D' TRAXX

Document Tracking using Radio Frequency Identification (RFID)

by

Siti Ruzzana Binti Roslant

Dissertation submitted in partial fulfilment of

the requirements for the

Bachelor of Engineering (Hons)

(Electrical & Electronics Engineering)

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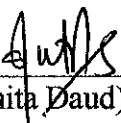# CERTIFICATION OF APPROVAL

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A project dissertation submitted to the

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(ELECTRICAL & ELECTRONICS ENGINEERING)

Approved by,

_____

(Mrs. Hanita Daud)

Project Supervisor

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

(Siti Ruzzana Binti Roslant)

ABSTRACT

This report basically discusses the progress on research done and basic understanding of the chosen topic, which is **Document Tracking using Radio Frequency Identification (RFID) Technology.** The objective of the project is to enable a break-through revolution in tracking documents using RFID. Document tracking becomes critical as to ensure proper knowledge management in an organization. Properly tracked documents provide cost savings in terms of reduced effort to locate a document, redo or rewrite a document and also prevent lost documents. RFID is the right technology of choice to implement document tracking. Equipments that are needed to achieve the objective of this project are RFID tags, RFID readers, RFID antennas and document tracking software.

ACKNOWLEDGEMENT

In the name of God, praise to Him the Almighty than in His will and given strength, I managed to complete my Final Year Project. This project is would not have been possible without the support of many people. I would like to take this opportunity to thank my supervisor, Mrs. Hanita Bt. Daud, and greatest appreciation and gratitude to my co-supervisor, Mr. Azizuddin B. Abdul Aziz, for their guidance, and huge support throughout the completion of this project.

My appreciation also goes to all Final Year Project committee members and Electrical & Electronic Department staff for extensive knowledge and insightful advices. Without their help, it is impossible for me to start and finish the work.

Particularly, I would like to express outstanding thanks to my colleagues, Mohd. Amirul Anwar B. Ibaharin and Munirah Bt. Abdul Khalil for sharing knowledge and ideas. I will embrace our friendship forever.

Last but not least, I would like to dedicate this thesis to my family for their love and support all these years. With full cooperation and encouragement from all above, I have successfully achieved the objectives of Final Year Project.

Thank you.

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CHAPTER 1

INTRODUCTION

1.1   Background of Study

In the computer era, the corporate world is still dominated by papers – perhaps because computers made it so easy to generate documents. Managing such immense amounts of paper has not proven to be an easy task – huge costs are generated in the management of document archives [4].

A variety of systems are currently used to provide some level of identification and visibility of documents. These systems are either fully manual (using manual filing system), resulting in misfiled or lost documents, or semi-automated processes based on barcodes. The big drawback of barcodes is the fact that it requires line-of-sight [4], and hence the need to handle documents one by one.

1.2   Problem Statement

Radio Frequency Identification (RFID) is an upcoming technology for tracking and identifications. Electronic chip works with radio frequency to provide wireless tracking application [1]. Each chip contains a unique identification number. Data can be stored in the chip as well.

RFID technology enables a break-through revolution in tracking documents. It is especially beneficial in those environments where the documents are of high value to the organization, and the temporary or permanent loss of a document would have significant negative impact. Once an RFID tag has been placed in a document and a RFID reader is operating, the order and efficiency of a documentation system can change significantly.

Document tracking becomes critical as to ensure proper knowledge management in an organization. Properly tracked documents provide cost savings in terms of reduced effort to locate a document, redo or rewrite a document and also prevent lost documents. RFID is the right technology of choice to implement document tracking. No line of sight required as detection can go through the document. Document information such as who is the last person who holds the document can be stored in the RFID labels. Information such as actual location of the document, date and time when the document is borrowed can be stored in the RFID labels as well [2].

1.3   Objectives

Document tracking and management is a major area of market growth, where the ability to read documents that may be overlapping or touching is a fundamental requirement. Besides that, users can monitor the movement of the documents.

Documents are not always available when they are needed. They can be misfiled, or simply misplaced. A method of knowing who had the last point of contact with the document would ensure the availability of documents at all times. An RFID document-tracking system saves time and money by drastically reducing:

- Time spent searching for lost document.

- The financial and legal impact associated with losing documents.

- Inventories are completed faster and with greater accuracy.

- Theft is diminished if not eliminated because RFID technology can detect books hidden in bags, briefcases and clothing.

- Data written in a document can be managed effectively.

1.4 Scope of Study

RFID technology is simple, robust and inexpensive. Each RFID label has a unique identification number and can be programmed with additional information such as type of media and storage location. The basic idea of using RFID to track document is a simple one:

- Each document is tagged with an RFID tag.

- Staff may also be issued RFID cards as identification for checking documents in and out.

- RFID readers at entry-points of file-room(s) are used by staff to check documents in and out.

- A web-based reporting tool allows users to query document status, location, and history.

The research and scope of study for this project is done in Universiti Teknologi PETRONAS (UTP). D' TRAXX is suitable to be used by the exam unit as for the document and data stored are of high value. Besides that, only qualified people can access to the document room, and D' TRAXX only allows people with tag to enter this room.

CHAPTER 2

LITERATURE REVIEW

2.1   Introduction

Radio Frequency is a term that refers to alternating current (AC) having characteristics such that, if the current is input to an antenna, an electromagnetic field is generated suitable for wireless broadcasting and communications [2]. These frequencies cover a significant portion of the electromagnetic radiation spectrum, extending from 9 kilohertz to thousands of gigahertz.

Any radio frequency field has a wavelength that is inversely proportional to the frequency. In the atmosphere or in outerspace, if f is the frequency in megahertz and s is the wavelength in meters, then

$$s = 300 / f$$

The radio frequency spectrum is divided into several ranges, or bands. With the exception of the lowest-frequency segment, each band represents an increase of frequency corresponding to an order of magnitude (power of 10). Table 1 depicts the eight bands in radio frequency spectrum, showing frequency and bandwidth ranges [3].

Table 1: Radio Frequency spectrum

Designation	Abbreviation	Frequencies	Free-space Wavelength
Very Low Frequency	VLF	9 kHz – 30 kHz	10 km – 100 km
Low Frequency	LF	30 kHz – 300 kHz	1 km – 10 km
Medium Frequency	MF	300 kHz – 3 MHz	100 m – 1 km
High Frequency	HF	3 MHz – 30 MHz	10 m – 100 m
Very High Frequency	VHF	30 MHz – 300 MHz	1 m – 10 m
Ultra High Frequency	UHF	300 MHz – 3 GHz	10 cm – 100 cm
Super High Frequency	SHF	3 GHz – 30 GHz	1 cm – 10 cm
Extremely Hugh Frequency	EHF	30 GHz – 300 GHz	1 mm – 10 mm

Radio Frequency Identification (RFID) is one of radio frequency applications. It is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is an object that can be applied to or incorporated into a product, animal, or person for the purpose of identification using radio waves. Some tags can be read from several meters away and beyond the line of sight (LOS) of the reader [3].

A basic RFID system consists of three components; an antenna or coil, a transceiver (with decoder) and a transponder (RF tag) electronically programmed with unique information as shown in Figure 1.
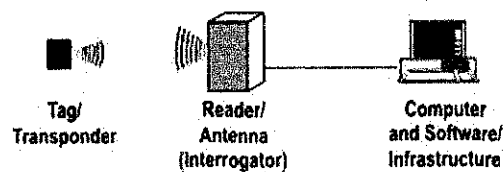
Figure 1: Basic components of RFID system.

RFID systems are also distinguished by their frequency ranges.

- Low-frequency or LF (30 KHz to 500 KHz) systems have short reading ranges and lower system costs. They are most commonly used in security access, asset tracking, and animal identification applications.

- High-frequency or HF (850 MHz to 950 MHz and 2.4 GHz to 2.5 GHz) systems, offering long read ranges (greater than 90 feet) and high reading speeds, are used for such applications as railroad car tracking and automated toll collection. However, the higher performance of high-frequency RFID systems incurs higher system costs.

- Ultra high frequency or UHF

Figure 2 below shows the block diagram of a basic RFID circuit system [5].
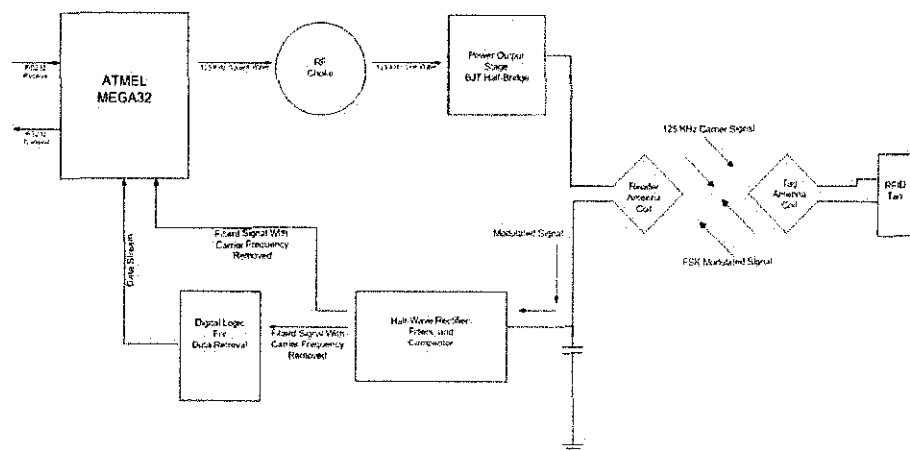
Figure 2: Block diagram of RFID circuit system

2.2   Antenna / Reader

The antenna emits radio signals to activate the tag and to read and write data to it. Antennas are the conduits between the tag and the transceiver, which controls the system's data acquisition and communication. The electromagnetic field produced by an antenna can be constantly present when

multiple tags are expected continually. If constant interrogation is not required, the field can be activated by a sensor device.

