e-Billing System for e-Clinical Support System

Ho Zhen Hong

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JUDUL: E-BILLING SYSTEM FOR E-CLINICAL SUPPORT SYSTEM

SESI PENGAJIAN : 2015/2016
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(TANDATANGAN PENULIS)

Alamat tetap: No.139, Lorong 3, Taman Desa Baiki, 36000 Teluk Intan, Perak.

Tarikh: 26/8/16

(TANDATANGAN PENYELIA)

PROF. MADYA DR. MOHD KHANAPI BIN ABD GHANI
Profesor Madya
Jabatan Kejuruteraan Perisian
Fakulti Teknologi Maklumat dan Komunikasi
Universiti Teknikal Malaysia Melaka (UTeM)

Nama Penyelia

Tarikh: 26/8/2016

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E-BILING SYSTEM FOR E-CLINICAL SUPPORT SYSTEM

HO ZHEN HONG

This report is submitted in partial fulfillment of the requirements for the Bachelor of Computer Science (Software Development)

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2016

DECLARATION

I hereby declare that this project report entitled

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is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ Date: 26/8/16

(HO ZHEN HONG)

I hereby declare that I have read this project report and found this project report is sufficient in term of the scope and quality for the award of Bachelor of Computer Science (Software Development) With Honours.

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Dedication

I would also dedicate this project to my important spiritual pillars which are my dearly parent and fellow friends. My parent always providing me endless encouragement whenever I depressed throughout my years of study whereas my fellow friends always giving so much supports and comments during the process that able to help me complete this project.

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Abstract

E-Billing System is a system that allow an organisation to manage their financial health and billing process electrically. The bill and report will be send to customers in digital format. This project is aim to develop a e-Billing System for e-Clinical Support System (e-CSS). This system included modules of generate itemised bill, collect payment, manage bill, manage miscellaneous item, manage billing parameter, generate report and year-end processing. From the analysis that done on previous billing system, those systems helped organization save many cost after implementing it.

The system developed by using Software Development Life Cycle (SDLC) with application of Agile methodology during the development processes. The reason is that Agile development allow the system respond to the changes of requirements easily. The system undergoes testing phase after the implementation of system is completed. Therefore, a set of test data, test cases, and quick reference is designed for user acceptance test. The results from user acceptance test showed that many modules have over 70% of pass rate and about 30% failure. Thus, the discovered failure is fix after the testing phase.

At the end of the project, e-Billing System is integrated to the e-CSS system. The system will be used by UTeM clinic and computerized manual billing process. All records and bills is generated and stored in digital format. The e-Billing System still having lot possible improvement can be made in future.

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Abstrak

Sistem Pembayaran adalah satu sistem yang membolehkan organisasi untuk menguruskan proses kesihatan dan kewangan mereka secara elektrikal. Bil dan laporan akan dihantar kepada pelanggan dalam format digital. Projek ini adalah bertujuan untuk membangunkan Sistem e-Pembayaran untuk Sistem Sokongan e-Klinikal (e-CSS). Sistem ini termasuk modul menjana bil, mengutip bayaran, menguruskan bil, menguruskan item, mengurus parameter bil, menjana laporan dan pemprosesan akhir tahun. Daripada analisis yang dilakukan ke atas sistem pembayaran sebelumnya, sistem-sistem tersebut membantu syarikat-syarikat itu mengurangkan kos selepas melaksanakannya.

Sistem dibangunkan dengan menggunakan *Software Development Life Cycle* (SDLC) dengan penggunaan metodologi Agile semasa proses pembangunan. Sebabnya ialah bahawa pembangunan Agile membenarkan sistem bertindak balas terhadap perubahan keperluan dengan mudah. Sistem ini menjalani fasa ujian selepas pembangunan sistem selesai. Oleh itu, satu set data ujian, kes-kes ujian, dan rujukan pengguna disediakan untuk ujian penerimaan pengguna. Keputusan daripada ujian penerimaan pengguna menunjukkan bahawa banyak modul yang mempunyai lebih daripada 70% kadar kelulusan dan kira-kira 30 kegagalan%. Oleh itu, kegagalan ditemui telah dibaiki selepas fasa ujian.

Pada akhir projek, Sistem e-Pembayaran diintegrasikan dengan sistem e-CSS. Sistem ini akan digunakan oleh klinik UTeM dan mengantikan proses pembayaran. Semua rekod dan bil dihasilkan dan disimpan dalam format digital. Sistem e-Pembayaran masih mempunyai banyak peningkatan mungkin boleh dibuat pada masa akan datang.

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LIST OF ABBREVIATIONS

e-CSS – e-Clinical Support System

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Chapter I

Introduction

1.1 Introduction

E-Billing System of e-Clinic Support System (e-CSS) is in completion status which contain many error. Through maintenance of e-Billing System, errors and process flow of e-Billing System will be complete and billing data of patient will be stored systematically.

