a greater number of investors and shareholders timely and effectively[21, 22, 23].

Nonetheless, H Telecom has overlooked the increasing importance of IR website. The current IR website, which is linked to the official website, is poor in contents, and provides few interaction functionalities. Recognizing the necessity of enhancement of IR website, H Telecom decided to undertake a renewal project of IR website.

3.2.2. Goal Identification

To identify stakeholders' goals, we conducted brief interviews with 5 individual investors – one of main stakeholders of IR website – and asked them for what purposes they usually visit IR website. From the results of interviews, we identified five main goals as follows.

- To get stock price information
- To retrieve financial statements and indicators
- To obtain various kinds of corporate reports
- To know business performance and outlook
- To find IR event information

In this paper, we will focus on the first goal – to get stock price information because of the limitation of space.

3.2.3. Benchmarking Target Selection

To select benchmarking target, three issues are raised. The first question is "by what criteria target the websites should be chosen?" It may be quite difficult to select top-performing websites from numerous competitors' websites. For that matter, we recommend that targets should be selected by using website ranking information provided by third party agents such as Alexa.com or GoogleRankings.com. In this case, we decide to refer to '2005 IR global Rankings' (http://www.irglobalrankings.com/), which evaluates 426 IR websites in 42 countries and 13 industries according to its technical criteria including content, technology, interactivity, design, timeliness, and flexibility.

The second issue is how many target websites we need to choose. This involves issues of efficiency and effectiveness of benchmarking. Some researchers recommended that the number of benchmarking targets should be limited for efficiency of benchmarking[18, 24]. On the other hand, other scholars advocated selecting a large number of benchmarking targets for effectiveness of benchmarking[18, 25]. Nevertheless, it is not straightforward to give a definitive answer to the question here, and we will reserve this issue for further research.

The last issue is whether benchmarking targets should be selected within an industry or across industries. Freytag[5] stated that benchmarking across industries can give new inspirations to other industries, whereas it may be difficult to transfer practices across industries. However, we support that the advantages of cross-industry selection outweigh those of within-industry selection as Vorhies and Morgan[18] empirically demonstrated.

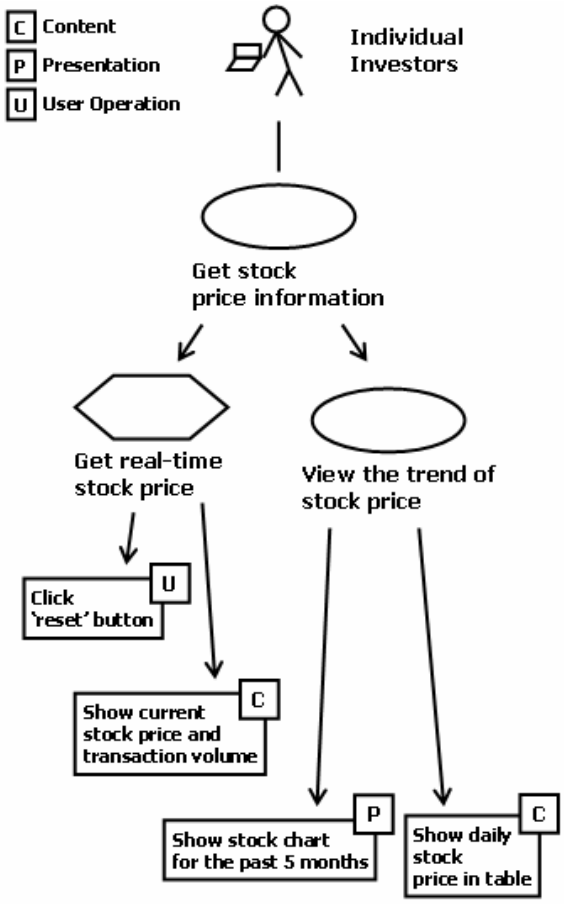

Figure 2. Goal-Task-Requirement Diagram of Current Website

Based on the discussions until now, we selected six benchmarking targets – two from direct competitors, two from best IR websites in telecom & media industry enlisted in IR Global Rankings, and two from best IR websites in other industries enlisted in the same website. Table 1 shows the benchmarking target of our case.