Figure 3 below shows the basic configuration of reader and tag antenna in any RFID application [6].
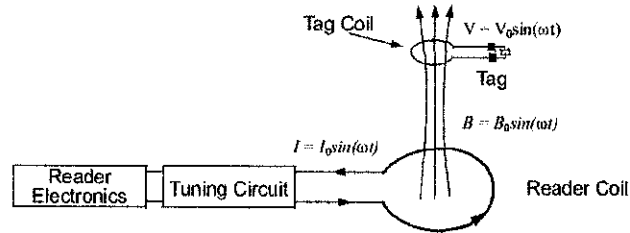
Figure 3: A basic configuration of reader and tag antennas in RFID applications

The reader antenna can be made of either a single coil, which is typically forming a series or parallel resonant circuit, or double loop (transformer) antenna coil. Figure 4 shows various configurations of reader antenna circuit [6].

(a) Series Resonant Circuit   (b) Parallel Resonant Circuit

(c) Transformer Loop Antenna
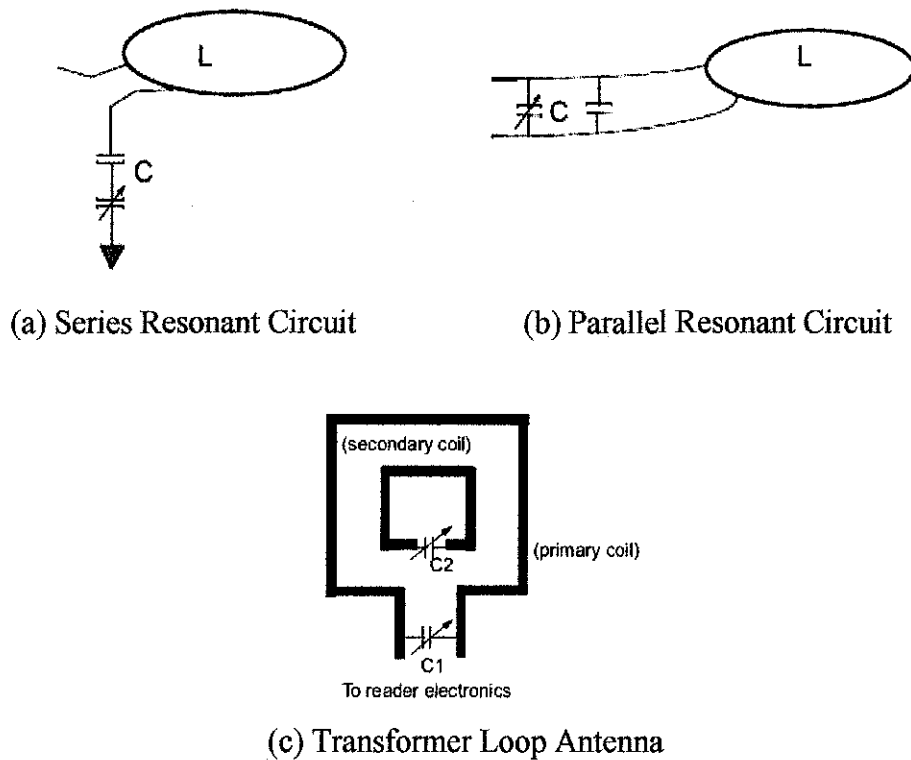
Figure 4: Various Reader Antenna Circuit

7

Often the antenna is packaged with the transceiver and decoder to become a reader, which can be configured either as a handheld or a fixed-mount device [9]. The reader emits radio waves in ranges of anywhere, depending upon its power output and the radio frequency used. When an RFID tag passes through the electromagnetic zone, it detects the reader's activation signal. The reader decodes the data encoded in the tag's integrated circuit and the data is passed to the host computer for processing [3]. Examples of RFID antenna are:

i.   13.56 MHz High Frequency (HF) Reader RFID Writer with Antenna

Figure 5: High Frequency Reader RFID Writer with Antenna

ii.   13.56 MHz High Frequency (HF) SD Interface RFID Reader

Figure 6: High Frequency SD Interface RFID Reader

iii.   UHF 902 MHz Gen 2 Intermec IP4 Portable Handheld RFID Reader

Figure 7: Portable Handheld RFID Reader

2.3   Tag

RFID tags come in three general varieties; passive, active or semi-passive. Passive tags require no internal power source, thus being pure passive devices (they are only active when a reader is nearby to power them), whereas semi-passive and active tags require a power source, usually a small battery [8]. To communicate, tags respond to queries generating signals that must not create interference with the readers, as arriving signals can be very weak and must be differentiated.

Figure 8 shows the schematic circuit of a passive RFID Tag [5]. From this figure, we can see that a passive RFID Tag consists of half-wave rectifier, RC filter, comparator and filter.
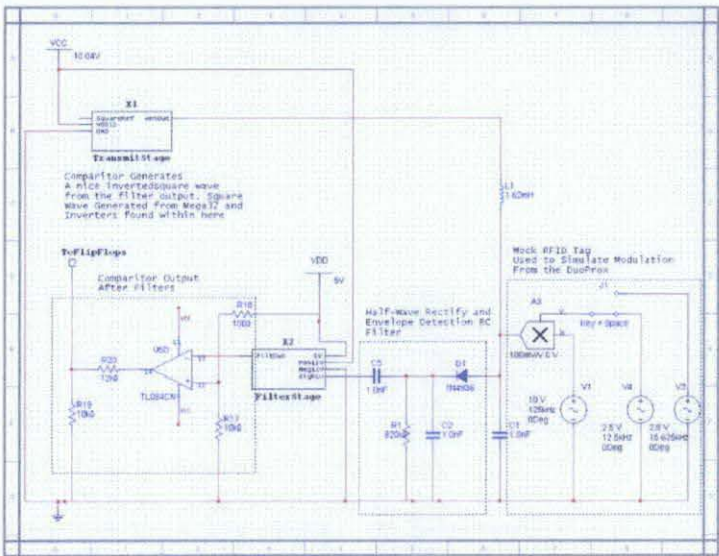
Figure 8: Schematic circuit of RFID Tag

RFID tags have a wide variety of shapes and sizes. Animal tracking tags, inserted beneath the skin, can be as small as a pencil lead in diameter and one-half inch in length. Tags can be screw-shaped to identify trees or wooden items, or credit-card shaped for use in access applications [7]. The anti-theft hard plastic tags attached to merchandise in stores are RFID tags. In addition, heavy-duty 5- by 4- by 2-inch rectangular transponders used to track intermodal containers or heavy machinery, trucks, and railroad cars for maintenance and tracking applications are RFID tags. Examples of RFID tags are:

i.   13.56 MHz. High Frequency (HF) Rectangle Paper RFID Tag
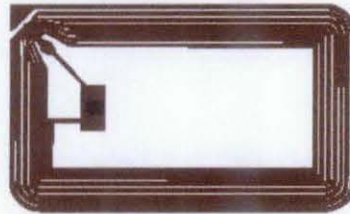
Figure 9: Rectangle Paper RFID Tag

ii.   UHF 902 MHz Gen 2 Alien Mini-Squiggle RFID tag Passive

Figure 10: Mini-Squiggle RFID tag Passive

iii.   13.56 MHz High Frequency (HF) Round Paper RFID Tag

Figure 11: High Frequency Round Paper RFID Tag

2.4   Active and Passive RFID

RFID tags are categorized as either active or passive.

2.4.1   Active RFID

Active RFID is a long range communication approach that has a reading distance between 50 m (150 feet) to 100 m (300 feet). Tags are powered by an internal battery and are typically read/write, where tag data can be rewritten and/or modified. An active tag's memory size varies according to application requirements; some systems operate with up to 1MB of memory. In a typical read/write RFID work-in-process system, a tag might give a machine a set of instructions, and the machine would then report its performance to the tag [5]. This encoded data would then become part of the tagged part's history. The battery-supplied power of an active tag generally gives it a longer read range. The trade off is greater size, greater cost, and a limited operational life (which may yield a maximum of 10 years, depending upon operating temperatures and battery type).

2.4.2   Passive RFID

Tags operate without a separate external power source and obtain operating power generated from the reader. Passive tags are

consequently much lighter than active tags, less expensive, and offer a virtually unlimited operational lifetime. The trade off is that they have shorter read ranges than active tags and require a higher-powered reader. Read-only tags are typically passive and are programmed with a unique set of data (usually 32 to 128 bits) that cannot be modified. Read-only tags most often operate as a license plate into a database, in the same way as linear barcodes reference a database containing modifiable product-specific information.

2.5   Advantages

The significant advantage of all types of RFID systems is the noncontact, non-line-of-sight nature of the technology. Tags can be read through a variety of substances such as snow, fog, ice, paint, crusted grime, and other visually and environmentally challenging conditions, where bar codes or other optically read technologies would be useless. RFID tags can also be read in challenging circumstances at remarkable speeds, in most cases responding in less than 100 milliseconds. The read/write capability of an active RFID system is also a significant advantage in interactive applications such as work-in-process or maintenance tracking. Though it is a costlier technology (compared with bar code), RFID has become indispensable for a wide range of automated data collection and identification applications that would not be possible otherwise [8].

