SMART PATIENT REGISTRATION KIOSK (SPRK)

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

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
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JUDUL: SMART PATIENT REGISTRATION KIOSK

SESI PENGAJIAN: ___2016/2017_____

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DECLARATION

I hereby declare that this project report entitled

SMART PATIENT REGISTRATION KIOSK

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

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DEDICATION

Dear and mighty god Allah SWT

To Allah who guides us in the dark nights and bad days. Thank to him for blessing me all the way along on my life till the day I am writing this and the day if die.

Dear supervisor

To my dear supervisor who was always helpful and patient, thank you for all the knowledge, guidance and encouragement that help me to finish this project.

Dear Lecturers

To my dear lecturers, thank you for all the knowledge, guidance, patient, care and encouragement. I appreciate your effort in teaching me and I can only ask to bless you with happiness and health in your life.

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ABSTRACT

An integrated Health Information System (i-HIS) is a complete web-based Health Information System which contains a lot of modules to cover all the scopes of the health facilities such as administration module, registration module, consultation module, pharmacy module, laboratory module, ward management module, billing module and other modules. The smart Patient Registration Kiosk (SPRK) is one of the modules from i-HIS which refer to a self-service patient registration system of i-HIS. However, in order to improve the quality and safety of healthcare, few organizations classify the patient registration process as a top priority. Thus, few gaps been identified in the traditional manual method of patient registration such as consumed much time, required a lot of manpower, case crowd and lack of privacy. Nowadays, the web-based applications are being used worldwide to increase the accessibility and availability of services and information. The patient registration could be done in the efficient method by using other devices such as kiosks, mobiles, tablet or computer, especially in hospitals and clinic because of this proposed kiosk considered as best option since it very easy to access and deploy. By having these self-services registration kiosks, the process of registration will be easy, smooth and it will reduce crowding in the patient registration process. Besides that, the SPRK is safe to use because it provides the user authentication while login to the system as user authentication is important because of the medical report is confidential information. Therefore, the patient can view and save their medical report after login to the system without any doubt. The hospital and clinic registration work would focus on the initial task which will improve the hospital and clinic service quality. The system has been developed using JAVA Server Page JSP programming language and Apache Tomcat 8 web server. Moreover, the methodology approached for this system is Prototype Model Software development Lifecycle because is suitable for a dynamic project with the ambiguous or incomplete requirement. As a conclusion, the proposed system gives more benefits for both government and private medical sectors or clinics. This is because of it will improve and ease the patient registration process, reduce manpower, secure information privacy and help registration staff to focus more on important tasks and the quality of Health Information System services can be improved.

ABSTRAK

Sistem Maklumat Kesihatan bersepadu (i-HIS) adalah Sistem Maklumat Kesihatan berasaskan web lengkap yang mengandungi banyak modul untuk merangkumi semua skop kemudahan kesihatan seperti modul pentadbiran, modul pendaftaran, modul perundingan, modul farmasi, modul makmal , Modul pengurusan wad, modul bil dan lain- lain. Kiosk Pendaftaran Pesakit pintar (SPRK) adalah salah satu modul dari i-HIS yang merujuk kepada sistem pendaftaran pesakit layan diri. Walau bagaimanapun, untuk meningkatkan kualiti dan keselamatan penjagaan kesihatan, beberapa organisasi telah mengklasifikasikan proses pendaftaran pesakit sebagai faktor utama. Beberapa kelemahan telah dikenapasti dalam kaedah manual pendaftaran pesakit yang sedia ada seperti mengambil tempoh masa yang lama, memerlukan banyak tenaga kerja, kesesakan dalam kes dan kekurangan privasi. Pada masa kini, aplikasi berasaskan web digunakan di seluruh dunia untuk meningkatkan kebolehcapaian dan ketersediaan perkhidmatan dan maklumat. Pendaftaran pesakit boleh dilakukan secara cekap dengan menggunakan peranti lain seperti kiosk, telefon bimbit, tablet atau komputer terutamanya di hospital dan klinik kerana kiosk yang dicadangkan ini adalah pilihan terbaik, sangat mudah diakses dan digunakan. Dengan memiliki kiosk pendaftaran layan diri ini, proses pendaftaran akan mudah, lancar dan ia akan mengurangkan kesesakan dalam proses pendaftaran pesakit. Selain itu, SPRK selamat digunakan kerana sistem ini menggunakan pengesahan pengguna ketika log masuk. Pengesahan pengguna adalah penting kerana laporan perubatan adalah maklumat sulit. Oleh itu pesakit boleh melihat dan menyimpan laporan perubatan mereka selepas masuk ke sistem tanpa keraguan. Proses pendaftaran di hospital dan klinik memerlukan tumpuan terhadap tugas asas yang akan meningkatkan kualiti hospital dan klinik. Selain itu, sistem ini menggunakan metodologi Kitaran Sikap Pembangunan Perisian Model Prototaip kerana ianya sesuai untuk projek dinamik dengan keperluan yang tidak jelas atau tidak lengkap. Projek ini memberikan lebih banyak faedah untuk kedua-dua sektor perubatan iaitu klinik kerajaan dan swasta. Hal ini kerana, ianya akan meningkatkan dan memudahkan proses pendaftaran pesakit, mengurangkan tenaga kerja, keselamatan privasi maklumat dan membantu kakitangan bahagian pendaftaran untuk lebih fokus kepada tugas yang lebih penting dan kualiti perkhidmatan Sistem Maklumat Kesihatan dapat ditingkatkan.

