

**STAR LRT GUIDELINE USING
SPEECH RECOGNITION**

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This report is submitted in partial fulfillment of the requirements for the
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DEDICATION

Hereby, I would like to show my dedication to my parents, Dr. Syariffanor binti Hisham (supervisor) and friends who have gives me support and motivated me in accomplish my PSM. Thank you for all throughout the completion of my project.

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ABSTRACT

This project is focused on the technology of speech recognition and method to integrate the application with speech recognition software. Currently there are many websites provide the service of searching of location on map. However, it is lack of interactivity and inconvenient for user to search the specific location through the map. Thus, this project aimed to provide more interactive and convenient way for location searching. This project was developed using the System Development Life Cycle (SDLC) methodology which consists of planning, analysis, design, implementation and maintenance. Besides, hardware and software such as microphone, speaker, mouse, keyboard, workstation, Microsoft Speech Recognition, Microsoft SDK 5.1, Adobe Audition 1.5, Microsoft Visual Studio 2005, Microsoft Access 2007 and Adobe Photoshop CS3 have been chosen to develop the whole application. Furthermore, designs of the application such as architecture design, preliminary design and user interface design have also being sketched in chapter four. Next, the method of implementing and installing the application are being discussed in chapter five. In chapter six, target user for testing such as officer has been chosen in performing the test on application and it is found 80% of the users successfully control the application using speech. Lastly, the observation on strength and weakness of project and it proposition of improvement has been discussed in chapter seven as well as the contribution and overall conclusion of the project.

ABSTRAK

Projek ini meliputi bidang pengecaman pertuturan serta teknik untuk mengaplikasikan pengecaman pertuturan dalam aplikasi yang akan dibangunkan. Di masa kini, terdapat pelbagai laman web yang menawarkan perkhidmatan untuk mencari lokasi dalam peta. Akan tetapi, kaedah interaksi yang disediakan oleh layaran web tersebut kebanyakannya adalah terhad dan membebankan pengguna untuk mendapatkan lokasi yang tepat. Oleh yang demikian, projek ini dibangunkan dengan tujuan untuk menawarkan lebih banyak kaedah interaksi kepada pengguna dan memudahkan proses untuk mencari lokasi dengan lebih tepat. Dari aspek pembangunan, projek ini dibangunkan dengan menggunakan metodologi Kitaran Hayat Pembangunan Sistem yang meliputi proses perancangan, analisis, reka bentuk, implementasi dan sokongan. Di samping itu, perkakasan dan perisian seperti mikrofon, tetikus, papan kekunci, komputer, Microsoft Speech Recognition, Microsoft SDK 5.1, Adobe Audition 1.5, Microsoft Visual Studio 2005, Microsoft Access 2007 dan Adobe Photoshop CS3 akan digunakan untuk membangunkan seluruh aplikasi ini. Selain itu, reka bentuk bagi aplikasi seperti reka bentuk keseluruhan sistem, reka bentuk awal dan antara muka pengguna akan dilukis secara kasar dan diterangkan di dalam bab empat. Kemudian, cara-cara untuk implementasi dan pemasangan aplikasi telah dibincang dalam bab lima. Malahkalah dalam bab enam, perwira telah dipilih sebagai target pengguna aplikasi tersebut dan didapati 80% orang telah berjaya mencapai matlamatnya dengan menggunakan pengecaman pertuturan. Akhirnya, kekuatan dan kelemahan aplikasi telah dikaji sertai ruangan untuk meningkatkan prestasi system, sumbangan projek dan kesimpulan keseluruhan projek telah dibincang dalam bab tujuh.

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LIST OF ABBREVIATIONS

PSM	-	Projek Sarjana Muda
SDLC	-	System Development Life Cycle
LRT	-	Light Rail Transit
SDK	-	Software Development Kit
GUI	-	Graphical User Interface
API	-	Application Program Interface
SRGS	-	Speech Recognition Grammar Specification
SSML	-	Speech Synthesis Markup Language

CHAPTER I

INTRODUCTION

1.1 Project Background

This project focused on the domain of speech recognition technology. Currently, there are many websites provide services to search for the location on map and the transportation that able to travel user to the destination. User can find the route on railway station on the map surrounded with the location nearby station through map. However, it is not convenient and user friendly as in user is required to search for the accurate information themselves through the area of map that as an output of the search. Furthermore, the interactive between user and the system is at minimum. Thus, Star LRT Guideline Using Speech Recognition System that focused on Starline LRT which have been utilize the speech recognition technology will be able to solve problem of lack of interactive of current system as well as provide a more convenient way for user to search for their desired information.

1.2 Problem Statements

Nowadays, as the current LRT information retrieval system LRT does not provide the support for technology of speech recognition and hence it is said to be lack of the choice of interactive. Besides, passenger does not know the specific information about transportation they should take in order to travel from one place to another. Furthermore, it is time consuming for users to queue up to make enquires about transportation information. Lastly, the current system is said to be not disabled-friendly especially for those who have difficulty in writing.