Developments in RFID technology continue to yield larger memory capacities, wider reading ranges, and faster processing. It is highly unlikely that the technology will ultimately replace bar code — even with the inevitable reduction in raw materials coupled with economies of scale, the integrated circuit in an RF tag will never be as cost-effective as a barcode label. However, RFID will continue to grow in its established niches where bar code or other optical technologies are not effective.

2.6   Current Document Tracking Application

2.6.1   DocuTrack3000

DocuTrack3000 is a total RFID solution for document tracking as shown in Figure 12. It includes RFID labels, RFID reader and a document tracking software. DocuTrack3000 is designed to keep track of electronic documents and hard copy documents such as project file, document file and many others. Books and file can be tracked in the application in details [5].
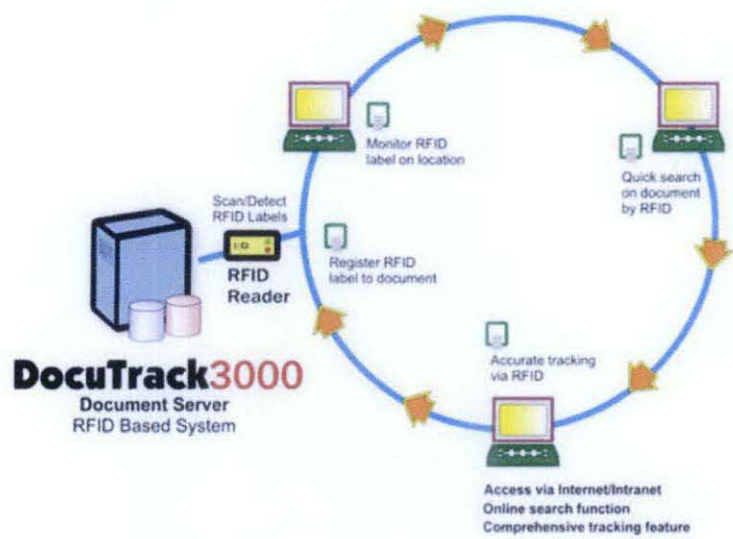
Figure 12: DocuTrack3000 system diagram

Place reader at the document check in and checkout section for issuing of documents. Each document will be scanned and check in and checkout time is recorded. Location and the user of the document can be tracked. Effectively, a comprehensive document tracking system is implemented using DocuTrack3000 [5].

2.6.2   GAO RFID Asset Tracking's LocateWare

An RFID middleware that simplifies the data capture and distribution and reporting part of your project. LocateWare enables comprehensive tracking, locating and identification for a wide range

of businesses. The suite consists of three compatible software products for radio frequency data management – RFLink, RFView and WebView.
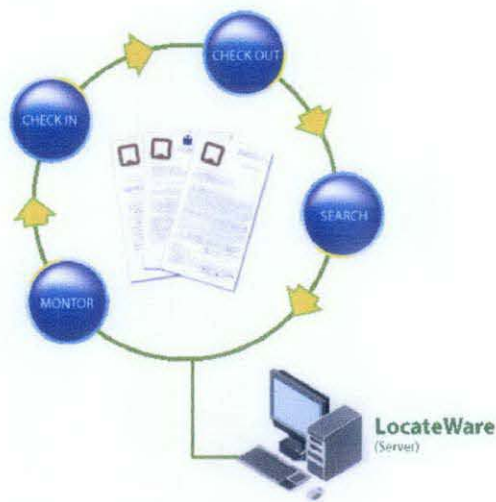
Figure 13: LocateWare system overview for document tracking

LocateWare, as shown in Figure 13, together with GAO RFID Asset Tracking's RFID readers successfully capture and distribute RFID tag information to the user in a customized report format for their unique job requirements. Document trays with RFID readers can hold as many as one hundred documents that can be read at one time. The number of documents read simultaneously can grow to the thousands just by adding more antennae in the read vicinity.

CHAPTER 3

METHODOLOGY

3.1 Planned Project Timeline

3.1.1 Gantt Chart

Table 2: Gantt Chart

No	Details / Week	1	2	3	4	5	6	7	8	9	10	11		12	13	14
1	Selection of Project Topic	■	■													
2	Preliminary Research Work		■	■	■											
3	Submission of Preliminary Report				■											
4	Seminar 1 (optional)					■	■	■								
5	Project Work					■	■	■								
6	Submission of Progress Report								■							
7	Seminar 2 (compulsory)									■	■	■		■		
8	Project work continues								■	■	■	■		■		
9	Submission of Interim Report Final Draft														■	
10	Oral Presentation															■

3.1.2   Project Flowchart

In order to begin with this project, submission of title and project synopsis has been done earlier and approved by the supervisor. Project work continues and submissions of reports are done continuously throughout the development of this project.

Seminar are arranged by the supervisor as to discuss further about the progress of the project. An internal examiner attended this seminar to evaluate the performance and to remark any comment regarding the project.

The final oral presentation is done after the final examination and evaluated by the supervisor, internal examiner and external examiner, which is from the industry. Any changes to the dissertation report are done within a week after the final oral presentation. Figure 14 shows the flowchart of this project.

```
                    ┌─────────────────┐
                    │      START      │
                    └─────────────────┘
                             │
          ┌──────────────────▼──────────────────┐
          │      Submission of Title &          │
NOT       │         Project Synopsis            │
ACCEPTED  └──────────────────┬──────────────────┘
                             │
                      ◇ Approval on ◇
                      ◇ Project Proposal ◇
                      ◇ & Supervisor ◇
                             │
              ┌──────────────▼──────────────┐
              │   Submission of Progress    │
              │         Report I            │
              └──────────────┬──────────────┘
              ┌──────────────▼──────────────┐
              │    Seminar 1 (compulsory)   │
              └──────────────┬──────────────┘
              ┌──────────────▼──────────────┐
              │    Project work continues   │
              └──────────────┬──────────────┘
              ┌──────────────▼──────────────┐
              │   Submission of Progress    │
              │         Report 2            │
              └──────────────┬──────────────┘
              ┌──────────────▼──────────────┐
              │         Assessment          │
              └──────────────┬──────────────┘
              ┌──────────────▼──────────────┐
              │    Seminar 2 (compulsory)   │
              └──────────────┬──────────────┘
              ┌──────────────▼──────────────┐
              │       Submission of         │
              │  Dissertation Final Draft   │
              └──────────────┬──────────────┘
              ┌──────────────▼──────────────┐
              │   Final Oral Presentation   │
              └──────────────┬──────────────┘
                    ┌────────▼────────┐
                    │      END        │
                    └─────────────────┘
```
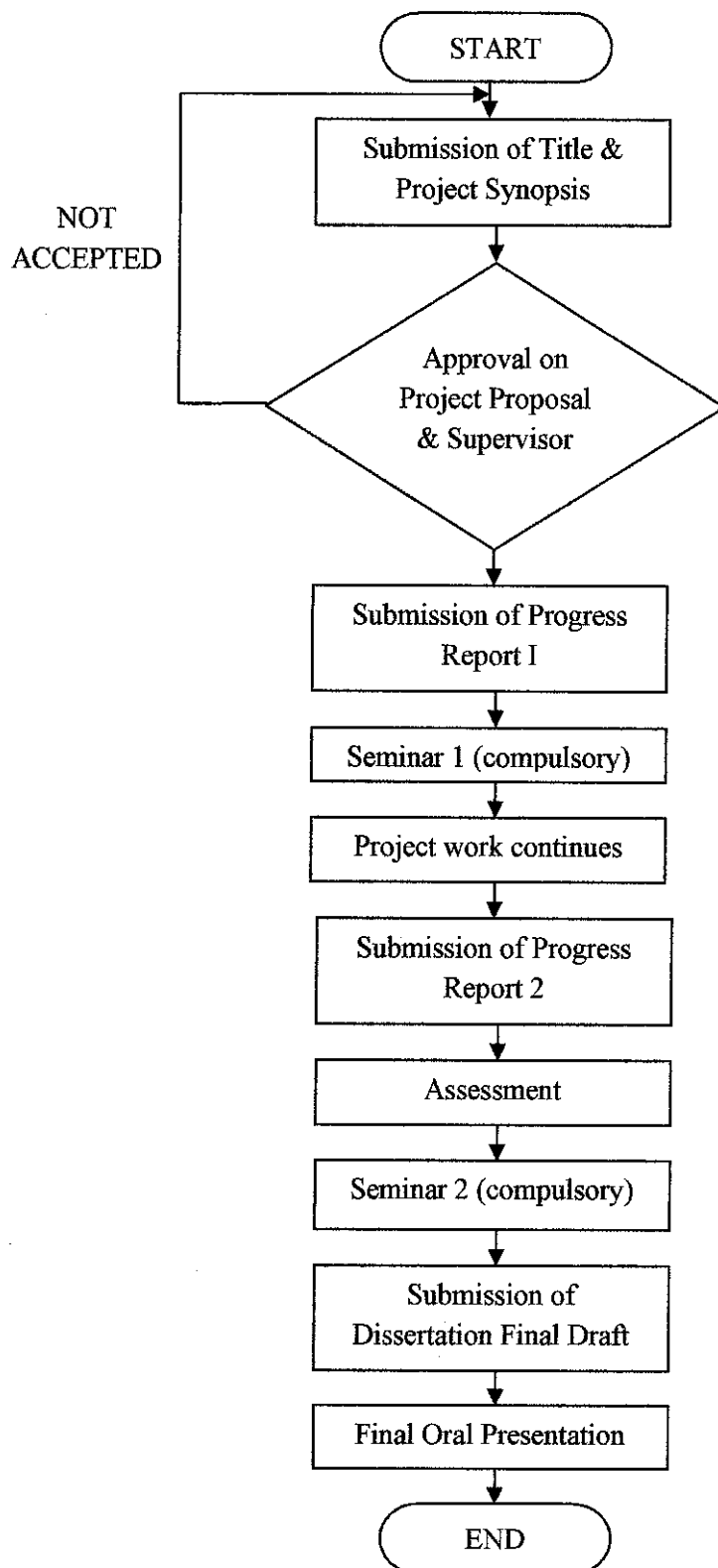
Figure 14: Project Flowchart

3.2 Applied Tools and Technology

3.2.1 Survey

A set of survey questions have been distributed to 35 respondents of UTP staff at the early stage of this project. Survey questions and results are attached under Appendix B and Appendix C.

