

Learning the Requirements Engineering Process of the Online Hotel Reservation System

Wint Wah Loon, Haymar Aung, Hlaing Htake Khaung Tin

University of Computer Studies, Yangon, Myanmar

goddnesswint@gmail.com, whitesnowcu@gmail.com, hlainghtakekhaungtin@gmail.com

Abstract

The goal of the requirements engineering process is to create and maintain a system requirements document. The overall process includes four high-level requirements engineering sub-processes. The Online Hotel Reservation System (OHRS) is an online web-based system with specified majorities in the field of hotel online reservation system. The objective of this paper is to increase the global reach of a hotel website. Through it, hoteliers are able to launch hotel website so that various users around the world can access the website. Thus it increases the chances of a number of booking.

Keywords— Online, Hotel Reservation, Requirement Engineering Process, booking, feasibility study.

I. INTRODUCTION

Online Hotel reservations systems are becoming a very popular method for booking hotel rooms. Travellers can book rooms from home by using an online security to protect their privacy and financial information.

The people involved develop a better understanding of what they want the software to do; the organization buying the system changes; modifications are made to the system's hardware, software and organizational environment. The process of managing these changing requirements is called requirements management.

Online hotel reservations are becoming a very popular method for booking hotel rooms. Travellers can book rooms from home by using online security to protect their privacy and financial information and by using several online travel agents to compare prices and facilities at different hotels. People can book directly on an individual hotel's website. An increasing number of hotels are building their own websites to allow them to market their hotels directly to consumers. Non-franchise chain hotels require a "booking engine" application to be attached to their website to permit people to book rooms in real time. One advantage of booking with the hotel directly is the use of the hotel's full cancellation policy as well as not needing a deposit in most situations. [1].

II. LITERATURE REVIEW

The application of the Internet in the business world has become a major trend in practice and generated a hot stream of research in the recent literature. The Internet, as a collection of interconnected computer networks, provides free exchanging of information. Over 400 million of computers or more than 400,000 networks worldwide today are communicating with each other (Napier, Judd, Rivers, and Wagner, 2001). As such, the Internet has been becoming a powerful channel for business marketing and communication (Palmer, 1999), and for new business opportunities as it is often called as "e-business" or "e-commerce" today (Schneider & Perry, 2001). This new e-business or e-commerce virtual marketplace allows small companies competing with business giants by just having a better web presentation of their products and services. Under the same wave, online customers can enjoy a wider choice of products or services, more competitive prices, and being able to buy their favourite items/services from the sellers located thousands miles away. It provides communication between consumers and companies and through electronic data interchange (EDI), buyers and sellers can exchange standard business transactions such as invoices or purchase orders with remarkable ease.[1]

There are several benefits of OHRS. It makes the reservation process computerized and thus helps one to undertake a large amount of transactions at a low cost. It lets the hotel in charge of over margins and pricing strategy. It enables one to check available inventory and complete an online booking form making the reservation process more efficient and less time consuming. The clients can settle the room rates and special offers at no extra cost. OHRS assists hotel's guests and agents with different payment options such as credit/debit cards. The system can track hotel's performance on a regular basis as all information concerning payments is updated online and sent to the reservation manager by means of e-mail or mobile messages.

Hotel Management System operates a global online hotel reservation system for business and leisure travellers. To compete with the international e-marketplace, a great deal of attention should pay towards the optimization of user requirements to generate recommended hotel alternatives.[2] The manual hotel management is subdivided into section with each section having specific tasks. These tasks will however from time to time interact operationally to achieve organizational objectives. The mode of interaction consists of all characteristics of a typical manual system i.e. communication through verbal means, documents etc. This now leads to computerization of hotel management [3].

