UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DESIGN AND DEVELOPMENT OF DESKTOP APPLICATION FOR SASARAN PENTING VISITOR CHECK-IN AND CHECK-OUT MANAGEMENT SYSTEM FOR TELEKOM MALAYSIA, MELAKA

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for Bachelor of Computer Engineering Technology (Computer System) With Honours.

By

MUHAMMAD ALIFF HAIQAL BIN MAHMUD
B071510468
960816055409

FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING TECHNOLOGY

2018

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: DESIGN AND DEVELOPMENT OF DESKTOP APPLICATION FOR SASARAN PENTING VISITOR CHECK-IN AND CHECK-OUT MANAGEMENT SYSTEM FOR TELEKOM MALAYSIA, MELAKA

Sesi Pengajian: 2018

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Alamat Tetap:

No. 30 Lorong 9

Taman Cempedak

13300 Tasek Gelugor

Pulau Pinang.

Tarikh:

Disahkan oleh penyelia:

.....

TS. NORFADZLIA BT MOHD YUSOF

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I hereby, declared this report entitled DESIGN AND DEVELOPMENT OF DESKTOP APPLICATION FOR SASARAN PENTING VISITOR CHECK-IN AND CHECK-OUT MANAGEMENT SYSTEM FOR TELEKOM MALAYSIA, MELAKA is the results of my own research except as cited in references.

Signature: ……

Author : MUHAMMAD ALIFF HAIQAL BIN MAHMUD

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APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Computer Engineering Technology (Computer System) with Honours. The member of the supervisory is as follow:

Signature: …….

Supervisor: TS. NORFADZLIA BT MOHD YUSOF

Signature: …….

Co-supervisor: AIMAN ZAKWAN BIN JIDIN

ABSTRAK

Projek ini direka bentuk sebagai salah satu sub-sistem untuk Sistem Pengurusan Pelawat Sasaran Penting. Tujuan dalam membangunkan projek ini adalah untuk membantu Jabatan Keselamatan Telekom Malaysia Melaka dalam menguruskan pelawat di Kawasan Sasaran Penting Kategori 2 di sekitar Melaka. Projek ini hanya ditekankan kepada dua lokasi Sasaran Penting Telekom Malaysia di sekitar Melaka; Stesen Satelit Bumi di Lendu dan Stesen Kabel Bawah Tanah di Pengkalan Balak. Sistem semasa yang digunakan oleh anggota keselamatan untuk menguruskan pelawat adalah lemah dari segi keselamatan kerana semua maklumat mengenai pelawat hanya direkodkan di atas kertas (Buku pelawat). Pelawat yang datang melawat premis hanya perlu menulis nama dan maklumat lain dalam buku pelawat, tanpa sebarang pengesahan identiti. Selain itu, sebagai tempat yang dianggap salah satu daripada asset negara, pengurusan keselamatan pada pelawat perlu dilakukan secara sistematik dan cekap, justeru projek ini telah disuarakan oleh kakitangan keselamatan untuk memperbaiki sistem pengurusan pelawat mereka. Sistem ini direka berdasarkan keperluan pengguna yang dikumpulkan dari kakitangan keselamatan Telekom Malaysia Melaka ketika mesyuarat yang telah dijalankan. Selain itu, perancangan projek ini dijalankan berdasarkan Waterfall Process Model, dimana semua fasa dalam membangunkan sistem ini dilakukan mengikut fasa-fasa tertentu dan sistematik. Selain itu, berdasarkan masalah yang dikenal pasti dari sistem semasa yang digunakan oleh pelanggan, sistem ini direka dengan baik untuk mengatasi masalah yang berlaku. Langkah-langkah yang terlibat dalam membangunkan sistem ini adalah mengumpul keperluan pengguna, perancangan dan analisis, reka bentuk, pelaksanaan, pengujian, penggunaan dan penyelenggaraan. Fasa awal termasuk mengumpulkan keperluan pengguna, menganalisis dan mencadangkan reka bentuk yang sesuai. Kemudian, sistem ini direka untuk memenuhi semua keperluan yang ditunjukkan oleh pelanggan. Seterusnya, sistem ini akan diguna pakai di pondok pengawal di premis Sasaran Penting. Sistem ini akan memantau daftar

masuk dan keluar pelawat, serta menyemak masa pelawat, dengan pengesahan identiti menggunakan MyKad. Sistem ini akan diuji sebelum dikeluarkan kepada pengguna, dari segi ujian berfungsi dan tidak berfungsi, untuk mengesahkan sama ada sistem itu memenuhi semua keperluan yang dikenal pasti yang disediakan oleh pengguna untuk menjadi sistem yang berfungsi sepenuhnya yang dapat mengatasi masalah yang dihadapi.

