Development of A Smart Parcel Box Using a RFID system and GSM modem interface with a mircocontroller

Contents

Introduction

- Normally in Malaysia, for a delivery we will use trusted courier company or delivery services such as Pos Malaysia, GDExpress, DHL, Nationwide Express and etc.
- The process of delivering, where the postman will send the packages to your house directly. For a certain delivery, the postman will drop it in the parcelbox.
- This project is an improvement for a parcelbox by using the RFID technology. We will use the SMS through a GSM network to acknowledge the user regarding their packages.
- The uses of RFID and GSM technology in this project are to help the user to have flexible and user friendly parcelbox system at their house.

Literature Review

RFID system

- RFID – Radio Frequency Identification : a system of automatic identification, tracking and data collection that used radio frequency transmission.
- Operate in three main range of frequency which are low frequency(LF), high frequency(HF) and ultrahigh frequency(UHF).
- Frequency range only affects the system's speed, accuracy and range but not how the components operate.

RFID Frequency Range

Frequency Range	Common RFID Band	Read Range	Applications
Low Frequency	125kHz-134kHz	Below 0.5 meters	Animal tracking, access control, vehicle immobilizers, product authorization
High Frequency	13.56MHz	Below 1 meters	Item tracking, airline baggage, smart cards, libraries
Ultrahigh Frequency	860MHz-930MHz	3 meters	Automated toll collections, parking lot access

RFID reader

- known as interrogator/ transceiver
- To activate RFID tag, received information from the tag and transmit the information to the database.

RFID tag

- Known as transponder
- A device that automatically transmit when it receives a signal
- It is used to transmit and receive signal from RFID reader using radio waves

GSM modem

- GSM : Global System for Mobile Communications
- A wireless modem that works with GSM wireless network
- Uses radio waves interface to send and receive data
- Needed SIM(Subscriber Identity Module) card in order to function.
- To control the function of GSM modem, AT command is used.

- AT commands will allow the GSM modem to perform various command such as:

i. Read,write and delete SMS
ii. Send SMS
iii. Monitor the signal strength
iv. Monitor the charging status and charge level of the battery
v. Check on the credit balance

Short Messaging Service (SMS)

- A communication protocol that enables the sending and receiving text message between mobile phones through GSM network.

Problem Statement

- In Malaysia, people got problems with big parcels or big package delivery
- Basically, the packages are send directly to their home(trusted courier).
- Problem occurs when the owner not available when the postman deliver the packages at home.
- Leave notes/ phone calls : inform the owner to pick the packages at post office/main office.

GSM modem

RFID reader IDR-232

PIC microcontroller

Objectives

- The objective for this project is to develop a smart parcel box using RFID system and GSM system that interface with a microcontroller.

Methodology

Literature Review on RFID system, GSM modem and microcontroller

Study on the equipments(hardware)

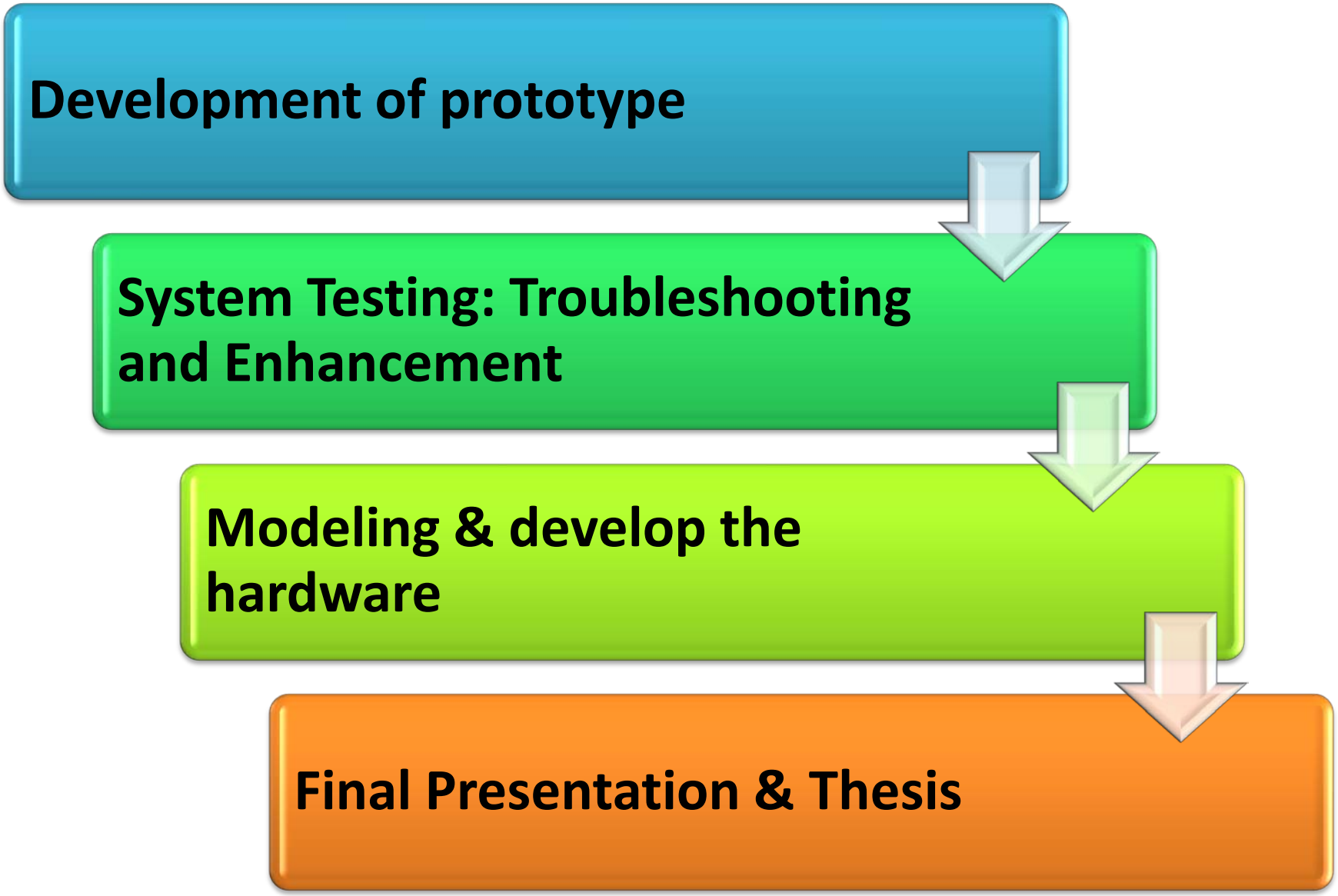
Study on software that were used- Micro-C Pro