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1.2 Problem Statement

There are plenty problems happened on the current e-Billing System of UTeM clinic. Firstly, the e-Billing System is manually processed by staff. Loss of documents and records happened sometimes. Staff encounter difficulty when managing bill manually. Thus, it will be requiring long times when generating report.

1.3 Objectives

- To computerized manual billing system
- To store records efficiently and convenience
- To manage bill systematically and efficiently

1.4 Scope

The project scope is focus on two main categories which are client/user and functionality.

1.4.1 Client/user

The client and users of this project is hospital staffs. Hospital staffs will help patient to make their payment at the counter when they collect their medicine at pharmacy counter.

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1.4.2 Functionality

There are few functionalities that provided by e-Billing System. Users can generate bill in a click of mouse. Users can manage the bill easily. Users can manage miscellaneous item and billing parameter by themselves. Users can generate report using the e-Billing System.

1.5 Project Significant

With the e-Billing System developed in this project, users are able perform the billing process in paperless mode. Users' efficiency and productivity also increase as the e-Billing System can helps them save time compare to before. Moreover, e-Billing System provide decision support to management in easy way.

1.6 Expected Output

The E-Billing System is complete and maintain successfully. The system can generate bill, receipt and report. Users are able to manage bill, miscellaneous items and billing parameter by themselves. Users can do year end processing at the end of a year.

1.7 Conclusion

This chapter focus about the brief introduction to e-Billing System, objective and problem statement of project, and expected result from this project. Literature and journal of previous researcher will be discussing and review in the next chapter.

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Chapter II

Literature Review and Project Methodology

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2.1 Introduction

This chapter of report discusses about the facts and findings, project methodology, requirements, project schedule and milestones that are involved in this project. The field of this study is focus on the contribution of the system in the market to society, the current growth of system, and the technologies who collaborated with it.

In the methodology section described how this project develop during the development process by using agile model, one of the System Development Life Cycle (SDLC) methodology.

2.2 Facts and Findings

This section of report will describe about the researches done by other researchers.

2.2.1 Domain

In this section, the related information and previous research will be described. That information such as benefits and existing system will be analysis and defined in the following section.

2.2.1.1 Benefits of Using the System

The main benefit of implementation of e-Billing System is transform the transaction process into paperless mode, making the process become environmentally friendly. Thus, it also allows the user of e-Billing System clutter free and manage their billing data systematically.

In addition, the e-Billing System help authorities create the transparency of the transaction (Tim Wheeler 2015). Whenever a customer has question about the billing process, the information of particular billing can be easily accessible to respond to customer's doubt quickly. This is important to improve customer confident on particular business and even team morale.

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Furthermore, a customer can have his receipt sent to his phone or email when he under subscription receipt services. The subscribed customer can receive his receipt through email or SMS. Sending receipt in email is good to have better tracking of history bill and locate easily if it is a needs for product returning issue (Cara Olson, 2012).

2.2.2 Existing System

There are many existing systems in the market. For this section, some systems are selected to discuss and compare the system. In addition, research product of other researcher will also be explaining in this section.

i. H. A. Ibrahim, B. M. Nossier and M. G. Darwish (2002), E-Billing System for Internet service provider (ISP)

E-Billing System for Internet Service Provider is a system that calculate the payment of a user based on the internet usage of that user. This system came from an idea that a user trying to establish a connection to a charged network, the establish connection delay and the system will verify whether the user is ready to be charge for that connection. Whenever the user is ready, an invoice will generate based on the internet traffic usage.

The system consists of two main modules which are meter and invoice generation modules. To determine the suitability of implementation of the e-Billing System, several issues and aspect such as connection setup time, active connection count and response time will be take into account according statement from Hamdy A. Ibrahim.

ii. M. M. Islam, M. Ahmad, M. A. Islam, A. F. Mitul, M. F. Malek and M. A. Rashid (December 2012), Electronic energy meter with remote monitoring and e-Billing System

Electronic energy meter with remote monitoring and e-Billing System authored by Md. Manirul Islam is a e-Billing System that work along with the electronic energy meter. The e-Billing System will calculate the total energy used by customer and energy charge based on tariff.

The energy data that will be using to calculate the consumption of energy is collected by using remote monitoring of electronic energy meter. The system can take the reading at the center and generate the bill for customer cash card payment. Moreover, the system is using a low cost ATMEGA8L microcontroller to control the system. This microcontroller is important as it store customer information and other data in memory to produce billing information and report.

iii. P. Chandrasekar and T. Sangeetha (2014), Smart shopping cart with automatic e-Billing System through RFID and ZigBee.

The system proposed by Prof. P. Chandrasekar and T. Sangeetha is a system that provide auto-billing for customer which allow customer pay the bill without queuing in the malls or super markets through radio frequency identification (RFID) and ZigBee. By using RFID reader, the items information is store into electrically erasable and programmable read-only memory (EEPROM) and transfer to e-Billing System through the ZigBee module. When the central e-Billing System get these information, the system gets and calculate the total purchase amount of that particular cart from the items databases. In the end of the process, the customer can make payment through the system. The flow chart below explained the work flow of this system.