Kim and Kim (2004) conducted a study to find if online reservations for a hotel were affected by purchaser's demographics. Their study concluded that no demographic information was significant with online purchasers and off line purchasers. However those that chose to use the internet for reservations concluded that six factors affect why they choose to continue to use the internet for booking reservations: 1. Convenience, 2. Ease of information search 3. Transaction (ease of understanding policies and placing orders), 4. Information credibility 5. Price and 6. Safety (ease of canceling and security of sensitive information (Kim & Kim 2004). Those that booked reservations offline concluded that convenience, price and safety were the significant factors affecting their decision to book a reservation via another offline method. [4]

III. WHAT IS THE REQUIREMENT ENGINEERING PROCESS

All The goal of the requirements engineering process is to create and maintain a system requirements document. The overall process includes four high-level requirements engineering sub-processes. These are concerned with assessing whether the system is useful to the business (feasibility study); discovering requirements (elicitation and analysis); converting these requirements into some standard form (specification); and checking that the requirements actually define the system that the customer wants (validation). [6]

Figure 1 illustrates the relationship between these activities. It also shows the documents produced at each stage of the requirements engineering process.

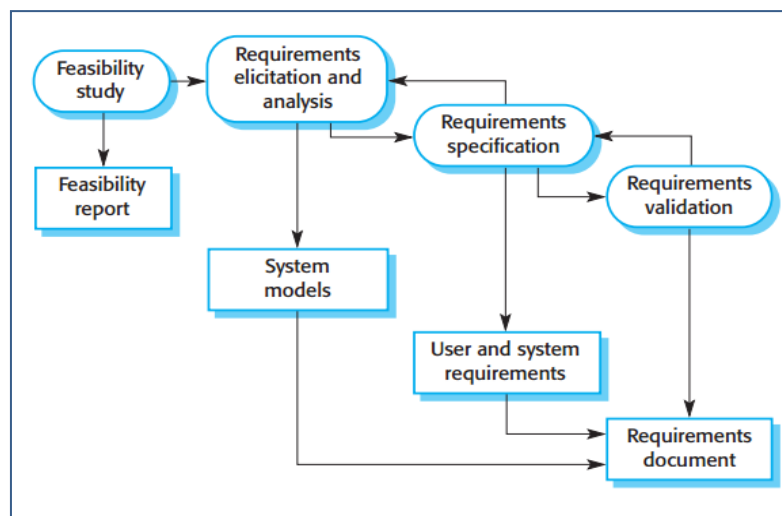


Figure 1. The requirement engineering process

The activities shown in Figure 1 are concerned with the discovery, documentation and checking of requirements. In virtually all systems, however, requirements change. The people involved develop a better understanding of what they want the software to do; the organization buying the system changes; modifications are made to the system's hardware, software and organizational environment.

A. Feasibility Study

For all new systems, the requirements engineering process should start with a feasibility study. The input to the feasibility study is a set of preliminary business requirements, an outline description of the system and how the system is intended to support business processes. The results of the feasibility study should be a report that recommends whether or not it is worth carrying on with the requirements engineering and system development process. A feasibility study is a short, focused study that aims to answer a number of questions:

1. Does the system contribute to the overall objectives of the organization?
2. Can the system be implemented using current technology and within given cost and schedule constraints?
3. Can the system be integrated with other systems which are already in place?

The issue of whether or not the system contributes to business objectives is critical. If a system does not support these objectives, it has no real value to the business. While this may seem obvious, many organizations develop systems which do not contribute to their objectives because they don't have a clear statement of these objectives, because they fail to define the business requirements for the system or because other political or organization factors influence the system procurement. Carrying out a feasibility study involves information assessment, information collection and report writing. The information assessment phase identifies the information that is required to answer the three questions set out above. Once the information has been identified, you should talk with information sources to discover the answers to these questions. Some examples of possible questions that may be put are:

1. How would the organization cope if this system were not implemented?
2. What are the problems with current processes and how would a new system help alleviate these problems?
3. What direct contribution will the system make to the business objectives and requirements?
4. Can information be transferred to and from other organizational systems?
5. Does the system require technology that has not previously been used in the organization?
6. What must be supported by the system and what need not be supported?

In a feasibility study, you may consult information sources such as the managers of the departments where the system will be used, software engineers who are familiar with the type of system that is proposed, technology experts and end-users of the system. Normally, you should try to complete a feasibility study in two or three weeks.

