BLIND STICK NAVIGATOR

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Report Submitted in Fulfillment of the Requirements
For the Bachelor of Networking System (Hons)
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MAY 2015

DECLARATION PAGE

I declare that this report is my original work and all references have been cited adequately as required by the University.

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APPROVAL PAGE

I have supervised and examined this report and verify that it meets the program and University's requirement for the Bachelor of Networking System (Hons).

Date: 19/05/2015

Signature : ……

Supervisor's Name : MRS. DIYANA BT AB KADIR

Official Stamp

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Last but not least, I would like to thanks to all my friends who has motivated and inspired me towards the completion of this report. Similarly, I would like to thanks to my dear friends from mechanical course student for extremely helpful suggestions in thesis correction both linguistically and conceptually before submission.

ABSTRACT

This study was designed to meet the needs of my Final Year Project before the end of study in UniKL MIIT in November 2016. This study aims to test students' understanding of the subjects studied during the period of their studies at UniKL MIIT. Students of Bachelor of Networking System (Hons) are required to develop projects that relate to their field of study such as web, interactive applications and others that is appropriate. Therefore, I have chosen to develop "Blind Stick Navigator" as my Final Year Project. "Blind Stick Navigator" is blind assist tool that are basically came out from traditional white cane and upgraded into current technology. It's an enhancement from the previous project for blind people in order to help them to get assist during their journey. This new method of implementing current technology component likes 1Sheeld will helps least the difficulties of the blind people community in achieving better response feedback of their surrounding.

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LIST OF ABBREVIATION

Final Year Project	FYP
Malaysian Institute of Information Technology	MIIT
Universiti Kuala Lumpur	UniKL

CHAPTER 1: INTRODUCTION

1.1 Background

This project is called as Blind Stick Navigator. It is a prototype of an upgraded sensor device with two main features for the blind people. Firstly, it's for detecting obstacles and measures the distance ahead. The uses of ultrasonic sensor thus help to identify the things and vibration motor to translate the sensor before adding vibration pressure to the wrist. The handle of the stick is cover with soft pad that equip with vibration motor in order to direct trigger the user senses on upcoming obstacles through their hands. Secondly, it will have a mini GPS (Global Positioning System) to receive and pinpoint the blind user (longitude/latitude). Besides that, it will send emergency notification via SMS to their guardian or authority whenever there are in needs. It's designed to assist and navigate them. In addition, it will help them on getting clear observation on complexity area like streets and etc.

1.2 Problem Statement

Nowadays, disabilities people keep increasing and the high demands of technology devices that can assist human being. Based on World Health Organization (WHO) statement in 2014 [1], about 285 million people are estimated to be visually impaired worldwide and 39 million are blind and 246 million have low vision. Thus, about 90 % of the world's visually impaired live in low-income settings. While, 82% people living with blindness are aged 50 and above. Due to massive development in city thus affect blind people to use their hearing and touching senses well.

White cane or also known as Hoover cane [1] provides mobility tools to assist blind people. Based on previous problem that I have studied shown that the invention of glove with ultrasonic sensor is actually suitable in indoor environment but it may become uncomfortable and not suitable when in outdoor environment. This is because of the bad perception of people seeing them keep raising up their hand and wandering what is ahead of them. They need to take a lot of time on handling and removing the glove completely. Traditional white cane [2] is actually like their best buddy and by upgrading a bit on their cane thus helps their senses to focus and synchronize well with it. Technology can become good or bad invention to the people. For example, there are electronic long cane in the market like UltraCane [10] that cost about RM3407.96 (£635.00) each. The price is quite high for a middle-class citizen. It can detect obstacles at ground and head level but lack of features like GPS locater. There are also another blind assist tool like pedestrian navigation system [3] that design is a bit bulky and have good navigation system that guide the user from current to target destination. The effect from that design is too much wiring covers to the body of the users that can cause short circuit. After that, in year 2014, a good inventor from Egypt created 1Sheeld [11] microcontroller board to synch well with main Arduino Uno along with Bluetooth features. Thus, we can take advantage from 1Sheeld microcontroller invention to create a good blind assist tool without affecting the health of the user.

In addition, based on the previous articles, invention and ideas for the blind people had made me to come out with an idea on using traditional white cane combine with obstacles sensor and GPS tracker. Thus, a great innovation can helps blind people and community future research.

1.3 Problem Objective

The main objective is to solve the problem statement above by building a prototype of a Blind Stick Navigator for the blind and visually impaired people that become an assistive technology which can detect obstacles and getting information on their location through GPS (Global Positioning System) [4]. In order to help them on getting done with their daily routines without any problem, the build on obstacles sensor need to have latest microcontroller board. Arduino Uno is the old sub-board of main microcontroller Arduino. By using 1Sheeld board thus helps the circuit and program to give the feedback on obstacles and provide notification through vibration on the handle of the cane. Besides that, using 1Sheeld capabilities on connecting Arduino Uno board using Bluetooth and by taking advantage from smartphone that already built in with the GPS system.

Thus, we can cut cost to this invention and can helps other researcher to proceed with this prototype for future research. The open source code that been provided in this system thus helps other to get benefit from this project.

1.4 Scope of Project

The project concentrates on sensor, notification and system that compatible to the devices and users need. This ultrasonic sensor (HC-SR04) [5] will provide obstacle sensor at 2cm-500cm and automatically sends eight of 40 kHz signal to detect pulse of the current situation and signal back to user. If using a long range sensor like 2 metres, we need to add more budget to covers the high quality sensors.

The types of environment that need to test for this project is very important because we can ensure whether it may give interference to the user or the sensor to work well. Plus with, the health of the user may affect if uses too much power signal in it. Moreover, the sensor capabilities need to observe whether it could detect obstacles in rainy or windy weather. Besides that, the complexity of having many features in one devices can leads to an issue whether the weight of white cane affected. The vibration motor needs to provide vibration when detecting obstacles. The vibration process needs to get good feedback from the sensor. After that, it will sends back the results at the handle of the stick. Besides that, the circuit need to be covered with case in order to prevent any short circuit occur. We need to make sure whether this GPS able to locate the blind people correctly in different kind of geographical area and indoor spaces.