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CHAPTER I

INTRODUCTION

1.1 Project Background

Smart self-registration service is a web-based or service in most of the time and it built to help the patient to register them self in the hospital or clinic system. The patient can register them self either using the touch screen provided in the hospital or using the mobile phone, iPad or any other device that support web browsing service to connect to the registration web-page. The self-registration would help in minimizing the workhour and speed up the patient registration. Because the registrar takes time to ask the patient their information then types it in the system. Traditional registration at the reception takes between two and ten minutes. At the registration machine, the average registration time is one minute and ten seconds. The quickest customers can do it in five seconds. Moreover, the self-registration system services is common with the huge increasing in the number of educated people that can service them self which reduce the man-power required for registering the coming patient. However, without the need to manually enter data from patient forms into the organization's information systems, overall efficiency also increases, giving staff members more time to devote to patient-related questions and concerns. This enhances an organization's ability to properly educate patients about conditions, medications, treatments, and surgeries - helping to make patients more active participants in their own care. Another issue is the privacy of the patient. The privacy of the user information is very important where the user medical information might be exposed or wrongly used. So, nowadays hospitals and large clinics are start to use the self-registration services.

1.2 Problem Statements

The problems that have been identified in the current system are:

i. Time consuming.

The time required to register patient normally take two to ten minutes depending on how fast is the registrar and how effective is the communication between the registrar and the patient. So, the average of time required to register patient is 6 minutes. If we had ten patients at once that requires one hour for registering them which quite long for a patient to wait. The long time waiting would lead us to the next problem of long queuing.

ii. Long queuing in the reception to register.

In the cases of the large number of patient and the long time required for register the hospital will face the problem of long queues in the receptions points. The long queues have two problems. Firstly, the queue create a crowd that make a problem and take space in the reception area which mostly in the hospital bobby. Secondly and lastly, reduce the number of patient coming to the hospital because of the crowd made.

iii. Shortage in the man-power and equipment.

In the large and medium size hospitals the reception service would require more than two staff, might reach 10 or more. This staff effort could be done by machine which will reduce the cost and safe financial resources. Or the staff could be assigned to other jobs that cannot be done by the machine to have better quality and efficient services for the patient.

iv. Lack on user information privacy.

The information privacy is a critical issue nowadays for the young and new generation. The user information might be hacked and disclosed while the patient tell him/her information to that registrar which expose this information to a miss use either by the registrar or and other third party might be listening.

1.3 Objective

The main objective to developing this system is to improve and upgrade the current system. There are six objectives for this system:

i. Provide online registration.

Providing an accessible system is an important part of the information technology systems' quality. Patient Registration is a public service that required being available in different places for different people. So, developing an online registration system will solve that issue and increase the system accessibility.

ii. Provide personalize registration.

Personalize system is so useful and efficient. The personal-reiteration provides a better privacy on the user information. It also reduces the time required for registration and the man-power required for it. So, kiosks and other workstations allow a patient to check-in to a hospital or clinic instead of going to a front-desk staff member employed by the hospital or clinic.

iii. Maintain the patient demographic information.

This system aim to keep and maintain the data of the patient registered.

1.4 Project Scope

The scope has been defined to develop this project. This system has two scopes which is user scope and system scope. The scope of the system is described inSection 1.4.1 for user scope and Section 1.4.2 for system scope.

1.4.1 User Scope

User scope is the user that will be use the system. There are two types of user which are staffs and patient of the hospital of healthcare facility.

i. Staff

- Have privilege to login system to open it.

ii. Patient

- Have privilege to preform personal-signup to the system.
- Have privilege to preform personal-register to the queue.
- Have privilege to view to the last medical report.

1.4.2 System Scope

System scope is the scope of the modules in the system. There are four modules in the system, which are Login Module, Signup Module, Registration Module and View Medical Report Module.

i. Login Module

This module is for patients/staffs verification where users need to login to use some modules. For patients, they have to login to the system in case they want to view their last medical report. Moreover, for the stuff login is in the beginning of the day to login to open and start the system.

ii. Signup Module

This module is only for patients. It allows patients to sign-up to the healthcare facility system in way to be able to register to the facility queues.

iii. Registration Module

This module allows patients to register to one of the queues in the healthcare facility and print their queue number.

iv. View Medical Report Module

This module allows patient to view and print their last medical report. Moreover, as mentioned above in the login model, this module required the user verification (login).