B. Requirement Elicitation and Analysis

The next stage of the requirements engineering process is requirements elicitation and analysis. In this activity, software engineers work with customers and system end-users to find out about the application domain, what services the system should provide, the required performance of the system, hardware constraints, and so on. Requirements elicitation and analysis may involve a variety of people in an organization. The term *stakeholder* is used to refer to any person or group who will be affected by the system, directly or indirectly. Stakeholders include end-users who interact with the system and everyone else in an organization that may be affected by its installation. Other system stakeholders may be engineers who are developing or maintaining related systems, business managers, domain experts and trade union representatives. Eliciting and understanding stakeholder requirements is difficult for several reasons:

1. Stakeholders often don't know what they want from the computer system except in the most general terms. They may find it difficult to articulate what they want the system to do or make unrealistic demands because they are unaware of the cost of their requests.
2. Stakeholders naturally express requirements in their own terms and with implicit knowledge of their own work. Requirements engineers, without experience in the customer's domain, must understand these requirements.
3. Different stakeholders have different requirements, which they may express in different ways. Requirements engineers have to consider all potential sources of requirements and discover commonalities and conflict.

4. Political factors may influence the requirements of the system. For example, managers may demand specific system requirements that will increase their influence in the organization.
5. The economic and business environment in which the analysis takes place is dynamic. It inevitably changes during the analysis process. Hence the importance of particular requirements may change. New requirements may emerge from new stakeholders who were not originally consulted.

C. Requirements Specification

The activity of translating the information gathered during the analysis activity into a document that defines a set of requirements. Two types of requirements may be included in this document. *User requirements* are abstract statements of the system requirements for the customer and end-user of the system; *system requirements* are a more detailed description of the functionality to be provided. The activities in the requirements process are not simply carried out in a strict sequence. Requirements analysis continues during definition and specification, and new requirements come to light throughout the process. Therefore, the activities of analysis, definition and specification are interleaved.

D. Requirements Validation

Requirements validation is concerned with showing that the requirements actually define the system that the customer wants. Requirements validation overlaps analysis in that it is concerned with finding problems with the requirements. Requirements validation is important because errors in a requirements document can lead to extensive rework costs when they are discovered during development or after the system is in service. The cost of fixing a requirements problem by making a system change is much greater than repairing design or coding errors. The reason for this is that a change to the requirements usually means that the system design and implementation must also be changed and then the system must be tested again.

During the requirements validation process, checks should be carried out on the requirements in the requirements document. These checks include:

1. Validity checks

A user may think that a system is needed to perform certain functions. However, further thought and analysis may identify additional or different functions that are required. Systems have diverse stakeholders with distinct needs, and any set of requirements is inevitably a compromise across the stakeholder community.

2. Consistency checks

Requirements in the document should not conflict. That is, there should be no contradictory constraints or descriptions of the same system function.

3. Completeness checks

The requirements document should include requirements, which define all functions, and constraints intended by the system user.

4. Realism checks

Using knowledge of existing technology, the requirements should be checked to ensure that they could actually be implemented. These checks should also take account of the budget and schedule for the system development.

5. Verifiability

To reduce the potential for dispute between customer and contractor, system requirements should always be written so that they are verifiable. This means that you should be able to write a set of tests that can demonstrate that the delivered system meets each specified requirement.

A number of requirements validation techniques can be used in conjunction or individually:

1. Requirements reviews

The requirements are analysed systematically by a team of reviewers. This process is discussed in the following section.

2. Prototyping

In this approach to validation, an executable model of the system is demonstrated to end-users and customers.

3. Test-case generation

Requirements should be testable. If the tests for the requirements are devised as part of the validation process, this often reveals requirements problems. If a test is difficult or impossible to design, this usually means that the requirements will be difficult to implement and should be reconsidered. Developing tests from the user requirements before any code is written is an integral part of extreme programming.

IV. OBJECTIVES OF THE ONLINE HOTEL RESERVATION SYSTEM

The objectives of the online hotel reservation system are:

- To increase the global reach of a hotel website.
- Through it, hoteliers are able to launch hotel website so that various users around the world can access the website. Thus it increases the chances of a number of booking.
- It saves a lot of time and effort for customers as they can conveniently book hotel rooms from their home.