ABSTRACT

This project is designed as a subsystem for the Sasaran Penting Visitor Management System. The purpose in developing this project is to assist the Security Department of the Telekom Malaysia Melaka in managing visitors at the 'Kawasan Sasaran Penting Kategori 2' in Melaka region. This project is only emphasised on two of Sasaran Penting locations of Telekom Malaysia in Melaka region which are Earth Satellite Station at Lendu and Submarine Cable Station at Pengkalan Balak. The current system being used by the security personnel to manage the visitors is poor in term of security aspect as all information on the visitors are logged on papers (Guess book). The visitors whom come to visit the premises only have to log their name and other information in the guess book, without any identity authentication. Apart from that, as a place which considered as the national assets, the security management on the visitors should be done systematically and efficiently thus, this project is requested by the security personnel to improve their visitor management system. This system is designed based on the user requirement collected from Telekom Malaysia Melaka's security personnel during meetings that had been conducted. Furthermore, this project planning is conducted based on the Waterfall Software Process Model, where all the phases in developing this system was done accordingly and systematically. In short, based on the problems identified from the current system used by the client, this system is well designed to overcome the problems occurred. The steps involved in developing this system is gathering user requirement, planning and analysis, design, implementation, testing, deployment and maintenance. The early phase includes the user requirement gathering, analysis and proposing a suitable design. Then, the system is designed to meet all the requirements pointed out by the client. Later, the system will be implemented on a desktop in the guard house at the Sasaran Penting premises. The system should monitor the check in and check out time of the visitors, with additional identity authentication using MyKad. The system is first will be tested in term of functional and non-functional testing, to verify whether the system fulfil all

the identified requirement provided by user to be a fully working system which can overcome all the problems.

DEDICATION

I dedicate my dissertation work to my family and friends. A special feeling of gratitude to my loving parents, Madam Zunani Bt Hashim and Sir Mahmud Bin Hassan, whose continually provide their moral, spiritual, emotional, and financial support.

ACKNOWLEDGEMENT

In the Name of Allah, the Most Merciful, the Most Compassionate all praise be to Allah, the Lord of the worlds; and prayers and peace be upon Muhammad His servant and messenger.

First and foremost, I must acknowledge my limitless thanks to Allah, the Ever-Magnificent; the Ever-Thankful, for His help and bless. I am totally sure that this work would have never become truth, without His guidance.

I am grateful to some people, who worked hard with me from the beginning till the completion of the present research particularly my supervisor Madam Norfadzlia Bt Mohd Yusof, who has been always generous during all phases of the research, and I highly appreciate the efforts expended by my co-supervisor, Sir Aiman Zakwan Bin Jidin for guiding me in completing this thesis.

I would like to take this opportunity to say warm thanks to all my beloved friends, especially to Ahmad Hafizi Bin Baharudin, Syarifuddin Bin Sulaiman and Nor Izma Iffah Binti Abdul Aziz whose have been so supportive along the way of doing my thesis.

I also would like to express my wholehearted thanks to my family for their generous support they provided me throughout my entire life and particularly through the process of pursuing my bachelor's degree. Because of their unconditional love and prayers, I have the chance to complete this thesis

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Technological innovation is the main thriving force behind economic growth, industrial development, and the rise of living standards (Petralia *et al.* 2017). These innovations are widely used to adapt with the current rapid development of technologies. In fact, with the swift development of cutting-edge technologies, most of the computer-based system built widely are automated; to fully utilize the available technological components to either improve the productivity of one organization or to fully enhance the security measure of that organization. This includes the development of the automated visitor management system. The visitor management systems have evolved from utilizing manual system to fully automated, either by integrating the system with biometric authentication, smart cards (Hamilton 2011), or sensors (Martella *et al.* 2017) as the additional authentication medium. These adaptations promote the system to be widely implemented in various field; organization buildings, private properties, recreational parks (Pickering *et al.* 2018), restricted areas and educational institutions. The idea to develop an automated visitor management system for the 'Sasaran Penting' locations in Melaka had been issued by the staff of the Security Department of Telekom Malaysia Melaka to facilitate in managing the visitors at the locations. This paper will discuss on the development and implementation of the Sasaran Penting Check-in and Check-out Management System, as a subsystem of the Sasaran Penting Visitor Management System (SPVMS).