1.3 Objective

- To study on the technology of speech recognition.
- To design and develop an application that uses the technology of speech recognition.
- To enhance the technology of speech recognition on Starline LRT station in order to guide user on the LRT transportation.

1.4 Scope

- Focus on teenagers and those have difficulty in writing.
- Standalone application.
- Limitation on accuracy of voice recognition due to the cloudy environment and different regional accents.
- Limitation in controlling the application as not much people used to command of windows speech recognition software.

1.5 Project Significant

In the end of the project, developer will gain the knowledge in the area of speech recognition technology. Besides, developer will be able to design and build a simple speech recognition application based on the knowledge obtained from the research done in speech recognition. Furthermore, users of Starline LRT will be able to obtain relevant information in order to reach their desired destination. Indirectly, this project boosts up the ticketing counter efficiency of LRT station because it reduces the time of guiding the user when there is a request. Lastly, both users who are able to read and unable to read will benefit from the new system.

1.6 Conclusion

This project highlights utilization of the technology of speech recognition. This new system provides effective guidance to Starline LRT users as well as increases the efficiency of Starline LRT station's operation. In the next chapter, some literature reviews such as comparison of existing system, comparison of programming language, methodology, instructional design, software specification and hardware specification are discussed to assist the development of Starline LRT guidance system.

CHAPTER II

LITERATURE REVIEW & PROJECT METHODOLOGY

2.1 Introduction

In this chapter, the domain of the project will be identified as well as study on existing system that has similarity with this project. By gone through this process, the project able to refine from the disadvantages of existing system and make the developing system more effective and attractive. Next, software and hardware technology that will be used are to be determine in order to improve the efficiency of the system.

2.2 Domain

According to Wikipedia and proven by few articles, the first speech recognizer appeared in 1952 and consisted of a device for the recognition of single spoken digits. Although the technology has been developed for some decades, it is not widely utilized in Malaysia. Thus, the domain of this project is to introduce the utilization of the speech recognition technology in providing guidance for Starline LRT user in Malaysia.

2.2.1 Speech Recognition

Speech recognition can be categorized into speaker dependent and speaker independent. For speaker independent speech recognition, the speech recognition software will not rely on the voice of user who speaks so that everybody can interact with the system with the same rate of accuracy. On the other hand, speaker dependent will recognize the voice of the specific user to make the system work more accurately.

The advantage of using speaker independent software is the software provides vast vocabulary that can be use for dictation. However, users are required to train their voice into a standard accent in order to allow the software to provide a more accurate output. In contrast, the speaker dependent software does not consist of large numbers of vocabulary provided. However, it is suitable to use on application that require much specific word such as telephony, call center and so on.

In conjunction with the development of application, it enhances the use of speech recognition technology. Grammar is required to recognize the specific word that will be used for the application which does not available in the speech recognition software. For example, the word *Pudu Raya* needed to store inside the grammar file in order to enable the use of word inside the application.

Similarly with grammar, vocabulary is also needed to allow the speech recognition to identify word that is not being stored inside the speech recognition engine. Unfortunately, the word that is being saved as vocabulary does not enable the feature of word reservation for event-handling.

In conclusion, developers who wish to implement the technology of speech recognition on the application are required to choose the type of speech recognition software that is being use as well as identify the grammar and vocabulary being used in the application.

2.3 Existing System

Currently, there are a few websites that provide user information of the route of LRT which are Google Map, streetdirectory.com, maps.701panduan.com and etc. Those examples provided above are time-consuming as it requires users to search for it on the map manually.

2.3.1 Comparison of Existing System

In this section, analysis for several existing resources that provide the service for checking the nearby Starline LRT station for desired destination will be selected to perform comparison. The 3 existing application selected to perform comparison are generally web-based application which are Google Map, streetdirectory.com and maps.701panduan.com. The table below is the summary for the services provided by the application.

Table 2.1 : Comparison of Existing Services

Existing Service	Google Map	Streetdirectory.com	Maps.701panduan.com
Service	Search location on map, search for the path to the destination, search the time duration from one place to another according to method of transportation, view satellite map	Search location on the map, provide path of driving from one place to another	Search spot of tourist
Purpose	Provide location, direction and duration to the destination	Provide location and direction to the destination	Provide spot of tourist
Method of searching	Destination address, street name, company name, drag on map	Drag on map, street name, company name	Company name
Degree of zoom	18	Ten	Seven
Satellite Map	Yes. Provided with the freedom of zooming at certain degree	Yes. Without functionality of zooming	None
Coverage of Map	World-wide	Singapore and Malaysia only	Malaysia only
Information on Transportation	Yes	Yes	No