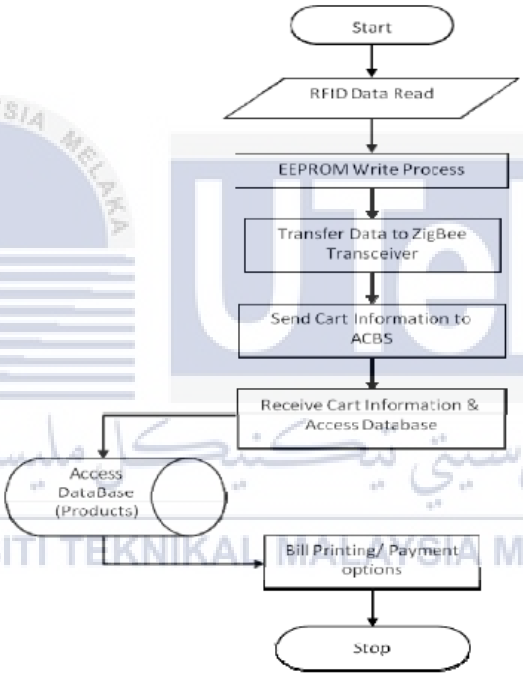

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Figure 1: Work Flow of Smart Shopping Cart

iv. M. Rodriguez-Martinez, H. Valdivia, J. Rivera, J. Seguel and M. Greer (June 2012), MedBook: A Cloud-Based Healthcare Billing and Record Management System

MedBook is a platform using open source cloud computing technologies to support electronic billing and electronic health record (EHR) operations. MedBook act as an integration point of various authorities in the healthcare delivery system such as healthcare provider, patients, healthcare payers and EHR.

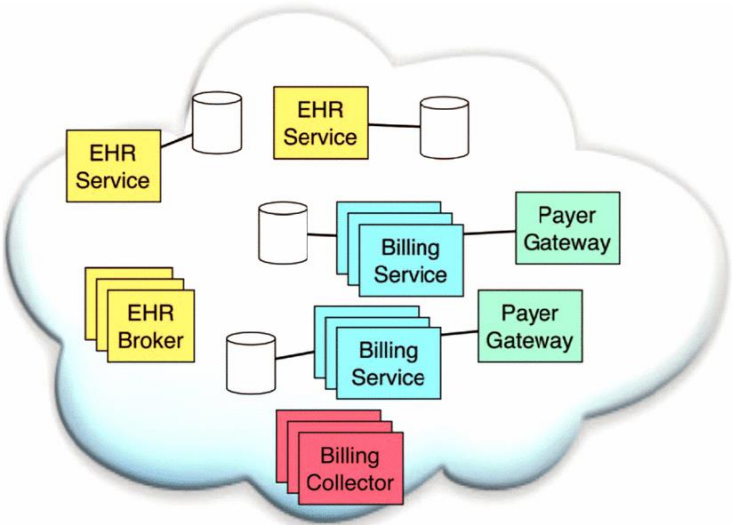

Figure 2: Medbook Service Archictecture

Figure above showed the Medbook Service Architecture. Billing collector get the billing request from health care providers and transfer to billing services for validation and the valid request is then sent to payer gateway for submission to the healthcare payer. EHR Broker is a service that locate all the pieces of a patient's EHR. This service can be accessed by the client application and billing services depending the needed of users. Whereas, EHR service allow the modification of operation to EHR segments and only can securely access using encrypted HTTPS channels because it is important as it contains the collection of EHR information.

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v. H. Abdi, Y. Le and S. Nahavandi (Feb 2013), Integration of resident's energy costs in short stay accommodation e-Billing System

Energy management system proposed by Hamid Abdi et al. at Feb 2013 is used to develop based on the integration of energy cost of room level into e-Billing System. This can allow the short stay accommodation industry to calculate and determine the energy consumption of residents accurately. By using this system, the industry can gain high level energy efficiency with low expenses. The information that collect through the system will

then be display inside the resident's accommodation bill which including energy consumption, gas emission and cost related services.

2.2.3 Technique

During the process of implement this project, there is a research technique used to collect the required information. The technique been used is empirical research which observation is the main method to get the real life data that been used in related fields. Study on the clinical consultation process of a prison to understand the actual work flow of the system and come up a solution to overcome the exist problems.

2.3 Project Methodology

Agile model is chosen as the methodology to develop this project. This is the legacy model that commonly used by software projects. It is combined by plenty of iterative process and focus on customer satisfaction. These iterative process is form by breaking the project into small parts which allow the project to be handle differently. Every iterative process, the project will be deliver and present to customer or important stakeholders to increase their adaptability on the project.

There some reason that why this methodology is chosen. According to agile principle, this model allow developer always has a working software to demo it to client. By demo to them, the understanding of client to this project will improve, instead of just reply on the documentation. It supports the client collaboration in which the client may missed mention the requirement during the beginning of project. Hence, this model help developer has continuous interaction with client to has proper requirements of the product. Besides that, the agile development able to ease this project respond to these change of requirements. The following image is the illustration of agile model.

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