1.2 Background

Telekom Malaysia Melaka is one of the branch of Telekom Malaysia Berhad, (TM) that situated in Ayer Keroh, Melaka. The security department of the company is responsible in managing any security issues that circled around the company, including their information system, personnel, and company's assets. Apart from that, they also responsible to oversee the security of 'Sasaran Penting' locations, where most of their valuable and powerful assets are being installed (Yusof 2008) to provide communication infrastructures for the nation. Their tasks also include to monitor visitors that visiting the premises.

It is crucial to maintain and utilize full scale security on the premises as it is stated that if the assets in the premises are facing with destruction or damage, it will result in substantial losses to the economy, national defence and can affect the government's functions and national image (Yusof 2008). Despite the premises in 'Sasaran Penting' are heavily guarded, the government still allow for public visit to certain premises, with several terms and conditions.

The implementation of automated visitor management system had been issued by the Telekom Malaysia Melaka's security personnel to improve their current system being used. Currently, Telekom Malaysia Melaka only implements manual visitor management system, where most of the visitor's data are recorded on papers. Visitors have to apply for a visitation session through e-mail, where sometimes it took long response time for them to approve the application. The check-in and check-out process also are done manually, where the visitors only need to record their name in the guest book. Furthermore, this manual system is very vulnerable, where the premises might be exposed to certain security threats as all the information regarding the visitors are simply recorded on paper.

Visitor management systems are widely implemented to track the usage of a public building or site (Samarath Security Systems 2009). A visitor management system can record the usage of the facilities by specific visitors and provide documentation of visitor's whereabouts by gathering information about the visitors. On the other hand, visitor management system also can help to improve data storing and to facilitate analysis on the visitation records.

1.3 Problem Statement

Currently, TM Melaka are using manual system to manage the visitors at the 'Sasaran Penting' premises. This includes the check-in and check-out processes where visitors only have to write their information in the guest book, with no additional identity verification to enter and leave the premises. This method is not practical considering the place supposed to have a strict security control. The system is very vulnerable, where the premises might be exposed to certain security threats as all the information regarding the visitors are simply recorded on paper and are difficult to be traced. The common scenario issued by the TM Security's personnel is that the visitor might not using his/her real information when entering the premises. It is difficult to verify the visitor's information as there are no proper medium to do so since they only have to sign on a piece of paper. Apart from that, it is difficult to generate reports or visitor records as the data are stored in hardcopy form, where it tends to lose or damage. The TM Melaka's security personnel also pointed out that sometimes it takes too much time to gather the visitor's information from previous years just to generate the report. The data analysis also has to be done manually as the data are stored on paper, hence human errors tend to happen during the analysis process which can lead to false report. However, the main problem stated by the TM security's personnel is that the security measures applied to the current system. As stated previously, the current system used has poor security adaptation in monitoring the visitors entering and leaving the premises.

1.4 Objective

The objectives of the system are to:

1. Develop a desktop application software for visitor's check-in and check-out processes, as the subsystem of the SASARAN PENTING Visitor Management System (SPVMS).
2. Integrate the developed system with 3rd party software and device to enhance security level.
3. Conduct a functional and non-functional testing to verify whether the system fulfil all the identified requirement provided by user

1.5 Scope

This project involves developing a software application that will assist the security guard to monitor and track the visitors at the 'Sasaran Penting' premises, as a subsystem of the 'Sasaran Penting' Visitor Management System (SPVMS). This software application will be installed on the security post's desktop at the 'Sasaran Penting' premises in Melaka region, where it will be used by the premises' security guard personnel for visitors' check in and check out processes. The user interface will be designed as part of the system, where user is able to check in and check out the visitors, view current visitors on the premise and view record of the visitors. The software also will be integrated with a smart card reader to capture visitors' information via their MyKad and compared with the information given by the visitors during the earlier visit application. In other word, this system will limit to only MyKad holder since the hardware used is only able to capture MyKad. Furthermore, it will be designed to display visitors' record which later can be used to generate a proper report.