Table 1. Benchmarking Target List

Company	Country	IR Global Rankings
Domestic competitors		
KT Corporation (http://www.kt.co.kr/)	Korea	155
SK Telecom (http://www.sktelecom.com/)	Korea	N/A
Best IR websites in telecom industry		
Bell Canada Enterprise (BCE) (http://www.bce.ca/)	Canada	4
Telekom Austria (http://www.telekom.at/)	Austria	13
Best IR websites in other industries		
Bayer (http://www.bayer.com/)	Germany	1
Unibanco (http://www.unibanco.com/)	Brazil	8

3.2.4. Current Website Analysis

In current website analysis, we should answer this question – 'how does the existing website support a specific goal?' By examining contents and functionalities of the current goal like 'get stock price information', we can draw Figure 2.

As shown in Figure 2, the goal can be divided into one task – 'get real-time stock price' – and one sub-goal – 'view the trend of stock price.' While the former is one of users' specific activities, the latter can be implemented by various functionalities. Therefore, we can categorize the former into a task and the latter into a sub-goal. To support the first task, the existing website provides current stock price and transaction volume in the first page of IR website and places 'reset' button that updates stock price information. For the second sub-goal, the current website exhibits daily stock prices for the past 5 months in graph and table format.

3.2.5. Target Websites Analysis

In target website analysis, we should answer this question – 'how do the target websites support a specific goal?' With the same method of analyzing the current website, we investigate 6 target websites and draw Figure 3. '<K>' represents that a certain requirement comes from a website of KT Corporation. By comparing Figure 3 with Figure 2, we can ascertain stark contrasts between current