Based on the outcome of this survey, almost 65% of the respondents found out that they need an improvement in their daily document tracking solution, such as D' TRAXX.

3.2.2 RFID Tags

Conceptually, a RFID circuit would be attached to a file folder that the document resides in. The circuit would contain a preset unique identification number.

3.2.3 RFID Readers

A RFID reader pad would be connected to a computer. When the computer file for the document is being set up in the computer, this RFID pad would automatically read the unique RFID circuit number and software would associate this number to the file known by description being entered into the computer.

RFID circuit readers are the size of smoke detectors would be installed by all relevant doorways. Each reader has a unique ID number and the software would know each reader location. When a file is taken out and go through a doorway, the software would capture this and present a path of doorways the file goes through. The readers do not require line of sight (LOS) to read the file number as it passes through the doorway. The readers can be hard wired into a

network or transmit their data back to a central server or via wireless RF communications.

When a file location is desired, the user calls up the tracking software program and types in a file known by. The system then traces the path of the file and reports the last doorway read point the file was seen at. This narrows the search to a room.

3.2.4   Authentication and Access Control Database Server

A secure database system is installed in the department to record access to documents. The database has security levels appropriate to the needs of the department. The system records an audit trail of the document and the people that have handled or made requests for the document.

First, the database is created in order to store details about the users and documents. Users' details such as user's identification number, password and full name are created, followed by the documents' details such as the document number, document title and location.

Then, the user interface is formed based on the database created. The login interface is first produced to let the users an easy access to the database. User's identification number and password must match correctly, and this data is retrieved from the database. Once the user has entered the correct identification number and password, the user will be directed to the homepage.

User history can be checked under this homepage. Data is retrieved from the database, as well as from the hardware. Besides that, a search box is made available under user's homepage. The details of the searched document will be prompted, based on the

availability of the document. The data will be retrieved from the database, as well as from the hardware.

3.3   Architectural Overview

Architectural overview is to explain about the concept of this project. It consists of the room and document layouts. Besides that, the detailed process of D' TRAXX is also being explained under this architectural overview.

1. Room layout

Figure 15 shows the document room layout of this project.
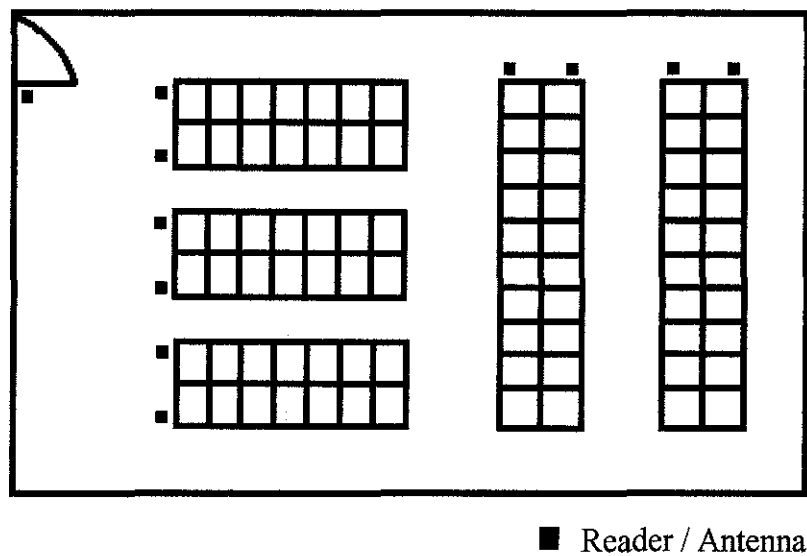
■ Reader / Antenna

Figure 15: Room Layout

2. Entrance

    Reader / Antenna will be activated when $\overset{\circ}{\curlywedge} \leq \mathbf{l}$, where $\mathbf{l}$ is the detection range of the reader, as shown in Figure 16.
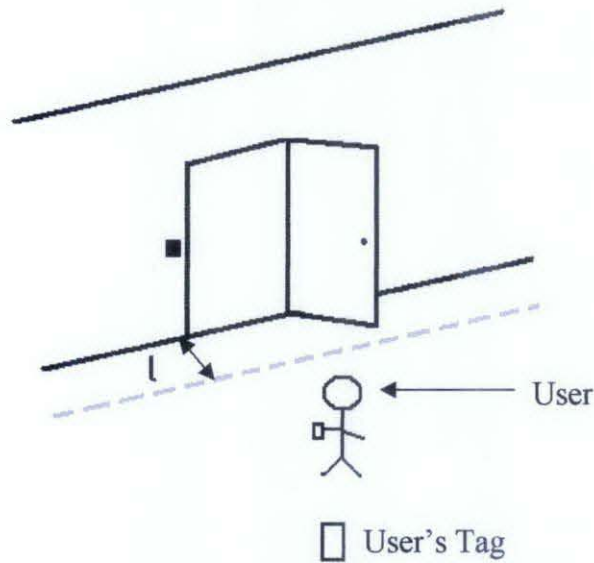
□ User's Tag

Figure 16: Entrance

User's details such as name, ID number and date will be updated on the database.

3. Documents Layout

    Figure 17 shows the documents layout, where each document is tagged with a passive RFID tag and a reader is placed at the left-hand side of the shelf.

• Document's Tag ■ Reader / Antenna
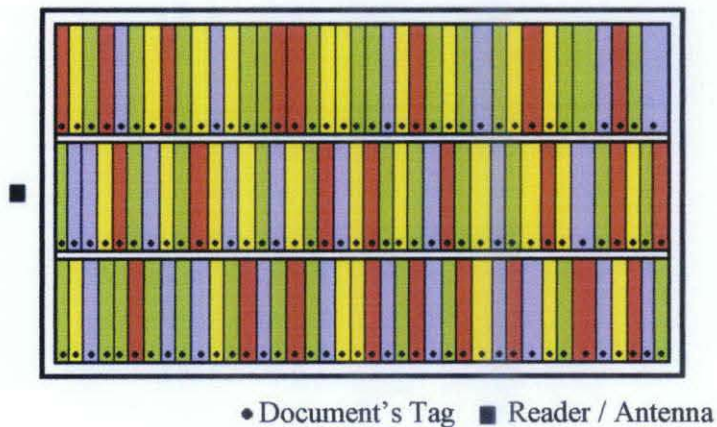
Figure 17: Documents layout

4. Access to documents

User's Tag

(a)   (b)
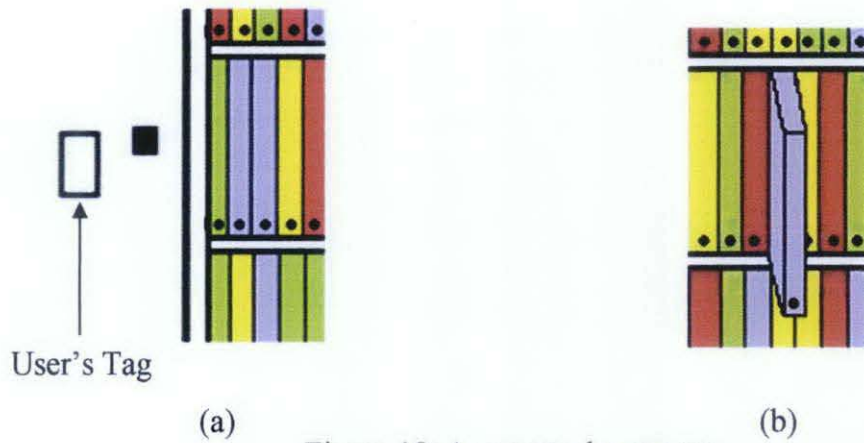
Figure 18: Access to documents

User's tag will be activated once user approaches the shelf as shown in Figure 18 (a). User's details will be updated on the database. If any document is being taken out, document's details will be recorded as shown in Figure 18 (b).

5. Exit

Reader / Antenna will be activated when $\underset{\curlywedge}{\circ} \leq l$ as shown in Figure 19. User's and document's details will be updated on the database.
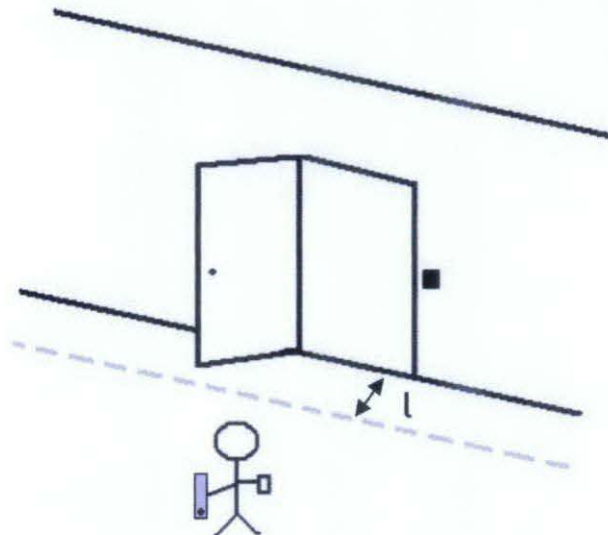
Figure 19: Exit

6. Return

When user enters the room, reader will read both tags, and data will be stored.