1.5 Project Significance

The project is very important to the goverment and the medical sector like hospitals and clinics. The system will improve and easy the registration of the patient coming to the hospitals. The system will reduce the man power needed for the reception also will help the reception people to focus on answer the other important or urgent question of patient which definitely help in improving the quality of the patient services. Moreover, the system would ensure better privacy of the patient information where they insert it by themselves. Also, the system will help the hospital in maintaining the patient information to be used later as reference in the next visit or for checking in. The system will be online which provides a high accessibility for the system either through the mobile, tablet, hospital kiosk or through any other device supports web browsing. The higher accessibility help in reducing the pressure and easy the registration process as main objective.

1.6 Expected Output

The project outcome is a online registration system with a friendly and learnable user interface that help patient to register their information online be themselves (Signup). The system also will enable the users to register themselves to the patient queue in the healthcare facility and print their queue number. Moreover, the system will help the user to view andprint their last medical report.

1.7 Conclusion

As the world enters new millennium, many revolutionary changes are takingplace including registration and queuing services. Thus, this system has been proposed to overcome theproblem that occurred in the current system besides to improve healthcare registration services by theadoption of ICT. This system use self-service approach to solve the current system problem.In addition, the objective of this system is to easily user, and it helps healthcare facilities to avoid the long queues, improve the reception performance and shorten the idle time for both doctors and patients what increase the work flow efficiency. Hence, with added features in thissystem, more systematic and effective services can be provided and thus beneficial toboth parties. Nevertheless, this system is useful if both parties take advantage from theadded features using new technology.Chapter II wills covers about literature review and projects methodology.

CHAPTER II

Literature Review and Project Methodology

2.1 **Introduction**

This chapter presents the literature review of smart online registration kiosk. A literature review is an evaluation report that discusses and tests the published studies and existing systems in the same area of smart online registration kiosk. The writing of a Literature review aimed to connect the reader of this report with the knowledge and ideas those have been provided about this topic.

The first section is about Project Literature, which discusses and reviews the existing plications, technologies and systems those are related to the topic of this report. Besides that, it also states the enhanced services that will be used in the smart online registration kiosk application after the comparison with the existing technologies.

In project methodology section, selected techniques and approaches that will be used for the development of smart online registration kiosk application is described. The requirements that are needed in the development process are listed and followed with project schedule and milestones. At the end of this chapter the conclusion part will summarize the whole chapter.

2.2 Facts and findings:

This part of the chapter discusses pervious research done on smart online registration kiosk application project development. The section starts with a basic background about patient online registration systems. The second part of this section will introduce basic knowledge about the patient registration through kiosk.

2.2.1 Waiting Time

Walk in hospital of clinic is always required registration and waiting in order to see the dotor, the focus is on the outpatient who look to see the doctor for consolation. The patient need to go for a long queue. Sometimes the time taken for the patient in order to meet the doctor could drag more than 20 minutes only to walk in the doctor room. It widely experienced by the General Hospital like Hospital Melaka. In the view of small scope helath facility like UTeM Clinic, the major patient is the student and still walk in is needed to register manually. The effect is not too visible but the gap of waiting time still exist.

2.2.2 Early kiosk use

An early example was Healthpoint , a community based touch-screen kiosk developed and evaluated in Glasgow in 1989 according to Jones RB, McLachlan K. HEALTHPOINT (1990). According to Jones RB, Navin LM, Murray KJ. (1993), in the early 1990s, Healthpoint kiosks were sited in supermarkets, shopping centres, community pharmacies, health centres, hospitals, bars, sports centres, post offices, job centres, and libraries, amongst the 23 sites tried. Information provided included both public health and lifestyle topics (smoking, alcohol, sex, drugs, stress) as well as more condition specific information such as prostate cancer. There were few problems in finding locations to site kiosks (Jones RB, Edgerton E, Baxter I, Naven LM, Ritchie J, Bell G., 1993). In 1992 these kiosks were used during five months by seventeen percent of a random population sample. The prevalence of users amongst the over 50s (13%) was not much less than the 20% of users aged under 50. Users were observed in bars using kiosks in groups to access information such as sexually transmitted diseases, smoking, and alcohol use. The most popular topics varied by site but were always public health themes. Medical dictionary and condition specific topics were rarely accessed. Interview data showed a more positive reaction from ‘less educated’ than educated people and was expected because of the style of presentation. In a subsequent 1996 study, nine percent of people who had used a kiosk in one sports centre had apparently obtained no other form of health information in the previous two weeks (Naven L, Jones R, Kohli H, Crawford J., 1996). Various ‘Healthpoints’ for particular

patient groups were also trialled in outpatient areas, for example in radiology (Campbell GM, Jones RB., 1992).