Furthermore, this blind stick can be an assistant for academic purposes like teachers in special school. They can teach the blind kids to use well their white cane while monitoring them through GPS. Besides that, the GPS must able to send SMS to their top 5 contact list and authority in case of emergency issue like in missing or doesn't know who to get help from. Besides, the negative stigma from Blind and Visually Impaired Organization about this stick needs to be change. We must help them to understand in order they able to adapt well to the current technology. Hence, the device must be in safety measure and provides notification without conflicting their main senses and makes it comfortable to be use in indoor and outdoor environment.

1.5 Project Limitation

The process of achieving complete and perfect devices reflect to the scope of this project whether it is not costly and friendly use or not. After look into the requirement and things that need to be done to this project, I can conclude that this project have several limitation that can't be fix or change until there is enough budget or new technology created. First of all, the ability for the Blind Stick Navigator to work in rainy weather and low-power cellular base-station signal like in basement and etc.

Besides that, this 1Sheeld apps use touch screen on the smartphone thus blind people need to get extra assistant from community like authority, their guardian or people nearby in case of the smartphone in error state. Mobile credit data needs to be in sufficient balance in order to send the SMS notification to the smartphone. Moreover, the board need power source from battery or power adapter. It needs to be charges once they heavily used. Furthermore, the limitation of not having voice guidance like Google Voice or Siri that synchronize with 1Sheeld apps affect the issue of this user friendly device.

In addition, if Braille smartphone invented in future, I hope it can synchronize well with Blind Stick Navigator. Plus, it may help other researcher to study and enhance the devices for greater goods and adaptable to any situation that user experience through.

1.6 Summary

The expected outcome for this project is that the Blind Stick Navigator able to work friendly well for blind and visually impaired people. Besides, the ability to provide a good assistant to them without any complicated issues. By defining this project well on the background, statement, objectives, scope and limitation project in proper structure without letting out any highlighted issue. In addition, electronic devices is known as complex things to the human being. We as a user can make it better and positive to their life by following the requirement needs and purposes.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Background of the project explained in this chapter based on the previous research on same topic and mechanical writings. It was discuss and compare to each other in order to get an overview understanding of this project really means.

Based on source from Country Report Malaysia, numbers of people with disabilities that registered with the Social Welfare Department (JKM) are about 280 thousand people which are 12 percent of the estimated population of the disable in our country. The total number of this statistic doesn't reflect to the real situation of disable people in Malaysia but most important thing is the disabled people that ignored by the government and society.

Thus, this project come out on aiming a blind stick that is useful for blind people to navigate and inform themselves while walking through obstacles and helps others to know their location for emergency purposes.

2.2 Functionality

The development of this enhance navigator system will contain following activities in order to give the best result and affordable system for blind people.

Basically, it's an aid for blind and visually impaired people. Whenever they approaching nearest obstacle the microcontroller will send information to the user about which walking routes to point and decisions to make. It will reduce the difficulties for the blind man to know their current localization by informing them via ultrasound sensor and vibrator at the handle of the stick. By providing GPS tracker system thus adding up the security for blind people to send their location to nearest contact and the authority that involved with.

This stick is placed with microcontroller and ultrasonic sensor HC-SR04 [5] that can detect object or obstacles in front. Using extra HC-SR04 onto the board to cover the issue on detecting head and ground level. While, the vibration motor will be place near to the handle of the white cane and well wrap with smooth cloth. When nearest obstacles detected by ultrasonic sensor, it will send feedback to the board and trigger the DC motor to vibrate at the handle.

The GPS system [4] is actually starts from smartphone that get input from the Arduino Uno that combine with [11] 1Sheeld microcontroller board. 1Sheeld act as wireless middle-man for the Arduino board physically connected to smartphone user via Bluetooth. Why using 1Sheeld? From previous project, shown that by using Arduino Uno as standalone thus affecting the cost and takes lots of time to configure with. Arduino board need to have extra wiring and electronic process into it. The cost of each GPS device at the market for Arduino board is very high and only focus on certain function. While, using 1Sheeld thus provide faster and cheaper ways of prototyping this project. Less wired was used compared to old method that apply in Arduino Uno board. We can compare the GPS cost if not using 1sheeld board is about 200 dollar or more. For about less than 50 dollar we can get the 1sheeld board and cut extra cost needed and can provide extra function for this projects. 1Sheeld connect smartphone through Bluetooth and provide function like LED, Toggle Button, Buzzer, Slider, LCD, 7-Segment, Keypad, Music Player, Game Pad, Notifications, Twitter, Facebook, Foursquare, Gyroscope, SMS, Flashlight, Mic and etc.

Thus, by taking advantages that already built in the smartphone will helps us to configure the GPS system to our microcontroller and not strictly function to detect obstacles but much more thing we can do with it. 1Sheeld uses a standard HC-06 Bluetooth adapter (Bluetooth 2.1) that range up to 30 feet and communicates with Arduino using UART (Serial) for the serial port. In 1Sheeld, the function of GPS Shield to allow Arduino board to read GPS library code in order to get location data from smartphone GPS and take action on what to do with that data. Thus, the ability

to get the latitude and the longitude in degrees of the user location is possible with this features.

Moreover, GSM Shield library will enables Arduino board to operate user smartphone [6] to get features like sending and receiving SMS, connect to the internet over a GPRS network or can place and receive voice calls. Combining the GPS and GSM Shield library code helps the possibility to provide location of the user along the function to send notification to the target user. In addition, this function will helps to simplify the complexity of this prototype and provide the best and convenient solution for the blind and visually impaired people at lower cost.

