

PDA UNIVERSAL TIME SYNCHRONIZATION USING GPS RECEIVER

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN
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BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek: PDA UNIVERSAL TIME SYNCHRONIZATION USING GPS RECEIVER

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ABSTRACT

Everyone in this world needs to know the precise local time at their country or at the place where they are, whether they are in their country or other countries around the world. The Personal Digital Assistance (PDA) will operate as a universal time synchronizer where it will synchronize and display the precise time of a location where the user is at the moment. The aim of this project is to develop a system that be able to synchronize the local time at specific area based on data that received by the Global Positioning System (GPS) receiver. This project is developed by using Visual Studio.NET programming. Beside that, GUI-based software is used to determine the local time when the user travel to other country and the system automatically performs the synchronization process. Universal Time (UT) will take into the consideration during this time synchronization process. There are 25 integer World Time Zones from -12 through 0 (GMT) to +12 where each zone is 15° of Longitude referred to East and West from the Prime Meridian at Greenwich, England. This system has been proposed to overcome the problem to improve the universal time synchronization where this system might be implemented to all PDA users in future. So, this developed system will be used by all PDA users around the world where to display the current location and the precise current local time.

ABSTRAK

Semua orang di dunia ini perlu mengetahui waktu tempatan yang tepat di Negara mereka sendiri atau juga ketika berada di Negara lain. Personal Digital Assistance (PDA) ini akan bertindak untuk menyeragamkan waktu tempatan, dimana PDA ini akan menyeragam dan mempamerkan waktu tempatan yang tepat di sesuatu lokasi di mana pengguna berada pada ketika itu. Matlamat projek ini adalah untuk membangunkan suatu sistem yang mampu menyeragamkan waktu tempatan di sesuatu kawasan yang tertentu berlandaskan data yang diterima oleh Global Positioning System (GPS). Projek ini dibangunkan dengan menggunakan perisian Visual Studio.Net dan selain daripada itu, ia dibangunkan dengan perisian berasaskan GUI bagi mengenal pasti proses keseragaman waktu. Semasa belaku proses pemyeragaman ini, Universal Time (UT) akan diambil kira untuk membuat pengiraan waktu tempatan. Terdapat 25 integer zon waktu dunia iaitu dimana -12 menerusi 0 (GMT) kepada +12. Setiap satu zon dipisahkan sejauh 15^0 longitud sama ada ke arah Timur atau ke Barat daripada kedudukan Prime Meridian di Greenwich, England. Sistem ini dicadangkan supaya dapat mengatasi masalah mengenalpasti waktu tempatan, di mana system ini akan diperkenalkan kepada semua pengguna PDA pada masa akan datang. Oleh itu, system yang dibangunkan ini akan digunakan oleh semua pengguna PDA di seluruh dunia sebagai salah satu aplikasi untuk penentuan waktu tempatan.

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LIST OF ABBREVIATION

AD	-	Atmospheric Diversion
CPU	-	Central Processing Unit
GUI	-	Graphic User Interface
GPS	-	Global Positioning System
GMT	-	Greenwich Mean Time
HD	-	Half Diameter
ISS	-	International Space Station
IM	-	Instant Message
LCD	-	Liquid Crystal Display
LAN	-	Local Area Network
LEO	-	Low Earth Orbit
LWH	-	Local West Horizon
LEH	-	Local East Horizon
NET	-	Networking
PDA	-	Personal Digital Assistance
PC	-	Personal Computer
RAM	-	Random Access Memory
ROM	-	Read Only Memory
SGP	-	Satellite Geostationary Perturbation
SV	-	Signal Vehicle
TLE	-	Two Line Element
UT	-	Universal Time
UHF	-	Ultra High Frequency
VB	-	Visual Basic

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CHAPTER I

INTRODUCTION

This chapter will discuss about project background mainly to synopsis of the project, objective and scope project, problem statement and report structures.

1.0 PROJECT BACKGROUND

The PDA will operate as universal time synchronization device where it will synchronize and display the precise time at the location where the user is at the time. The aim of this project is to develop a system that is able to synchronize the local time at specific area based on data that received by the GPS receiver. This project is developed by using Visual Studio.NET programming. The GPS receivers convert SV signals into position, velocity, and time estimates. GPS satellites circle the earth twice a day in a very precise orbit and transmit signal information to earth. GPS receivers take this information and use triangulation to calculate the user's exact location.

The GPS receiver compares the time signal was transmitted by a satellite with the time it was received. The time differences show the GPS receiver the distance of the satellite and as well as show the user's exact location. Now, with distance measurements from a few more satellites, the receiver can determine the user's 3D location in term of latitude, longitude and altitude. In order to calculate the

local time at the specific area or location, these data will take into the consideration. Universal Time (UT) is also take into the consideration during this time synchronization process. There are 25 integer World Time Zones from -12 through 0 (GMT) to +12. Each one zone is 15° of Longitude as measured East and West from the Prime Meridian of the World at Greenwich, England.