Figure 20: Return

User's Tag

(a)   (b)
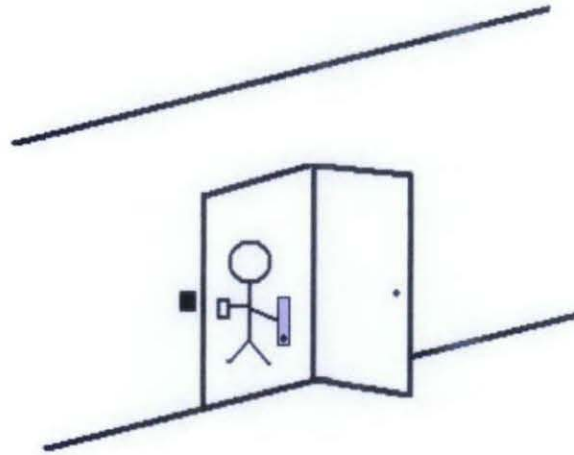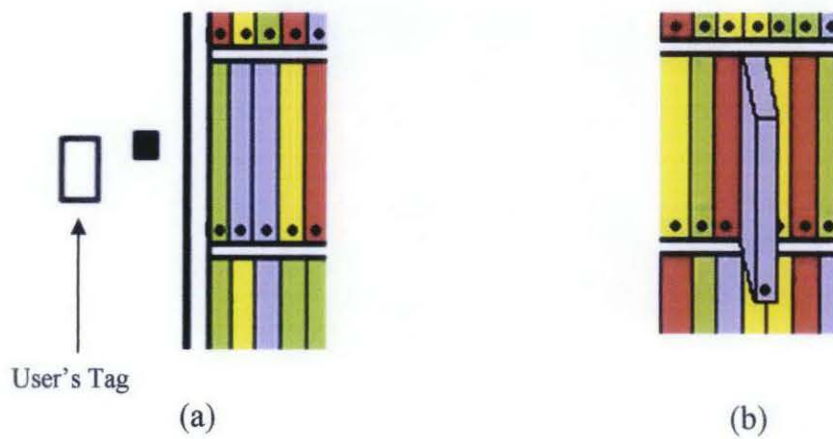
Figure 21: Return the documents

User's tag will be activated once user approaches the shelf as shown in Figure 21 (a). User's details will be updated on the database. The document must be placed at its original place, and document's details will be recorded as shown in Figure 21 (b).

iv. Exit

When exiting as shown in Figure 22, reader will read user's tag and user's details will be updated on the database.
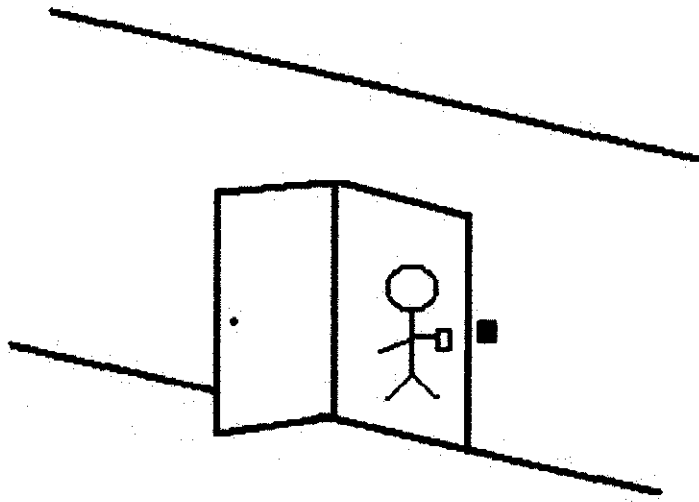
Figure 22: Exit after returning the documents.

To simplify the architectural overview of this system, Figure 23 explains it in a flowchart method.
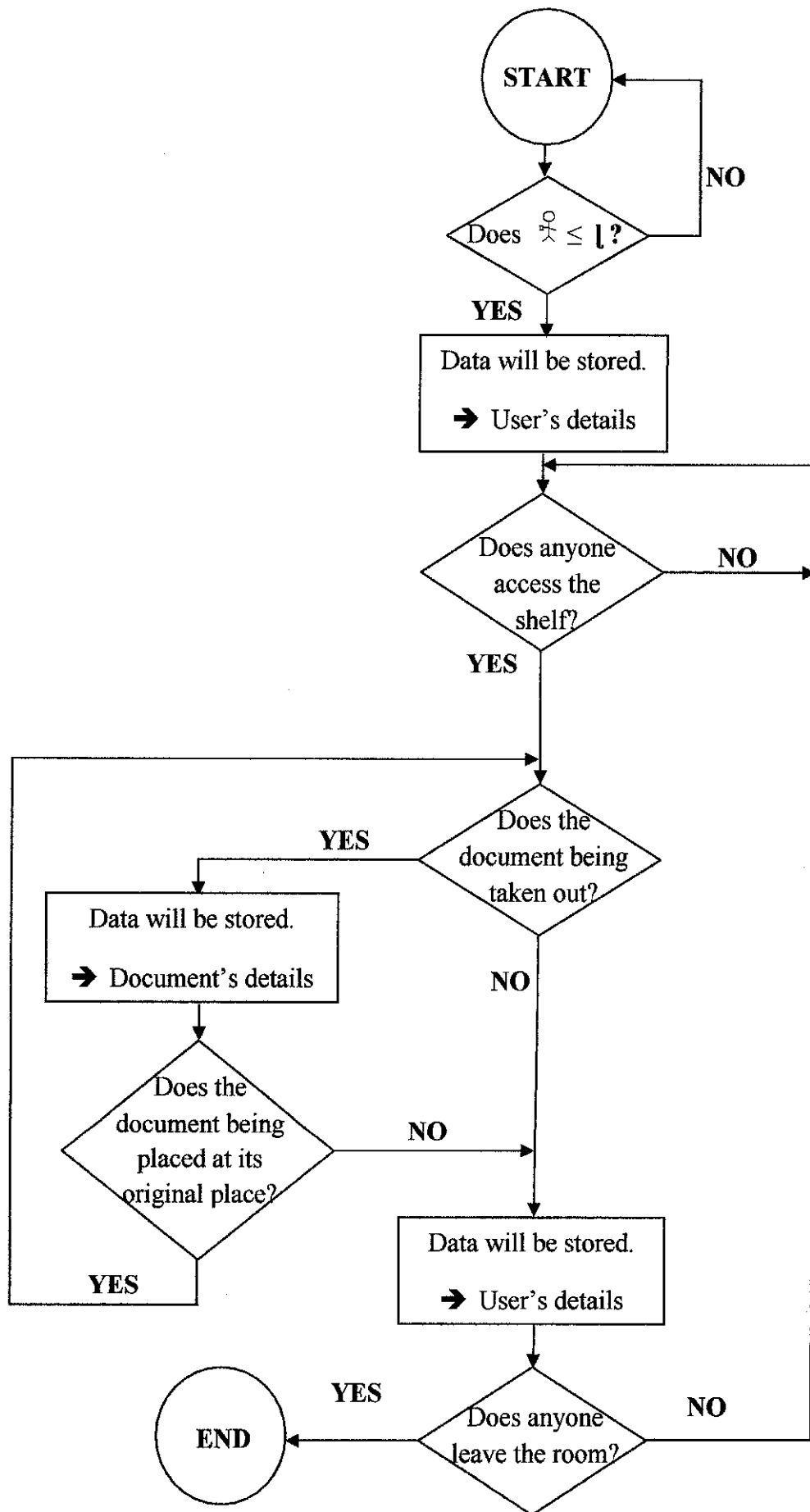
Figure 23: Flowchart of the system.

CHAPTER 4

RESULTS & DISCUSSION

4.1 Results

4.1.1 User Interface

Once the user enters the ID number as shown in Figure 24, a prompt window will appear to show either the ID number and password are entered correctly, as shown in Figure 25 and Figure 26.
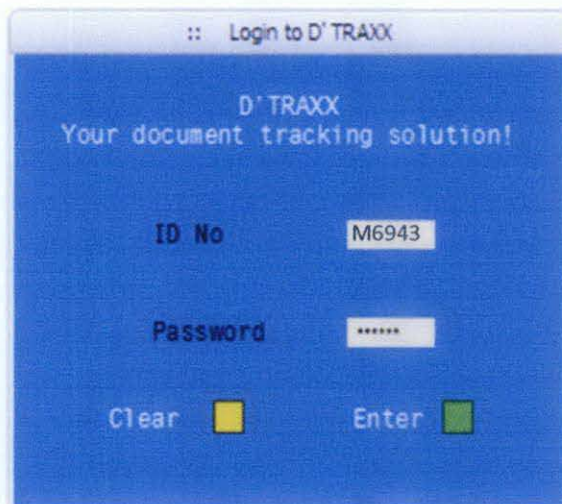
Figure 24: User interface.

Figure 25: Prompt window when ID number and password are entered correctly

Figure 26: Prompt window when ID number and password are entered wrongly.

Once the log in is successful, user will be directed to the main page of D' TRAXX as shown in Figure 27. In this window, user can check for their current status of accessing any related document. Besides that, user can also search for any document needed in this window.

Figure 27: User's main window.