2.3 Overview Similar Project

2.3.1 BlueCane

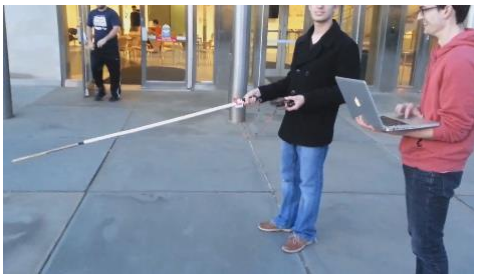


Figure 2.1: BlueCane

Bluecane [7] is a prototype of a navigational device for blind user that enables them to receive route-guided instructions via Bluetooth and cardinal directions using haptic feedback. Bluecane has two main component the Arduino slave code and processing master code. It is developed by Jacob Simon and his 17 member in his group.

The system initializes the accelerometer, magnetometer and Bluetooth components in the setup. It works through looping of process getting readings from the accelerometer and magnetometer, then it calculate a tilt-compensated heading

and Bluetooth mode will vibrate only heading desired direction and Compass mode will vibrate only heading north.

The project was initially submitted to the Princeton University but have an issue with the Arduino that configured by them and get less feedback because of not having the control vibration and proximity sensor.

2.3.2 Handsight: A Glove for the Blind to Feel Shapes and Navigate Obstacles.

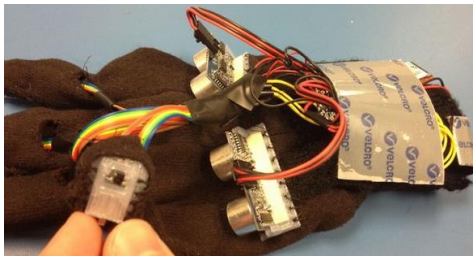


Figure 2.2: Handsight glove

Handsight [8] is a prototype glove to aid the blind and able to sense lightness or darkness of a surface with tactile feedback from vibration motor for each individual finger. It can also sense distance from physical objects or obstructions and distance with the same vibration feedback. The glove can connect over Bluetooth to switch modes and visualize sensor readings.

Modes on shape detection is used to feel out the edges of the object and device will vibrate whenever sensor in crossed a threshold and an edge detection mode. The upper threshold for this detection prevents the glove from produce vibrate while in midair while lower threshold is between black and white. Modes on texture detection allow the user to feel variations in the texture of an image. While the modes on navigation is between four infrared reflectance sensors at the fingertips. This two wrist-mounted ultrasonic range finders simulate the user cane to detect surfaces or

obstacles and the frequent sweep back and forth without having problem. But this glove not suitable on beyond flat surfaces means that less reliable further from 90 degrees of users. Besides, the lack of effectiveness while detecting material with cloth or heavily textured surfaces and resulting to fail in extraordinarily noisy sound setting.

This work was made as part of the final project requirement in the "Tangible Interactive Computing" for University of Maryland, College Park.

2.3.3 Hand-Mounted Sonar Assist for the Blind

Figure 2.3: HMS sensor motor

Hand-Mounted Sonar Assist for the Blind [9] is a prototype that using haptic feedback on the wrist of the user and can measures distance to things and translates that into vibration and pressure on the user wrist.

The wrist mounted and senses objects from about 1cm to 80cm and get fast response time. The ultrasonic sensor (HC-SR04) is used to focus on detecting obstacles and servo motor for movement of the glove without giving problem at board on reading the input data. Main microcontroller been used in this project is Arduino Pro mini. The result of this project is the ability to provide notification to the user when they wandering their hand glove in midair to sense obstacles ahead. Plus getting on constant vibration in fast mode when nearer to obstacles and slow mode when far from the obstacles.

This project was made by Diploma of Engineering Technology in Medical Electronic in Dec 2014 as a requirement of final year project subject for Universiti Kuala Lumpur British Malaysian Institute (UniKL BMI).

2.3.4 UltraCane

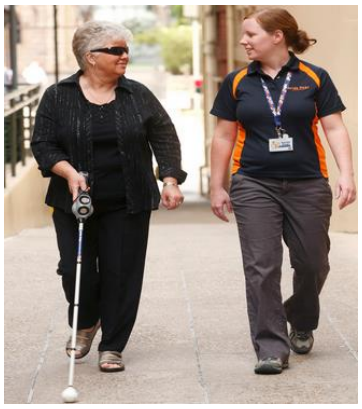


Figure 2.4: UltraCane

UltraCane [10] is an electronic mobility aid that enhanced from traditional white cane in giving mobility assistance to blind and partially-sighted people by detecting potential obstacles while still several feet from them. It is equipped with a dual-range narrow beam ultrasound system that works like echolocation system used by bats and dolphins. The ultrasonic waves are emitted two transducers on the handle of UltraCane and bound off objects and obstacles in the path of the users.

Moreover, UltraCane has two ranges of detection and it sends out ultrasonic waves that ranges between 4 metres to the front of the user and short range at 2 metres to the front of the user. If there is object on the ground in front of the user, it will register lower tactile button that means when moving closer to the target the frequency of the vibration will automatically increase and can sweep the cane from side to side to determine best way to move around the object. While top tactile button will function to inform user that they are approaching objects that between hip and head level and can physically locate the object with hand.

This cane use AA batteries as standard batteries and it is quite difficult for the blind people to keep changing the batteries when runs out. Besides that, the prices of this cane is about RM3407.96 (£635.00). Good technology but lack of power source and very costly for low cost budget citizen especially for blind people.