2.2.3 Patient access to records:

The drivers towards giving patients access to their own computer-held medical records have included the desire for more patient involvement in chronic disease management, aims to improve the collection of clinical data through patient interviewing, but also ethical considerations and concerns for patient empowerment. Some U.K. G.P.s, such as Brian Fisher have routinely given patients access to their paper record for two decades (Baldry M, Cheal C., 1986) (Fisher B, Fitton R, 2007). The 'cause' has been helped by the push from legislation and initiatives such as the Copying Letters to Patients. Early studies of computer access included touchscreen access to records in a Glasgow general practice (Jones R, McGhee SM, 1992), and later access to secondary care records in randomised trials in cancer (Jones R, Pearson J, 1999) and schizophrenia (Jones RB, Atkinson JM, 2001) using touch screen booths. More recently, Pyper et al. According to Pyper C, Amery J, Watson M (2004) and Pyper C, Amery J, Watson M (2002), explored patient access to their online records in an Oxfordshire general practice with promising results but the system failed to be adopted as routine practice. In renal medicine, a specialty that has always been at the forefront of clinical computing, patients via Renal Patient View can have access to their records via the web although as yet no major trial has assessed its impact (Boorer L., 2008). Most of these studies have been of opportunistic use or as an 'optional extra' to routine clinical care.

2.2 Project Methodology:

Project methodology helps to manage projects from beginning till the end. It describes each step involved in an orderly fashion with all the details in the development of the project. It organizes the tasks to complete them in a given period of time. In order to develop this project, the methodology used is the prototype model.

The Prototype model is a one of SDLC (Software Development Lifecycle) methodologies, in which the basic model built, is tested, and then re-created, with the desired outcome of the user. It is usually achieved by one of the created prototypes.

The iteration used in this life cycle in prototyping gives the developer an ease of system changing based on user requirements suitable for the system.

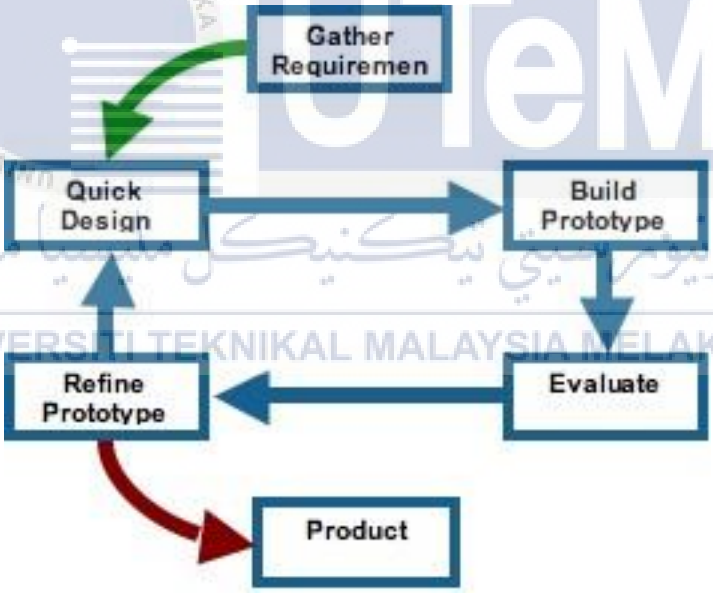

Figure 2.1: Prototype Model SDLC Diagram

Prototyping model

The Prototyping Model is a systems development method (SDM) in which a prototype (an early approximation of a final system or product) is built, tested, and then reworked as necessary until an acceptable prototype is finally achieved from which the complete system or product can now be developed.

Prototyping enables them to see a system, "play" with it and modify it before it is implemented (Lantz, 1986).

Requirements gathering and analysis:

A prototyping model begins with requirements analysis and the requirements of the system are defined in detail. The user is interviewed in order to know the requirements of the system.

Quick design:

A preliminary design is created for the new system, by creating main user interfaces without any substantial coding so that users can get a feel of how the actual system will appear.

Build prototype:

A first prototype of the new system is constructed from the preliminary design. This is usually a scaled-down system, and represents an approximation of the characteristics of the final product;by using system components to illustrate the functions that will be included in the system to bedeveloped.

User evaluation and Refining:

The final system is thoroughly evaluated and tested. This stage considers as a migration for the system from offline world to the online one, during this phase the preparation of the system transfers and migration to the live system will be done. Routine maintenance is carried out on a continuing basis to prevent large-scale failures and to minimize downtime.