V. ROLE OF THE REQUIREMENTS ENGINEERING PROCESS IN ONLINE HOTEL RESERVATION SYSTEM

For all new systems, the requirements engineering process should start with a feasibility study. The input to the feasibility study is a set of preliminary business requirements, an outline description of the system and how the system is intended to support business processes. The results of the feasibility study should be a report that recommends whether or not it is worth carrying on with the requirements engineering and system development process. A feasibility study is a short, focused study that aims to answer a number of questions: [6]

1. Does the system contribute to the overall objectives of the organization?
2. Can the system be implemented using current technology and within given cost and schedule constraints?
3. Can the system be integrated with other systems which are already in place?

The issue of whether or not the system contributes to business objectives is critical. If a system does not support these objectives, it has no real value to the business. While this may seem obvious, many organizations develop systems which do not contribute to their objectives because they don't have a clear statement of these objectives, because they fail to define the business requirements for the system or because other political or organization factors influence the system procurement. Figure 2 shows the data flow diagram of this system and figure 3 shows the ER diagram of online hotel reservation system.

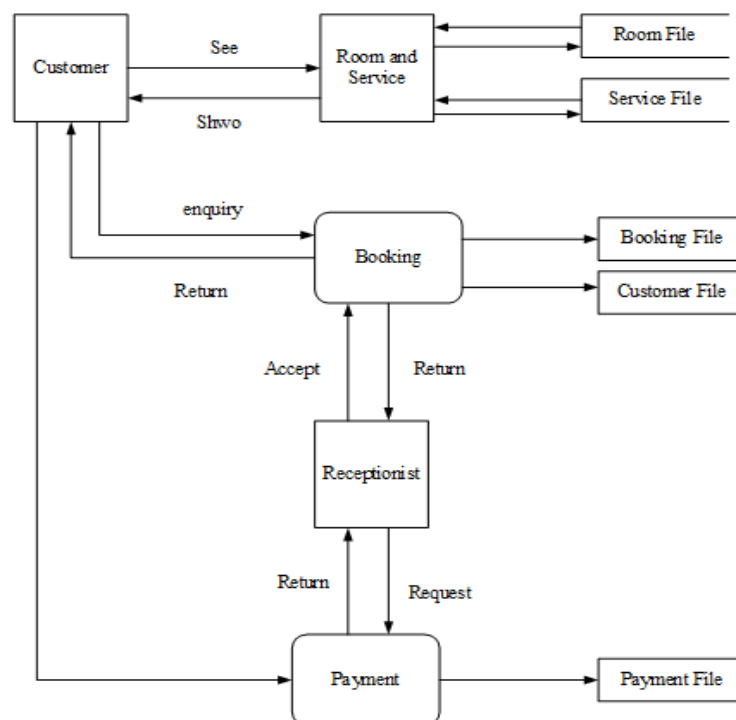


Figure 2.The data flow diagram of the online hotel reservation system

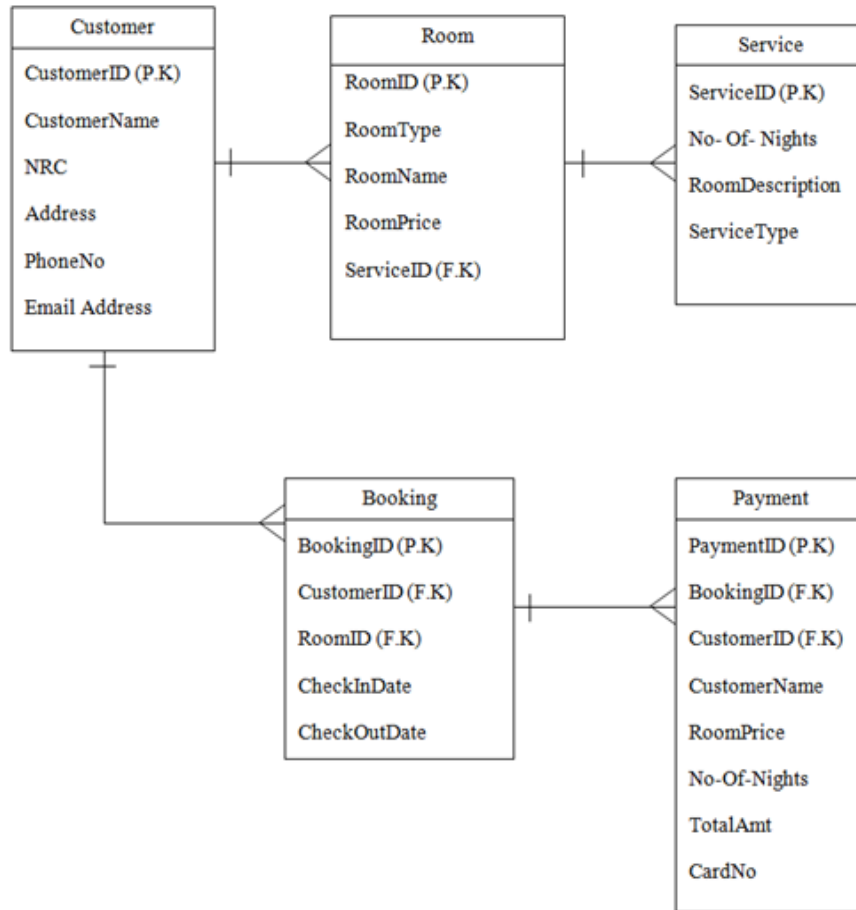


Figure 3. The ER diagram of the online hotel reservation system

VI. CONCLUSIONS

The Online Hotel Reservation System was developed to replace the manual process of booking for a hotel room or any other facility of the hotel. This paper can support learning the requirement engineering process for online reservation system. And also learn the four high-level requirement engineering process details. We can study during the requirements validation process, checks should be carried out on the requirements in the requirements document.