The document number is entered and a prompt window will appear. If the document is available in the document room, a prompt window shown in Figure 28 will appear to show the exact title and also location of the searched document. If the searched document is unavailable at the document room, a prompt window as shown in Figure 29 will appear. This shows the current user who is holding the document at the moment.
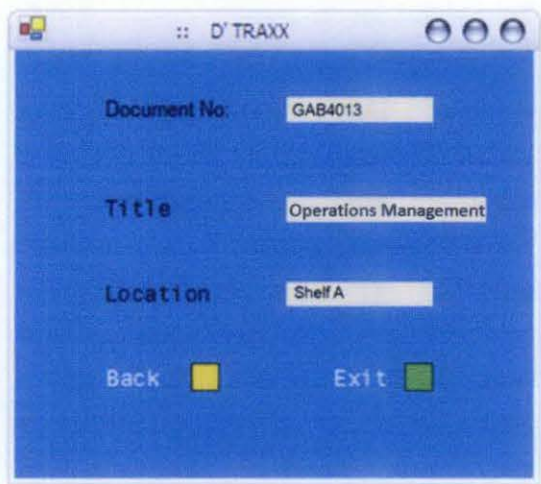
Figure 28: Prompt window to show the location of the searched document.

Figure 29: Prompt window to show the current user of the searched document.

4.1.2   System Database

The database consists of two tables, which are documents table and users table.

4.1.2.1 Documents

Under documents, details listed are the document number and document title, as shown in Figure 30 and Figure 31. Only documents listed in the database are allowed to be in the document room.
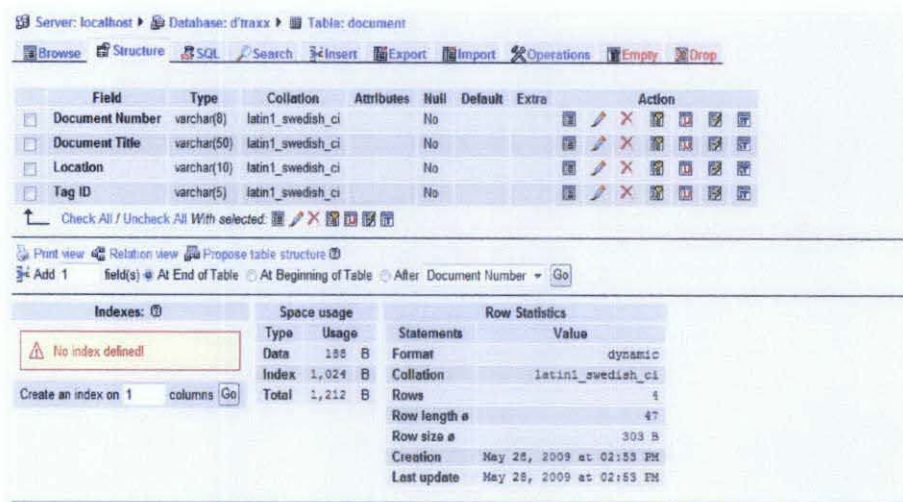
Figure 30: Database for documents
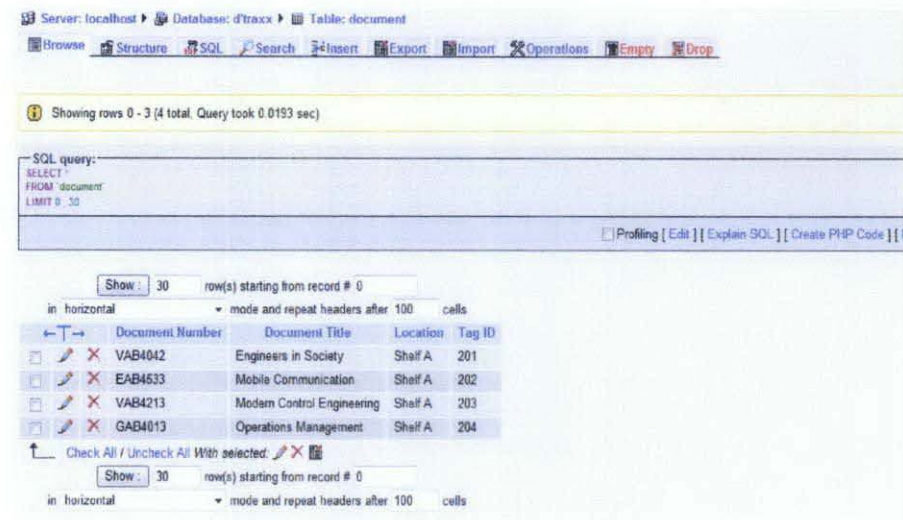
Figure 31: Contents for document table

4.1.2.2 Users

As for the users table as shown in Figure 32 and Figure 33, user's identification number and full name will be stored. Only users listed in the database are allowed to enter the document room, and access to any documents.
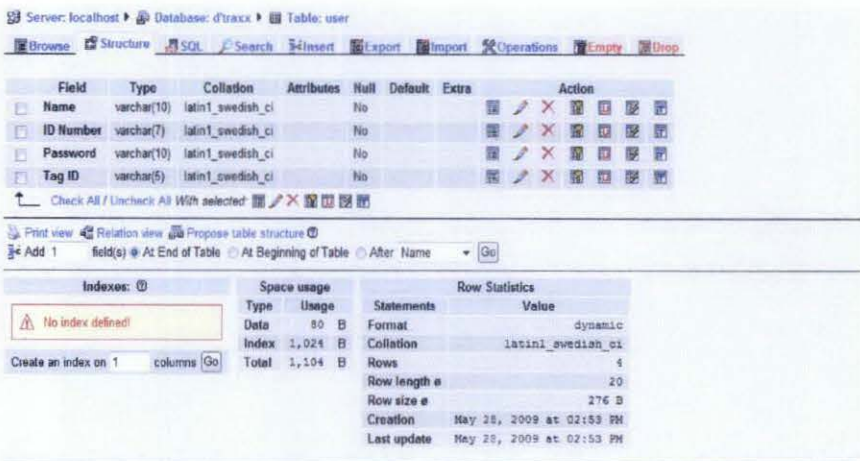
Figure 32: Database for users
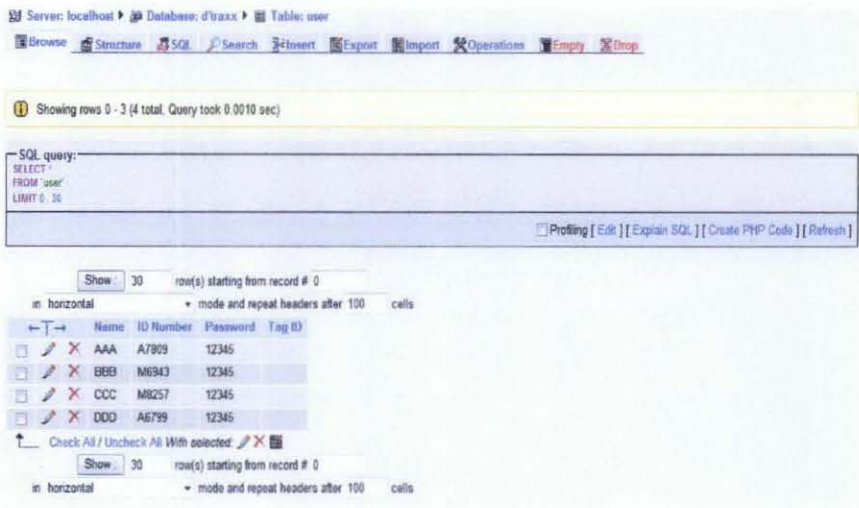
Figure 33: Contents for user table

4.1.3   Hardware

This project uses Active RFID Reader and Tag, which has a distance range of up to 80 m, and the frequency ranges from 3 MHz to 30 MHz.

4.1.3.1 Active RFID Reader

Active RFID reader as shown in Figure 34 will be used. The range will be adjusted to suit the architectural layout. This reader will be installed at the entrance of the room, as well as at each shelf.

Figure 34: Active RFID Reader

4.1.3.2 Active RFID Tag

Active RFID Card Tag as shown in Figure 35 will be used. This tag will be placed at each folder of the documents. User also will be using the same tag as in Figure 35. Once the reader senses the presence of this tag, data will be stored automatically.

Figure 35: Active RFID Card Tag

4.2   Discussion

While this project has been completed, along the way there were of course a number of problems encountered. Firstly prior to the coding stage of the project, a detailed understanding of VB.net and phpMyAdmin had to be acquired. This was achieved via self-learning of coding some basic programs and getting the help from other friends. After gaining an in depth knowledge of VB.net and phpMyAdmin, a vast deal of further research had to be undertaken.

This project involved at the outset, a steep learning curve into the field of computer programming. This added significantly to the production time of the project but was necessary for its completion. There were a lot of elements

of investigation in this project where different ideas were explored, which have now become acquired knowledge.

As for the hardware, some difficulty had been encountered at the initial stage. The late arrival of active readers and tags had delayed the progress of this project. Besides that, due to the insufficient amount of hardware, readers and tags were shared between friends. However, things would probably now be completed faster as a result of all that has been learned throughout the duration of the project.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

It is highly recommended to use RFID for tracking document to any organization, which lose of document will give a big impact. By using D' TRAXX, movement of documents can be traced using a simple user interface system. The cost for D' TRAXX is high, due to the technology that is being used. However, this initial cost to install D' TRAXX is bearable in a long-term. D' TRAXX is suitable for an organization with high document value.

5.2 Recommendations

Future efforts that are to be undertaken for the project will be having much stronger security to access the document room. User's photo and telephone number could be included to achieve more efficient system.