1.6 Expected Result

This project is proposed to assist the Security Department of Telekom Malaysia Melaka's personnel to manage the visitors whom visiting the 'Sasaran Penting' premises. The proposed desktop application will help the security guards to manage 'Sasaran Penting' visitors' check-in and check-out processes. This application is expected to keep track of visitor's check-in and check-out from the 'Sasaran Penting's buildings, expedite registration process, determine who is still inside the building and notify the system users once the blacklisted/unauthorized user tend to sign in or out from the system. Plus, the system is also expected to facilitate in generating reports on the visitation activities based on the check-in and check-out time logged. Apart from that, this system also may reduce paper usage for the visitation application as all the processes involved are online.

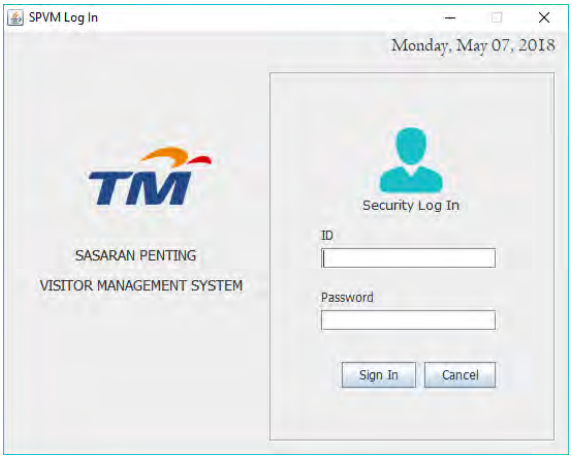

Figure 1.1: Login Page

Figure 1.1 shows the login page of the software. This page shows the interface when user open the software. The security guard on duty will have to login into the system to access the system function. Two fields required to be filled; their ID and password which will be provided by the administrator. Once user click on the login button, the software will navigate user to the next page.

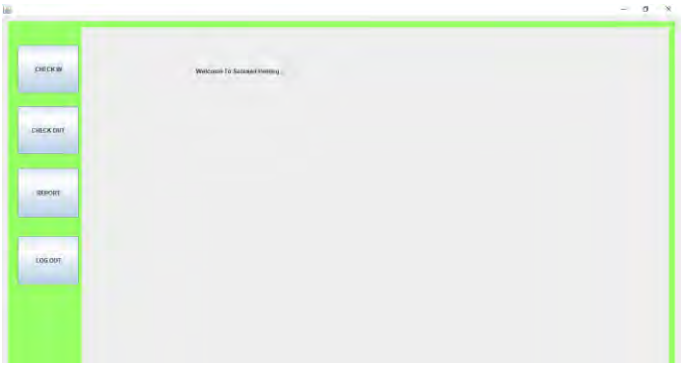

Figure 1.2: Main Page

Figure 1.2 shows prototype of the main page when user successfully logged into the system. This interface contains 5 selectable buttons that navigate user to different functions. The first button, 'CHECK-IN' is to check in the visitor once they arrive at the premise. The 'CHECK-OUT' button is to check out visitor once they finish their visiting session, before leaving the area. 'CHECK-IN RECORD' is to open a new page that will show a record on visiting session. 'OPTIONS' button will navigate user to a page where several settings can be made on the system. The last button, 'LOGOUT' is for user to log out from the system.

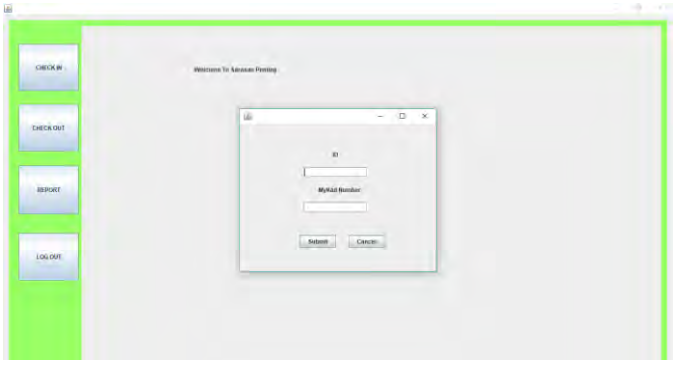

Figure 1.3: Visitor Check in Verification

This page is displayed after user clicked on 'CHECK-IN' button. Here, user has to enter the applicant ID as the ID and MyKad number as the password of the respective visitor for verification purpose. The applicant ID is provided when the visiting application had been approved.