Study on LED blinking, LCD display and button (push button) : Designing the system and programming using Micro-C Pro

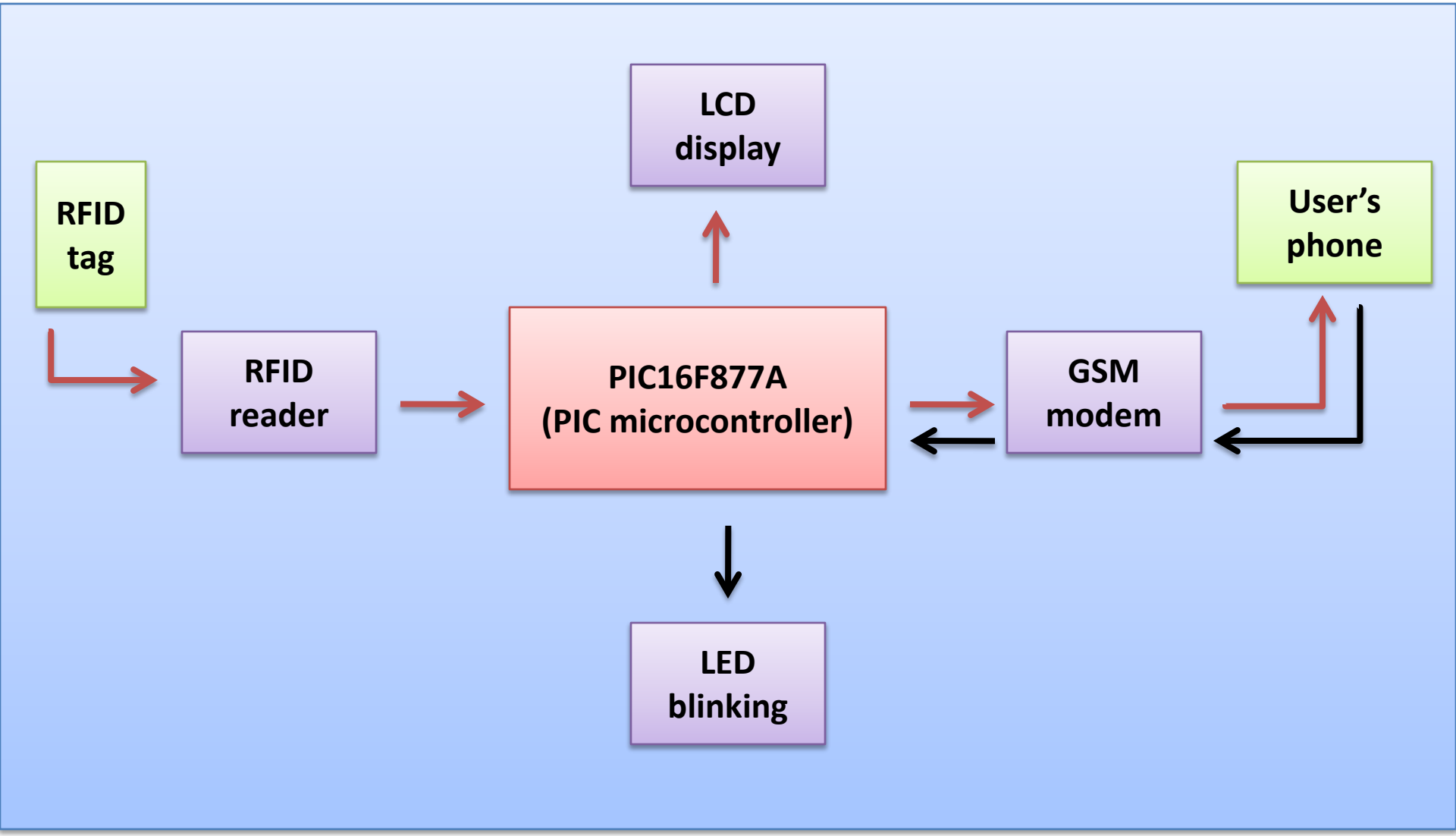
Designing and programming to interface RFID system with PIC microcontroller

Designing and programming interface GSM modem with PIC microcontroller

Simulation stage


Development of prototype
System Testing: Troubleshooting and Enhancement
Modeling & develop the hardware
Final Presentation & Thesis

Project Block Diagram



Expected Results

- To come out with a smart parcel box using RFID system and GSM system interfaced with PIC microcontroller.