2.4 Comparison Project

Table 2.1: Similar Project Overview

Project	Micro-controller (Arduino)	Input Interface (GUI)	Navigation	Obstacles Sensor	Vibration
BlueCane	✓	X	✓	X	✓
Handsight	✓	X	X	✓	✓
Hand-Mounted Sonar Assist for the Blind	✓	X	X	✓	✓
UltraCane	X	X	X	✓	✓
Blind Stick Navigator	✓	✓	✓	✓	✓

The advantages of BlueCane [7] is the ability to navigate blind people according to route direction in the map that integrated with the board in the cane. It will focus directly onto user main location before navigate the user to current destination. Smoothness of the system is in good response time and synch with compass mechanism that will vibrate user hand when they are not in right direction. It also can calculate possible and best routes for the user to follows if they are mistakenly lost. While the disadvantages of BlueCane is the complexity of the system that only focus on the built in navigation according route given, thus lack the main function of

detecting obstacles correctly. Besides that, [8] Handsight provide big advantages touching sensor according to three modes of shape, textures, obstacles detection. Besides that, the ability to send lightness and darkness of the surface is quite interesting. This glove can be grade as a good invention but has a bit lack on not having navigation to it.

Moreover, the invention of [9] Hand-Mounted Sonar Assist for the Blind makes me become interested on looking into because of the ability to sweep the glove back and forth without giving error feedback to the board. The mechanism on using servo motor that can detect angles of movement hand glove is very informative. The disadvantage of this glove is about the blind people perception on not feeling comfortable to sweep over their hand back and forth. They felt ashamed when wandering their hand in midair. Besides that, the [10] UltraCane advantages is to detect long ranges for about 2 to 4 metres by using ultrasound system. This system is very expensively and quite unaffordable to blind people who leave in high cost economy.

2.5 Summary

In this chapter, cover most about the project functionality and reviewing the previous project that been done by other people on developing the main function to assist blind people on their daily routines. Thus, all of this idea is very good resources to the inventor or researcher to get more idea and get through with the difficulties while developing that new idea and structures.

CHAPTER 3: METHODOLOGY

3.1 Overview

In this research methodology, researcher must select the appropriate methodology for this project. The methodology chosen will guide the researcher in finishing the project successfully and achieving its objectives. A method for finding problem and ideas based on the careful use of an existing product. User research on problem finding method based via observing through user experienced of a product and aim at generating modification to or a redesign product. Brainstorming method will quickly generate a wide range of ideas and grouping through certain technique for tackling a stated problem. Checklist is for evaluating solution current process against previously establish criteria or requirements. Process discusses in this project is on hardware development through aid of diagrams from designing until final product. To conclude the methodology for this project, it is based on System Development Life Cycle (SDLC) of the Prototype Model that I will be majorly focus on planning, design, implementation and testing.

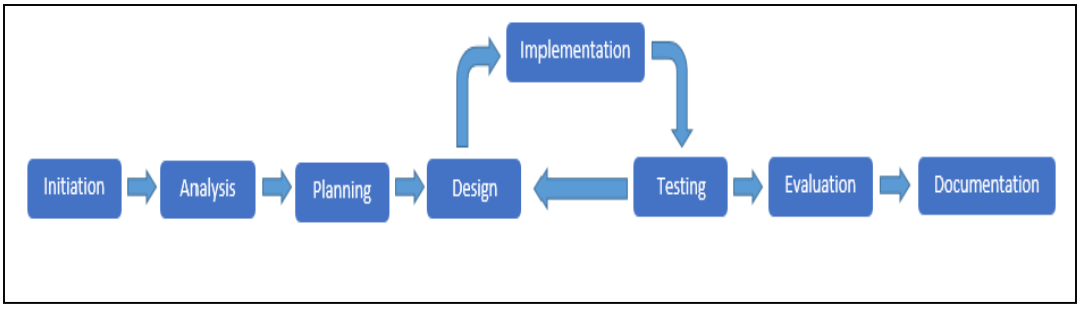


Figure 3.1: The SDLC for Prototype model.

3.2 Planning

Planning time is very important because we have 16 weeks to complete this final year project. This project working progress contains overlapping task on some weeks and student must follow the timeline to ensure this project is executed properly and on schedules. By identifying all the information that been gathered earlier will ease the process of planning for the particular software and hardware requirement needs.

3.3 Method Used

In the method of collecting information and data, a lot of sources had been referred to. Most of the information was gained Final Year Project from previous students of UniKL and some of it is from the journal and article in the internet about blind people assistant tools.

3.3.1 Hardware Requirement

All the hardware component that I will be list is very crucial to the project. Without the required component, the project won't be a great success. Planning and providing the requirement is a must in every kind of project.

Hereby is the list of the components that will be used for this project:

- Arduino Uno R3 board
- 1Sheeld board
- Ultrasonic detector
- USB cable
- Power adapter
- Battery button connector cable
- Android smartphone

The Android smartphone OS version for 1Sheeld to connect with is in version of 2.3 and above. This smartphone need to install 1Sheeld apps in order to synchronize well with the main microcontroller board.

Figure 3.2: Arduino Uno board version3 (R3).

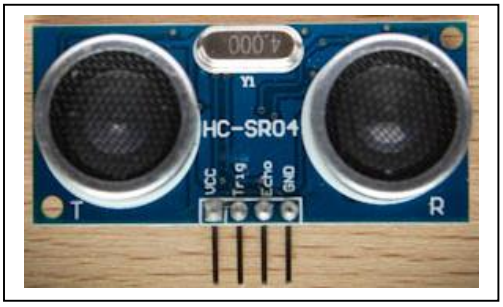


Figure 3.3: Ultrasonic detector (HC-SR04).

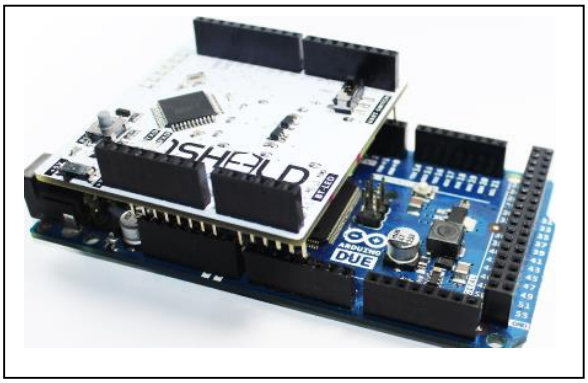


Figure 3.4: 1Sheeld integrated with Arduino Uno.