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gaorfidassettracking.com

<http://www.gaorfidassettracking.com/RFID_Asset_Tracking_Applications/
RFID_Document_Tracking.php>

APPENDICES

Appendix A

System Coding

Login

```vbnet
Imports System
Imports System.ComponentModel
Imports System.Threading
Imports System.Windows.Forms
Imports System.Runtime.InteropServices
Imports Microsoft.VisualBasic
Imports System.IO
Imports MySql.Data.MySqlClient

Public Class frmLogin

    Dim strCn As String = "Database=s'traxx_db;Data
Source=localhost;User Id=root;Password="

    Private Sub frmLogin_Load(ByVal sender As System.Object, ByVal e
As System.EventArgs) Handles MyBase.Load


    End Sub



    Private Sub btn_confirm_Click(ByVal sender As System.Object,
    ByVal e As System.EventArgs) Handles btn_confirm.Click
        Dim id As String = TextBox1.Text.ToString
        Dim rowsCheck As Integer = 0
        Dim pswd As String = TextBox2.Text.ToString

        Dim cn As New MySqlConnection(strCn)

        Dim cmdCheck As New MySqlCommand("SELECT * FROM user WHERE
        id = '" & id & "'", cn)
        Dim daCheck As New MySqlDataAdapter
        Dim dsCheck As New DataSet
        Dim dtCheck As New DataTable

        cn.Open()

        'Check from table (search)
        Try
            With daCheck
                .SelectCommand = cmdCheck
                .Fill(dsCheck, "searchresult")
            End With
            dtCheck = dsCheck.Tables("searchresult")
            rowsCheck = dtCheck.Rows.Count()


            'If unable to connect, show error
        Catch ex As Exception
            MsgBox("Wrong ID / Password!!" & ex.Message,
            MsgBoxStyle.OkOnly, "Error!")
        End Try

        'If already connected, close connection
        If ConnectionState.Open Then
            cn.Close()
        End If

    End Sub
```

```vbnet
    Private Sub btn_Oclose_Click(ByVal sender As System.Object,
ByVal e As System.EventArgs) Handles btn_Oclose.Click
        Me.Close()
    End Sub

End Class
```

___

Homepage

```vbnet
Public Class frmHome
    Inherits System.Windows.Forms.Form

#Region " Windows Form Designer generated code "

    Public Sub New()
        MyBase.New()

        'This call is required by the Windows Form Designer.
        InitializeComponent()

        'Add any initialization after the InitializeComponent() call

    End Sub

    'Form overrides dispose to clean up the component list.
    Protected Overloads Overrides Sub Dispose(ByVal disposing As
Boolean)
        If disposing Then
            If Not (components Is Nothing) Then
                components.Dispose()
            End If
        End If
        MyBase.Dispose(disposing)
    End Sub

    'Required by the Windows Form Designer
    Private components As System.ComponentModel.IContainer

    'NOTE: The following procedure is required by the Windows Form
    Designer
    'It can be modified using the Windows Form Designer.
    'Do not modify it using the code editor.

    Friend WithEvents lblGreeting As System.Windows.Forms.Label
    Friend WithEvents Label1 As System.Windows.Forms.Label
    Friend WithEvents Label2 As System.Windows.Forms.Label
    Friend WithEvents Label3 As System.Windows.Forms.Label
    Friend WithEvents btnSearch As System.Windows.Forms.Button
    Friend WithEvents txtDocNo As System.Windows.Forms.TextBox
    Friend WithEvents DataGrid1 As System.Windows.Forms.DataGrid

    <System.Diagnostics.DebuggerStepThrough()> Private Sub
    InitializeComponent()
        Me.lblGreeting = New System.Windows.Forms.Label
        Me.Label1 = New System.Windows.Forms.Label
```

```
            Me.Label2 = New System.Windows.Forms.Label
            Me.Label3 = New System.Windows.Forms.Label
            Me.txtDocNo = New System.Windows.Forms.TextBox
            Me.btnSearch = New System.Windows.Forms.Button
            Me.DataGrid1 = New System.Windows.Forms.DataGrid
            CType(Me.DataGrid1,
System.ComponentModel.ISupportInitialize).BeginInit()
            Me.SuspendLayout()
            '
            'lblGreeting
            '
            Me.lblGreeting.Font = New System.Drawing.Font("Arial
monospaced for SAP", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
            Me.lblGreeting.ForeColor = System.Drawing.Color.Gold
            Me.lblGreeting.Location = New System.Drawing.Point(176, 24)
            Me.lblGreeting.Name = "lblGreeting"
            Me.lblGreeting.Size = New System.Drawing.Size(128, 19)
            Me.lblGreeting.TabIndex = 119
            Me.lblGreeting.Text = "Welcome BBB!"
            Me.lblGreeting.TextAlign =
System.Drawing.ContentAlignment.MiddleLeft
            '
            'Label1
            '
            Me.Label1.ForeColor = System.Drawing.Color.Gold
            Me.Label1.Location = New System.Drawing.Point(32, 64)
            Me.Label1.Name = "Label1"
            Me.Label1.TabIndex = 120
            Me.Label1.Text = "BBB History"
            '
            'Label2
            '
            Me.Label2.ForeColor = System.Drawing.Color.Gold
            Me.Label2.Location = New System.Drawing.Point(32, 272)
            Me.Label2.Name = "Label2"
            Me.Label2.Size = New System.Drawing.Size(144, 23)
            Me.Label2.TabIndex = 122
            Me.Label2.Text = "Looking for a document?"
            '
            'Label3
            '
            Me.Label3.ForeColor = System.Drawing.Color.Gold
            Me.Label3.Location = New System.Drawing.Point(32, 304)
            Me.Label3.Name = "Label3"
            Me.Label3.Size = New System.Drawing.Size(88, 23)
            Me.Label3.TabIndex = 123
            Me.Label3.Text = "Document No."
            '
            'txtDocNo
            '
            Me.txtDocNo.BackColor = System.Drawing.Color.Bisque
            Me.txtDocNo.BorderStyle =
System.Windows.Forms.BorderStyle.None
            Me.txtDocNo.CharacterCasing =
System.Windows.Forms.CharacterCasing.Lower
            Me.txtDocNo.Font = New System.Drawing.Font("Arial monospaced
for SAP", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
            Me.txtDocNo.Location = New System.Drawing.Point(128, 304)
            Me.txtDocNo.Name = "txtDocNo"
```

```
        Me.txtDocNo.Size = New System.Drawing.Size(160, 14)
        Me.txtDocNo.TabIndex = 124
        Me.txtDocNo.Text = ""
        '
        'btnSearch
        '
        Me.btnSearch.BackColor = System.Drawing.Color.LightSkyBlue
        Me.btnSearch.Location = New System.Drawing.Point(336, 304)
        Me.btnSearch.Name = "btnSearch"
        Me.btnSearch.TabIndex = 125
        Me.btnSearch.Text = "Search"
        '
        'DataGrid1
        '
        Me.DataGrid1.DataMember = ""
        Me.DataGrid1.HeaderForeColor =
System.Drawing.SystemColors.ControlText
        Me.DataGrid1.Location = New System.Drawing.Point(40, 96)
        Me.DataGrid1.Name = "DataGrid1"
        Me.DataGrid1.Size = New System.Drawing.Size(360, 152)
        Me.DataGrid1.TabIndex = 126
        '
        'frmHome
        '
        Me.AutoScaleBaseSize = New System.Drawing.Size(5, 13)
        Me.BackColor = System.Drawing.Color.SteelBlue
        Me.ClientSize = New System.Drawing.Size(442, 380)
        Me.ControlBox = False
        Me.Controls.Add(Me.DataGrid1)
        Me.Controls.Add(Me.btnSearch)
        Me.Controls.Add(Me.txtDocNo)
        Me.Controls.Add(Me.Label3)
        Me.Controls.Add(Me.Label2)
        Me.Controls.Add(Me.Label1)
        Me.Controls.Add(Me.lblGreeting)
        Me.FormBorderStyle =
System.Windows.Forms.FormBorderStyle.FixedSingle
        Me.Name = "frmHome"
        Me.StartPosition =
System.Windows.Forms.FormStartPosition.CenterScreen
        Me.Text = "::     D' TRAXX"
        Me.WindowState =
System.Windows.Forms.FormWindowState.Maximized
        CType(Me.DataGrid1,
System.ComponentModel.ISupportInitialize).EndInit()
        Me.ResumeLayout(False)

    End Sub

#End Region

    Private Sub frmHome_Load(ByVal sender As Object, ByVal e As
System.EventArgs) Handles MyBase.Load
        lblGreeting.Text = "Welcome, " & anyuser & "."


    End Sub

    Private Sub btnSearch_Click(ByVal sender As System.Object, ByVal
e As System.EventArgs) Handles btnSearch.Click
        If txtDocNo.Text = True Then
```

```
            Dim frmSearch As New frmSearch
            frmSearch.ShowDialog()
        ElseIf txtDocNo.Text = False Then
            Dim frmSearch2 As New frmSearch2
            frmSearch2.ShowDialog()
        End If
    End Sub
End Class
```