ACKNOWLEDGMENT

I would like to thank all of my current and previous colleagues, teachers and friends at Computer University for their support and encouragement during my research work.

REFERENCES

- [1] Glenda A. Delizo, Mischelle A. Esguerra, "ONLINE HOTEL RESERVATION AND MANAGEMENT SYSTEM FOR THE COLLEGE OF INTERNATIONAL TOURISM AND HOSPITALITY MANAGEMENT (CITHM)", *International Journal of Computers and Technology*, volume 10, number 1, 2013.
- [2] S. Koolmanojwong, "Analysis and Design of B to C E- Marketplace for Tourism with UML " M.S. Thesis, Faculty of Science and Technology, Assumption University, Bangkok, Thailand 2000.
- [3] Ogirima Sanni Omuya "Computerized Hotel Management". Unpublished Higher National Diploma (HND) dissertation, Department of Computer Science, Kwara State Polytechnic, Ilorin, Nigeria.
- [4] Kim, W. G. & Kim, D. J. (2004). Factors affecting online hotel reservation intention between online and non-online customers. *International Journal of Hospitality Management*, 23, 381-395.
- [5] Ryan Smith, "The Impact of Online Reservation System for chain restaurant".
- [6] Ian Sommerville, "Software Engineering 8th Edition".

ABOUT AUTHOR



I received the B.C.Sc degree Computer University(Taungoo) at 2009. Now I am attending the M.C.Sc(Q) Class at University of Computer Studies, Yangon, Myanmar.



I received the B.C.Sc degree from Computer University (HinThaDa) at 2013. Now I am attending the M.C.Sc(Q) Class at University of Computer Studies, Yangon, Myanmar.



I received the B.C.Sc and B.C.Sc (Hons:) degree from Government Computer College, Lashio, Northern Shan State, Myanmar in 2003, the Master of Computer Science (M.C.Sc) degree from University of Computer Studies, Mandalay, Myanmar in 2006 and the Ph.D(IT) degree from University of Computer Studies, Yangon, Myanmar in 2014 January. My research interests mainly include face aging modelling, face recognition, perception of human faces and information technology (IT).