1.1 OBJECTIVES AND SCOPE OF PROJECT

The following term is discussed about the main objective and the scope of the project.

1.1.1 Objective Project

This project is carried out with the following objectives:

1. To study about GPS receiver, Visual Studio.NET Programming, and time Synchronization concepts.
2. To study and understand PDA's functions and PDA's programming which is must be familiarized with the basic knowledge of PDA before applying and programming in PDA.
3. To learn about PDA program that handheld computing device used to process, store and access data.
4. To synchronize the precise local time at the point where the user prefers as well as to determine the local time at all areas around the world.
5. As one of the application on the flight where the PDA can use to continuously synchronize and view the local time that varied at each point.

1.1.2 Scope of Work

The scope for this project is as stated as below:-

- I. Developing Software for PDA programming by using VB.net that can determine the local time at each specific point around the world.

This system will be implemented especially to the PDA user in order to fulfill their requirements that need to search for local time synchronization as well as their exactly location. The focus of this system will be on universal time (UT) synchronization by using the GPS receiver where the scopes are as below:-

- User Access with System
Have a privilege on this system to synchronize the local time and save the synchronization results and also to run the time that was synchronized.
- Selecting Function
The user can easily make a selection by just expanding item lists in order to do the synchronization of local time.
- Automatic Synchronization
The user can easily select this function to synchronize the local time based on GPS receiver data.
- Manual Searching Function
Simple search, where the user can make searching for the local time information as well as their location.
- Help Menu
The user can find for the help information by click this menu.

- II. Hardware – Personal Digital Assistant (PDA) in implementing developed software.

1.2 PROBLEM STATEMENT

The aim of this system is to provide an efficient system and solve existing problem. The problems identified are:

- Normally the person who frequently travel to oversea or other country face the problem with local time synchronization where they have to manually adjust the time according to the local time at that area. By using this system, the user can automatically view the precise local time that will be displayed on PDA.
- Normally flight operation used GPS clock system where the time schedule for the flight operation depends on this GPS clock system. So, the problem that normally people face is to know the precise time for transportation reason such as for flight. By using this time synchronization system, the user can view the precise time on PDA.
- Normally the problem that faced by the flight user is to know the local time at their specific location while traveling on flight. This system can be implemented specially for the flight user where the user can view the local time at their specific location when they are on flight. By using this system, the user also could know their exact location by view it on the PDA.

1.3 METHODOLOGY

The methodology of this project will be based on the following flow chart

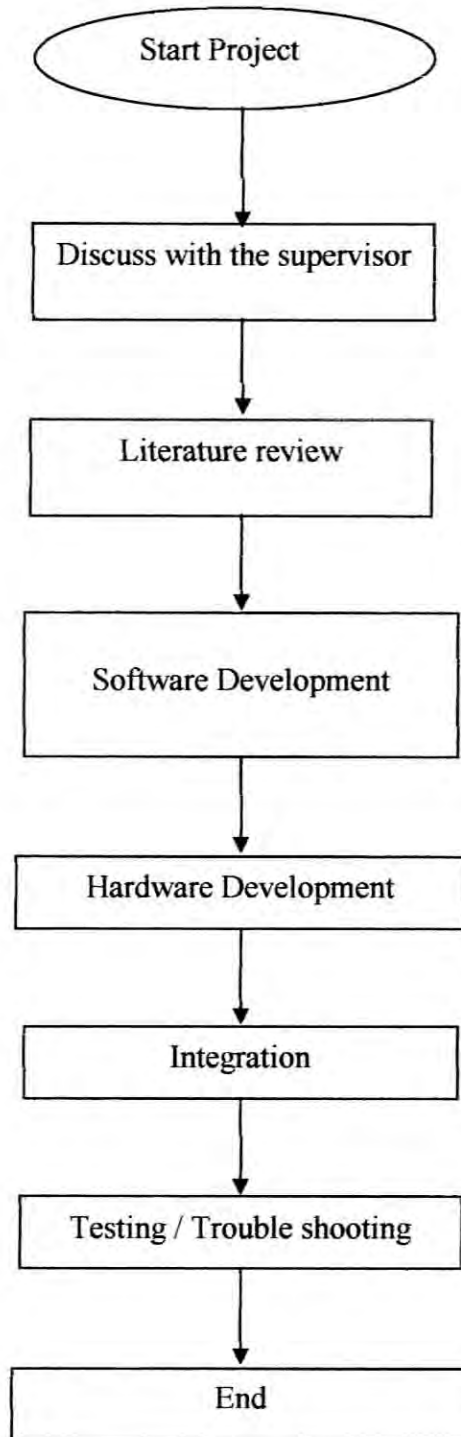


Figure 1.1: Project Methodology