3.3.2 Software Requirement

In the software requirement, the software tools that suite with the hardware is Arduino programs along with 1Sheeld Android apps. The Arduino programs are divided in three main parts like structure, values and functions. Thus, it helps me to categorize which part of code suits the section that I needed. While, in the smartphone of the user, there will be 1Sheeld apps that helps the microcontroller board to use the features of GPS and GSM in that smartphone. Arduino main software version 1.6.3 is used for configuring process and uploading the code from Windows Operating System to the Arduino Uno R3 board via USB cable.

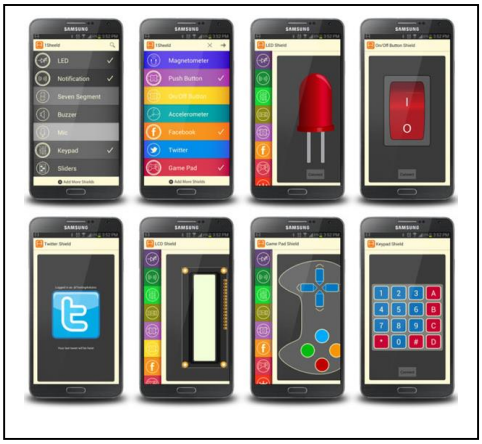


Figure 3.5: 1Sheeld apps menu

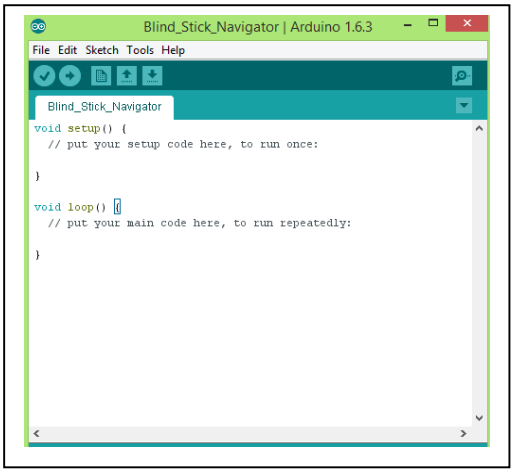


Figure 3.6: Arduino program Interface.

3.4 Design

After collecting all the data and analyze it into my understanding, I have come out with an idea on how the Blind Stick Navigator will look likes. The placement of the component is an intention to make the component to react properly in the angle of head and ground levels. It will react to obstacles and send direct feedback to the user.

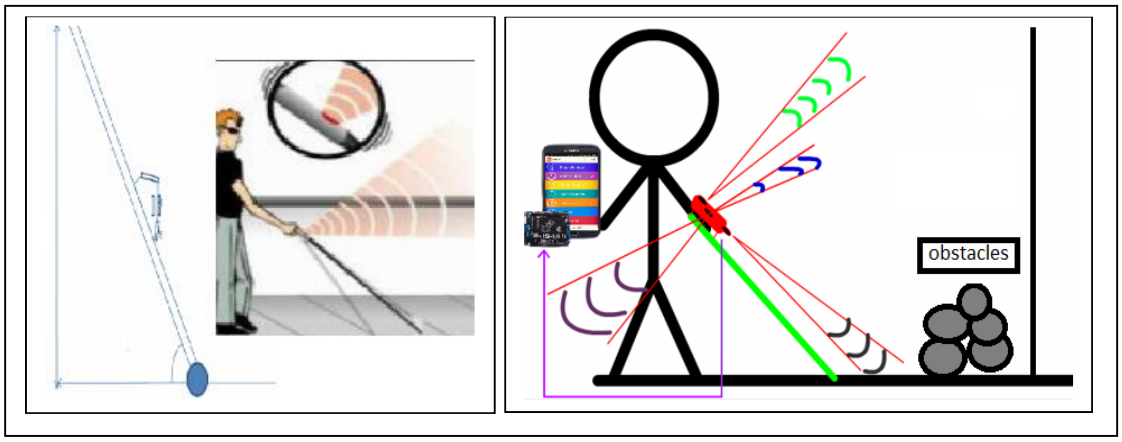


Figure 3.7: Blind stick navigator rough view.

3.4.1 Project Flowchart

Based on the draft idea that already planned earlier, the flowchart of the system is drawn in order to get the main procedure of this process without having difficulties in the future. It was divided into two main function that reflect back to each other.