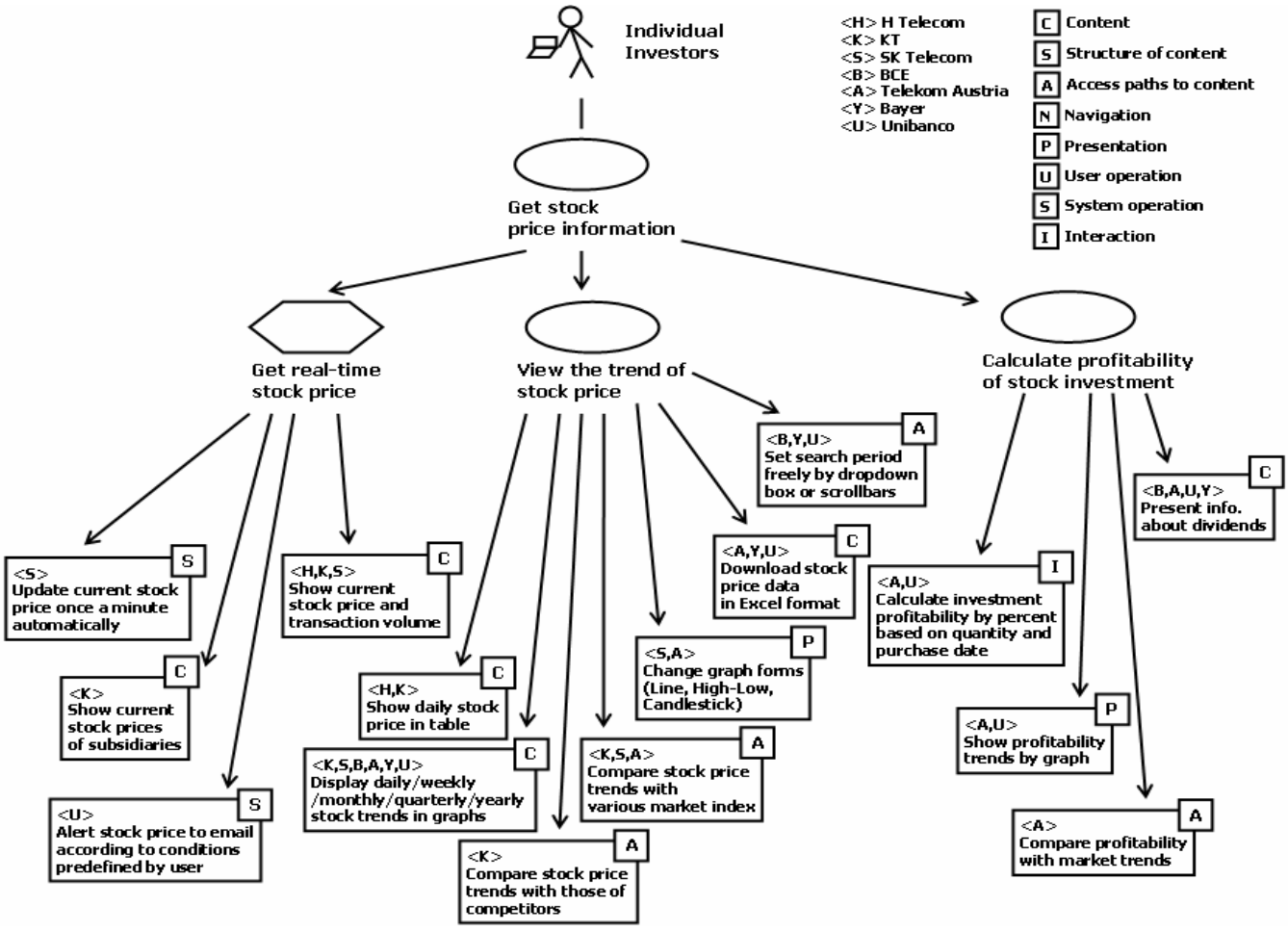

Figure 3. Goal-Task-Requirement Diagram of Target Websites

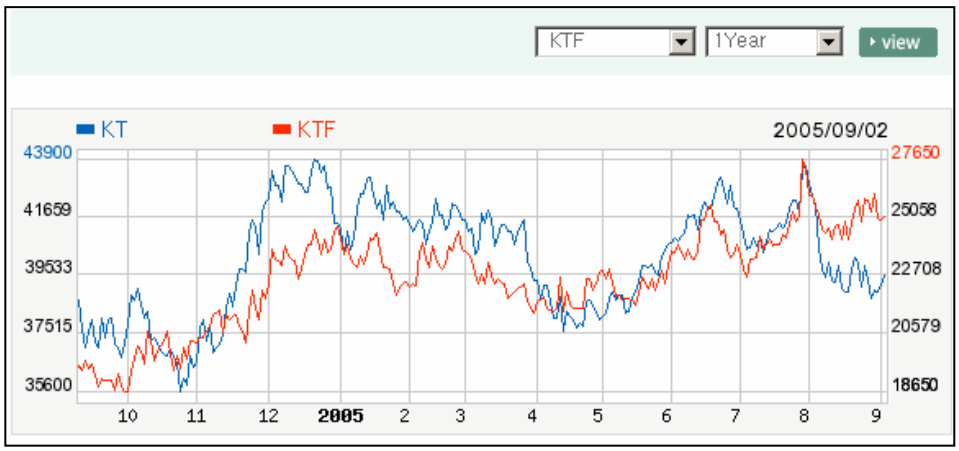

Figure 4. Stock Price Comparison with Competitors in KT Website

H Telecom IR website and target websites.

First of all, for the task 'get real-time stock price,' users in H Telecom website must click 'reset button' to view updated real-time stock price, whereas users in SK Telecom website can see stock price information updated every minute automatically. In addition, we can discover an interesting service from Unibanco website – 'Stock Price Alert'. In this service, if a user input his or her email address and an alert condition (price, change, or volume), the website sends an email message about current stock price to the user as soon as the condition the user sets meets.

Secondly, for the sub-goal, 'view the trend of stock price,' while the stock chart in H Telecom is very simple, in target websites of SK Telecom and Telekom Austria, not only are the daily, weekly, monthly, and quarterly trends of stock price displayed in graph, but also users can change chart forms (line, high-low, candlestick). Moreover, in the KT Corporation website (Figure 4), the stock price chart shows the trends of various market indices and those of competitors' stock so that investors can evaluate the market performance of KT stock straightforwardly.