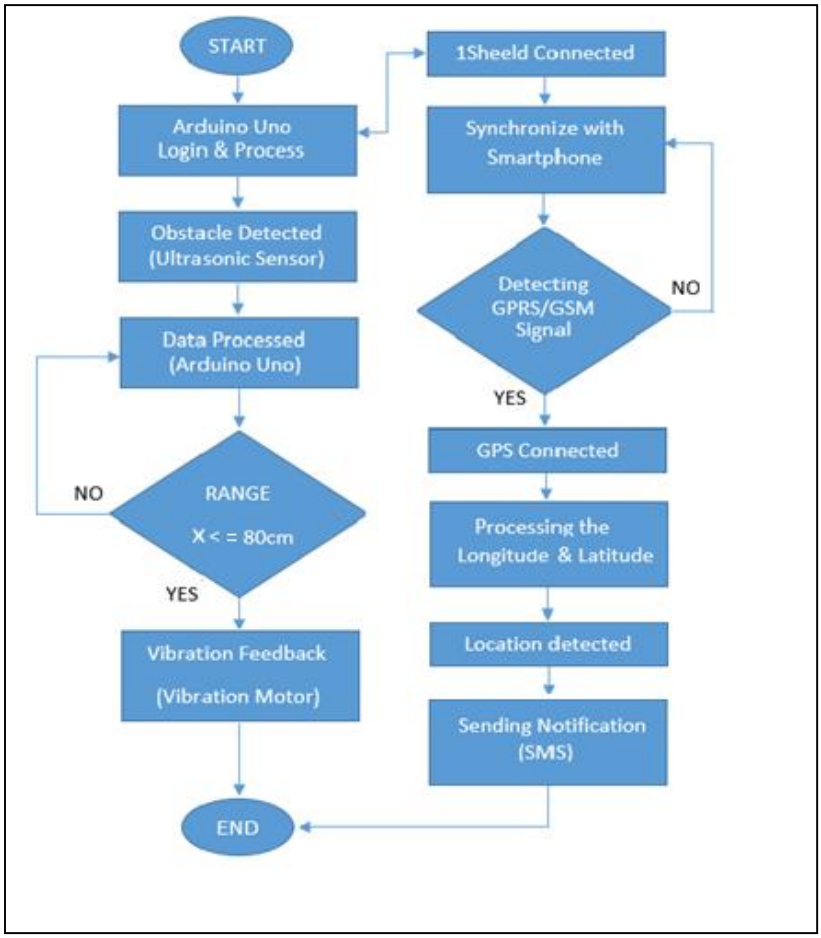


Figure 3.8: Flowchart of the Blind Stick Navigator System

3.5 Implementation

3.5.1 Block Diagram

The circuit required 5v power supply to operate well. We can power it via power adapter or 9v battery and power bank because it is easily detachable. The total power cost need can also be adjustable via processor in processing unit. Besides, Arduino Uno will process the feedback and send notification to the user smartphone in case they want the function of SMS to be on. While, the ultrasonic sensor will send notification along with vibration to the handle of the stick. Thus, Arduino Uno will become the main part of the system to work well while other component needs to function well and provide instance feedback to the system and the user.

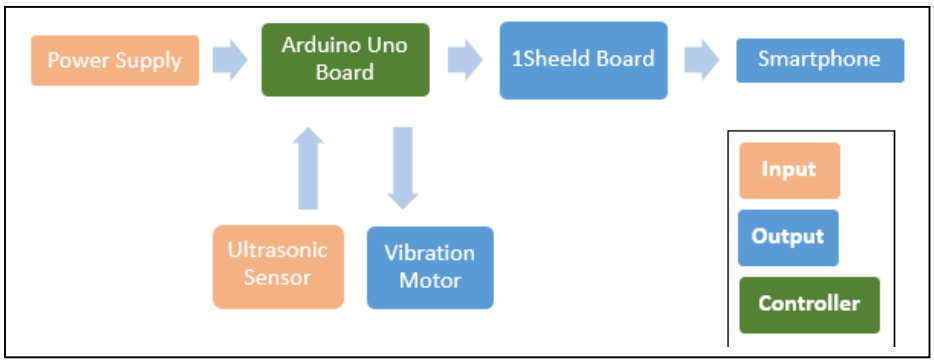


Figure 3.9: Block diagram of the Blind Stick Navigator

3.6 Checking and Testing

3.6.1 Checking

After mounting the parts of Arduino Uno board with 1Sheeld board, the important thing need to be check is the Bluetooth connection. After that, the Arduino Uno board must receive feedback from ultrasonic sensor on detecting obstacles ahead. Then, if the sensor work well, the feedback from smartphone system also must be synchronize well with the current command. The signaling process occur successfully based on the signal power that achieved from the GPS smartphone.

3.6.2 Testing

The test starts from powering on the Arduino Uno circuit and 1Sheeld board. The rest circuit connected via wires and cables that been plug into the board. Feedback from battery, the sensor, and the satellite signal also will be mark and process to display result to the hand of the user and to the receiver of the SMS notification.

3.7 Budgeting

The project has come out with the estimate cost and list of component needed and focus on not exceeding the extra budget while considering on how middle-class citizen or blind people able to support or not. Each price for each of the component is based on the current 2015 market price in Malaysia currency.

Table 3.1: Budget

List of Component				
No.	Component Name	Quantity	Unit / Price (RM)	Amount (RM)
1	Arduino Uno R3	1	80.00	80.00
2	1Sheeld	1	199.00	199.00
3	Ultrasonic detector	4	6.00	24.00
4	USB cable	1	1.00	1.00
6	Power Adapter	1	18.10	18.10
7	Battery Button Connector Cable	1	5.50	5.50
9	Cable / Jumper	1	16.70	16.70
10	Android smartphone	1	70.00	70.00
TOTAL (RM)				414.30

3.8 Project Schedule (Gantt Chart)

Hereby is the project schedule that been assigned according to each task and date that need to complete.

Figure 3.10 : Gantt Chart

Blind Stick Navigator

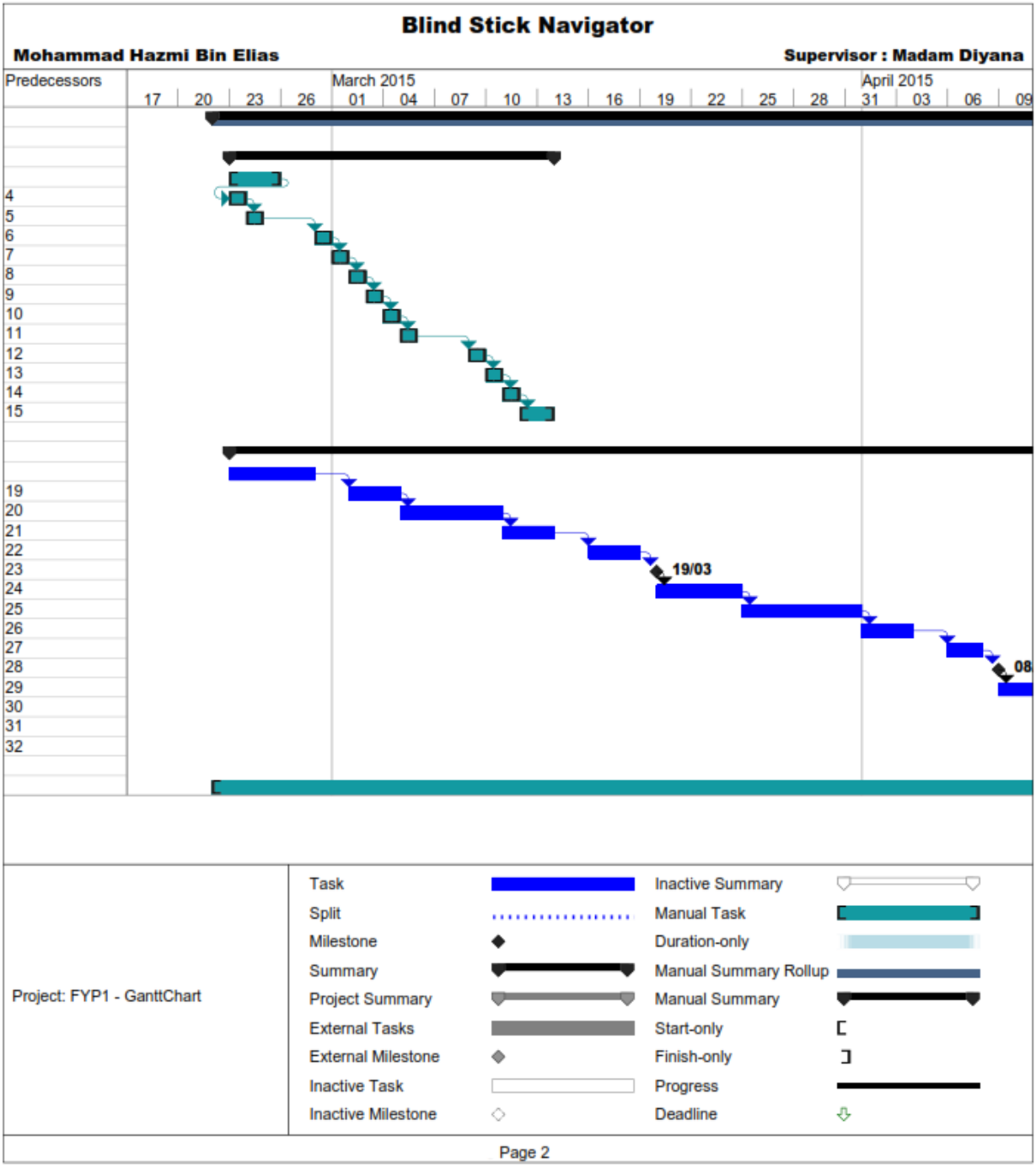
Mohammad Hazmi Bin Elias **Supervisor : Madam Diyana**

ID	Task Name	Duration	Start	Finish
1	**Blind Stick Navigator**	**72 days**	**Sun 22/02/15**	**Sat 30/05/15**
2				
3	**Initiation**	**15 days**	**Mon 23/02/15**	**Fri 13/03/15**
4	Define Project Title	3 days	Mon 23/02/15	Wed 25/02/15
5	Define Objectives	1 day	Mon 23/02/15	Mon 23/02/15
6	Define Problem Statement	1 day	Tue 24/02/15	Tue 24/02/15
7	Define Scope	1 day	Sat 28/02/15	Sat 28/02/15
8	Define Project Expected Outcomes	1 day	Sun 01/03/15	Sun 01/03/15
9	Define Project Limitation	1 day	Mon 02/03/15	Mon 02/03/15
10	Submit Proposal	1 day	Tue 03/03/15	Tue 03/03/15
11	State Project Purpose	1 day	Wed 04/03/15	Wed 04/03/15
12	State Objectives	1 day	Thu 05/03/15	Thu 05/03/15
13	State Scope	1 day	Mon 09/03/15	Mon 09/03/15
14	State Project Expected Outcomes	1 day	Tue 10/03/15	Tue 10/03/15
15	State Project Limitation	1 day	Wed 11/03/15	Wed 11/03/15
16	Chapter 1 Review with Supervisor	2 days	Thu 12/03/15	Fri 13/03/15
17				
18	**Planning & Design**	**57 days**	**Mon 23/02/15**	**Tue 12/05/15**
19	Research of Related Project Articles & Journals	5 days	Mon 23/02/15	Fri 27/02/15
20	Research of Advantages and Weakness on Different Microcontroller	3 days	Mon 02/03/15	Wed 04/03/15
21	Research of a Programming Languange	4 days	Thu 05/03/15	Tue 10/03/15
22	Research of a GPS,GSM/GPRS, Sensor modules	3 days	Wed 11/03/15	Fri 13/03/15
23	Research The Problem with Existing Projects	3 days	Mon 16/03/15	Wed 18/03/15
24	Chapter 2 Review with Supervisor	1 day	Thu 19/03/15	Thu 19/03/15
25	List Project Requirement and Specification	3 days	Fri 20/03/15	Tue 24/03/15
26	Research on how to develop this projects	5 days	Wed 25/03/15	Tue 31/03/15
27	Design Block Diagram & Flow Chart	3 days	Wed 01/04/15	Fri 03/04/15
28	Calculation Budget & Cost	2 days	Mon 06/04/15	Tue 07/04/15
29	Chapter 3 Review with Supervisor	1 day	Wed 08/04/15	Wed 08/04/15
30	Prepare for Presentation FYP 1	2 days	Thu 09/04/15	Fri 10/04/15
31	Presentation FYP 1	1 day	Mon 13/04/15	Mon 13/04/15
32	Prepare Full Report FYP 1	16 days	Tue 14/04/15	Tue 05/05/15
33	Submission Full Report FYP1	5 days	Wed 06/05/15	Tue 12/05/15
34				
35	Meeting with supervisor	72 days	Sun 22/02/15	Sat 30/05/15