Thirdly, the sub-goal, 'calculate profitability of stock investment,' has not been found in current website analysis steps, and it is what current website users and IR staffs of H Telecom have not realized. In 'Investment Calculator' service of Telekom Austria website (Figure 5), if an investor enters the date when he or she purchased Telekom Austria stock, purchased quantity, the current stock price, the ratio of change, and the amount of loss or gain are calculated. Furthermore, the trend of stock price is displayed in chart from purchase date. A similar service can be found in Unibanco website.

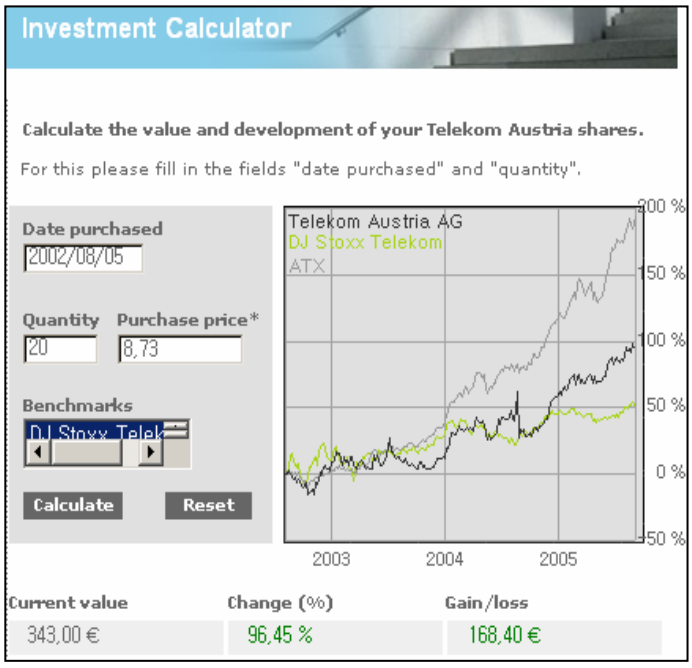

Figure 5. Investment Calculator in Telekom Austria

3.2.6. Improvement Requirements Generation

From the analysis of the existing and target websites, we can elicit some useful improvement requirements. Broadly, we concluded that the current IR website of H Telecom strongly needs to be enhanced from the point of view of 'contents'[26] and 'interactivity'[27]. We concluded that website developers should make efforts to improve the width and depth of contents in the website and provide more current and timely information. In addition, in order to reinforce the interactivity of the website, the improved website should provide dynamic information, customized according to selections and conditions set by users, rather than simply display static one.

More detailed improvement requirements can be derived from Figure 3, and such requirements can be applied in the following design and implementation phases. What must be taken into consideration here is the duration and budget constraints in the whole project. In other words, website developers need to ponder upon the effectiveness and feasibility of all improvement requirements.

4. Conclusion

In this paper, we propose a benchmarking-based requirement analysis methodology for improving websites and showed a real-life case of IR website. We believe that this is the first attempt to bridge the gap between website development methodology and benchmarking by providing useful artifacts that can be readily applicable to real projects.

Yet, there are some limitations in our research. Firstly, it is necessary to elaborate our methodology further so that it can capture users' needs and improvement requirements more meticulously.

Secondly, the methodology now focuses on analysis

phase in system development life cycle, but it needs to be expanded into design and implementation phases in order to support the implementation in a complete fashion.

Lastly, Boxwell[28] pointed out that one possible limitation of benchmarking is 'copycatting', and he criticized that benchmarking can reduce creativity and may be detrimental in the long run. We agree that adhering just to benchmarking in improving websites can only marginally contribute to actual improvements. Surpassing top-performing competitors requires high levels of creativity and innovation, and huge amount of investments and efforts. We are in the process of overcoming this obstacle and will report as soon as robust results are obtained.

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