Project: FYP1 - GanttChart

Task		Inactive Summary	
Split		Manual Task	
Milestone		Duration-only	
Summary		Manual Summary Rollup	
Project Summary		Manual Summary	
External Tasks		Start-only	
External Milestone		Finish-only	
Inactive Task		Progress	
Inactive Milestone		Deadline	

Page 1


Blind Stick Navigator
Mohammad Hazmi Bin Elias
Supervisor : Madam Diyana
Predecessors
March 2015
April 2015
17 20 23 26 01 04 07 10 13 16 19 22 25 28 31 03 06 09
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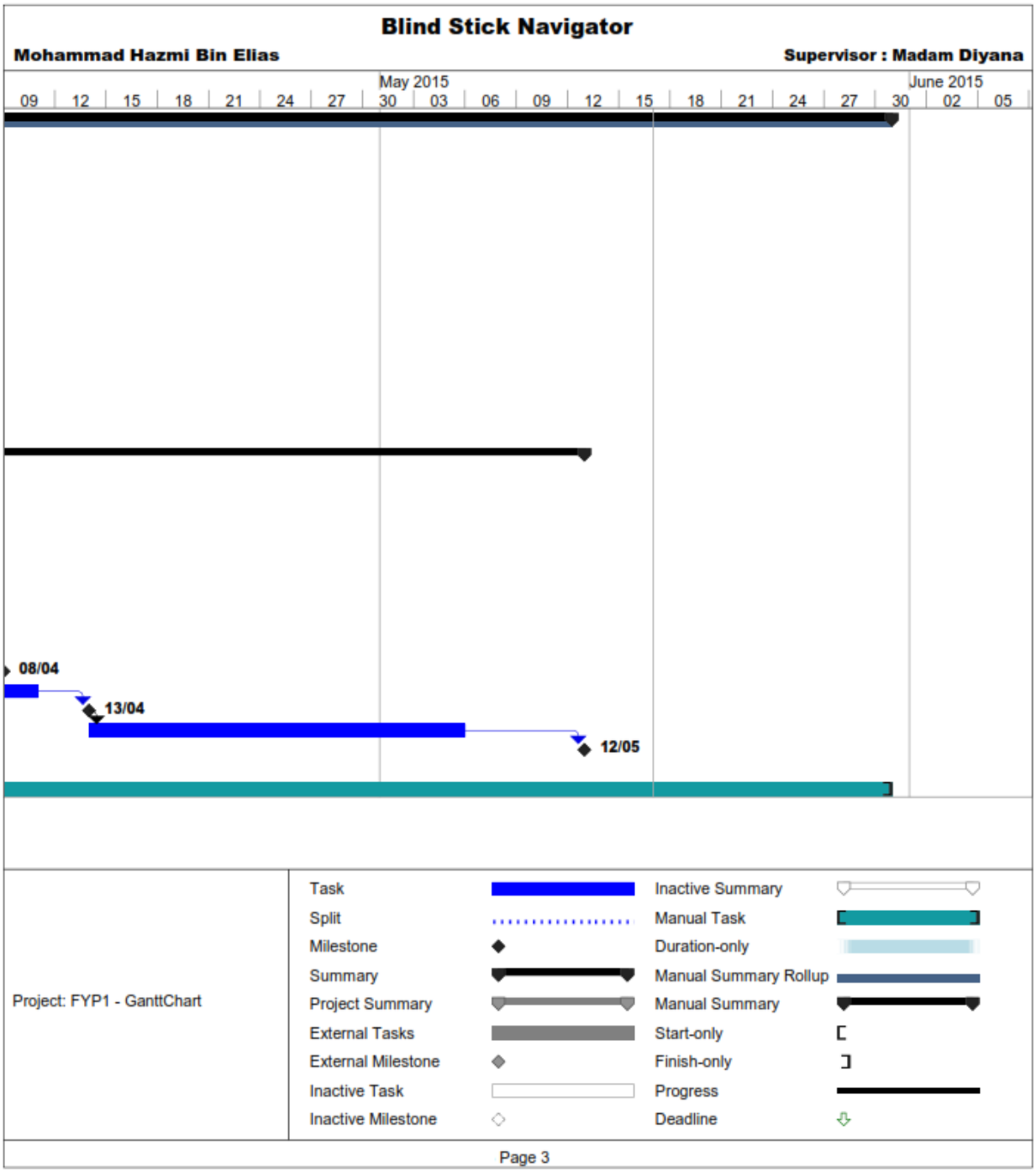
08
Project: FYP1 - GanttChart
Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Progress
Deadline
Page 2


Blind Stick Navigator
Mohammad Hazmi Bin Elias
Supervisor : Madam Diyana
May 2015
June 2015
09 12 15 18 21 24 27 30 03 06 09 12 15 18 21 24 27 30 02 05
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Project: FYP1 - GanttChart
Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Progress
Deadline
Page 3

3.9 Conclusion

In a nutshell, methodologies may be described as structured of steps, techniques, design product and processes, components and perspective. Different project has different style and way to do it. By taking the main used in my project that was Arduino Uno and 1Sheeld, I can configure the program this project without need to purchase or subscribe premium application or code. This is because this platform has intentionally created in open source system to attract researcher or inventor to invent creative product. Besides, Android application is a free, easy-to-use online utility that creates maps and profile from tracking GPS data or coordinate, street, location or place, driving routes with simple navigation. Eventhough, there are some lacks of features in this project, there are positive issue we should look at and negative issue that need to be countered.

CHAPTER 6: REFERENCES

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