Available Document (Search 1)

```
Public Class frmSearch
    Inherits System.Windows.Forms.Form

#Region " Windows Form Designer generated code "

    Public Sub New()
        MyBase.New()

        'This call is required by the Windows Form Designer.
        InitializeComponent()

        'Add any initialization after the InitializeComponent() call

    End Sub

    'Form overrides dispose to clean up the component list.
    Protected Overloads Overrides Sub Dispose(ByVal disposing As
Boolean)
        If disposing Then
            If Not (components Is Nothing) Then
                components.Dispose()
            End If
        End If
        MyBase.Dispose(disposing)
    End Sub

    'Required by the Windows Form Designer
    Private components As System.ComponentModel.IContainer

    'NOTE: The following procedure is required by the Windows Form
Designer
    'It can be modified using the Windows Form Designer.
    'Do not modify it using the code editor.
    Friend WithEvents Label1 As System.Windows.Forms.Label
    Friend WithEvents Label2 As System.Windows.Forms.Label
    Friend WithEvents Label3 As System.Windows.Forms.Label
    Friend WithEvents Label4 As System.Windows.Forms.Label
    Friend WithEvents Label10 As System.Windows.Forms.Label
    Friend WithEvents btnBack As System.Windows.Forms.Button
    Friend WithEvents btnExit As System.Windows.Forms.Button
    Friend WithEvents txtDocNo As System.Windows.Forms.TextBox
    Friend WithEvents txtLoc As System.Windows.Forms.TextBox
    Friend WithEvents txtTitle As System.Windows.Forms.TextBox
    <System.Diagnostics.DebuggerStepThrough()> Private Sub
InitializeComponent()
```

```vbnet
        Me.Label1 = New System.Windows.Forms.Label
        Me.txtDocNo = New System.Windows.Forms.TextBox
        Me.Label2 = New System.Windows.Forms.Label
        Me.Label3 = New System.Windows.Forms.Label
        Me.txtLoc = New System.Windows.Forms.TextBox
        Me.txtTitle = New System.Windows.Forms.TextBox
        Me.Label4 = New System.Windows.Forms.Label
        Me.btnBack = New System.Windows.Forms.Button
        Me.Label10 = New System.Windows.Forms.Label
        Me.btnExit = New System.Windows.Forms.Button
        Me.SuspendLayout()
        '
        'Label1
        '
        Me.Label1.Location = New System.Drawing.Point(16, 24)
        Me.Label1.Name = "Label1"
        Me.Label1.Size = New System.Drawing.Size(96, 16)
        Me.Label1.TabIndex = 0
        Me.Label1.Text = "Document No:"
        '
        'txtDocNo
        '
        Me.txtDocNo.BackColor = System.Drawing.Color.Bisque
        Me.txtDocNo.BorderStyle =
System.Windows.Forms.BorderStyle.None
        Me.txtDocNo.CharacterCasing =
System.Windows.Forms.CharacterCasing.Lower
        Me.txtDocNo.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.txtDocNo.Location = New System.Drawing.Point(120, 24)
        Me.txtDocNo.Name = "txtDocNo"
        Me.txtDocNo.Size = New System.Drawing.Size(160, 14)
        Me.txtDocNo.TabIndex = 2
        '
        'Label2
        '
        Me.Label2.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.Label2.Location = New System.Drawing.Point(16, 128)
        Me.Label2.Name = "Label2"
        Me.Label2.Size = New System.Drawing.Size(80, 16)
        Me.Label2.TabIndex = 4
        Me.Label2.Text = "Location"
        Me.Label2.TextAlign =
System.Drawing.ContentAlignment.MiddleLeft
        '
        'Label3
        '
        Me.Label3.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.Label3.Location = New System.Drawing.Point(16, 80)
        Me.Label3.Name = "Label3"
        Me.Label3.Size = New System.Drawing.Size(80, 16)
        Me.Label3.TabIndex = 3
        Me.Label3.Text = "Title"
        Me.Label3.TextAlign =
System.Drawing.ContentAlignment.MiddleLeft
        '
```

```vbnet
'txtLoc
'
        Me.txtLoc.BackColor = System.Drawing.Color.Bisque
        Me.txtLoc.BorderStyle =
System.Windows.Forms.BorderStyle.None
        Me.txtLoc.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.txtLoc.Location = New System.Drawing.Point(120, 128)
        Me.txtLoc.Name = "txtLoc"
        Me.txtLoc.PasswordChar =
Global.Microsoft.VisualBasic.ChrW(42)
        Me.txtLoc.Size = New System.Drawing.Size(160, 14)
        Me.txtLoc.TabIndex = 6
        '
        'txtTitle
        '
        Me.txtTitle.BackColor = System.Drawing.Color.Bisque
        Me.txtTitle.BorderStyle =
System.Windows.Forms.BorderStyle.None
        Me.txtTitle.CharacterCasing =
System.Windows.Forms.CharacterCasing.Lower
        Me.txtTitle.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.txtTitle.Location = New System.Drawing.Point(120, 80)
        Me.txtTitle.Name = "txtTitle"
        Me.txtTitle.Size = New System.Drawing.Size(160, 14)
        Me.txtTitle.TabIndex = 5
        '
        'Label4
        '
        Me.Label4.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.Label4.ForeColor = System.Drawing.SystemColors.Control
        Me.Label4.Location = New System.Drawing.Point(24, 176)
        Me.Label4.Name = "Label4"
        Me.Label4.Size = New System.Drawing.Size(80, 19)
        Me.Label4.TabIndex = 85
        Me.Label4.Text = "Back"
        Me.Label4.TextAlign =
System.Drawing.ContentAlignment.MiddleRight
        '
        'btnBack
        '
        Me.btnBack.BackColor = System.Drawing.Color.Gold
        Me.btnBack.Cursor = System.Windows.Forms.Cursors.Hand
        Me.btnBack.FlatStyle = System.Windows.Forms.FlatStyle.Popup
        Me.btnBack.Font = New System.Drawing.Font("Trebuchet MS",
8.25!, System.Drawing.FontStyle.Bold,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.btnBack.ForeColor =
System.Drawing.SystemColors.ControlText
        Me.btnBack.Location = New System.Drawing.Point(120, 176)
        Me.btnBack.Name = "btnBack"
        Me.btnBack.Size = New System.Drawing.Size(16, 16)
        Me.btnBack.TabIndex = 83
        Me.btnBack.UseVisualStyleBackColor = False
        '
        'Label10
```

```vbnet
        '
        Me.Label10.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.Label10.ForeColor = System.Drawing.SystemColors.Control
        Me.Label10.Location = New System.Drawing.Point(176, 176)
        Me.Label10.Name = "Label10"
        Me.Label10.Size = New System.Drawing.Size(56, 19)
        Me.Label10.TabIndex = 84
        Me.Label10.Text = "Exit"
        Me.Label10.TextAlign =
System.Drawing.ContentAlignment.MiddleRight
        '
        'btnExit
        '
        Me.btnExit.BackColor = System.Drawing.Color.Lime
        Me.btnExit.Cursor = System.Windows.Forms.Cursors.Hand
        Me.btnExit.FlatStyle = System.Windows.Forms.FlatStyle.Popup
        Me.btnExit.Font = New System.Drawing.Font("Trebuchet MS",
8.25!, System.Drawing.FontStyle.Bold,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.btnExit.ForeColor =
System.Drawing.SystemColors.ControlText
        Me.btnExit.Location = New System.Drawing.Point(240, 176)
        Me.btnExit.Name = "btnExit"
        Me.btnExit.Size = New System.Drawing.Size(16, 16)
        Me.btnExit.TabIndex = 82
        Me.btnExit.UseVisualStyleBackColor = False
        '
        'frmSearch
        '
        Me.AutoScaleBaseSize = New System.Drawing.Size(5, 13)
        Me.BackColor = System.Drawing.Color.SteelBlue
        Me.ClientSize = New System.Drawing.Size(292, 242)
        Me.Controls.Add(Me.Label4)
        Me.Controls.Add(Me.btnBack)
        Me.Controls.Add(Me.Label10)
        Me.Controls.Add(Me.btnExit)
        Me.Controls.Add(Me.txtLoc)
        Me.Controls.Add(Me.txtTitle)
        Me.Controls.Add(Me.Label2)
        Me.Controls.Add(Me.Label3)
        Me.Controls.Add(Me.txtDocNo)
        Me.Controls.Add(Me.Label1)
        Me.Name = "frmSearch"
        Me.Text = "::    D' TRAXX"
        Me.ResumeLayout(False)
        Me.PerformLayout()

    End Sub

#End Region

    Private Sub btnBack_Click(ByVal sender As System.Object, ByVal e
As System.EventArgs) Handles btnBack.Click
        Dim frmHome As New frmHome
        frmHome.ShowDialog()
    End Sub

    Private Sub btnExit_Click(ByVal sender As System.Object, ByVal e
As System.EventArgs) Handles btnExit.Click
```

```vbnet
        Dim frmLogin As New frmLogin
        frmLogin.ShowDialog()
    End Sub

    Private Sub frmSearch_Load(ByVal sender As System.Object, ByVal
e As System.EventArgs) Handles MyBase.Load

    End Sub
End Class
```

Unavailable Document (Search 2)

```vbnet
Imports System.Data
Imports System.Configuration
Imports System.Windows.Forms
Imports System.Data.SqlClient
Imports System.Data.OleDb.OleDbConnection
Imports System.Data.OleDb.OleDbCommand
Public Class frmSearch2
    Inherits System.Windows.Forms.Form

#Region " Windows Form Designer generated code "

    Public Sub New()
        MyBase.New()

        'This call is required by the Windows Form Designer.
        InitializeComponent()

        'Add any initialization after the InitializeComponent() call

    End Sub

    'Form overrides dispose to clean up the component list.
    Protected Overloads Overrides Sub Dispose(ByVal disposing As
Boolean)
        If disposing Then
            If Not (components Is Nothing) Then
                components.Dispose()
            End If
        End If
        MyBase.Dispose(disposing)
    End Sub

    'Required by the Windows Form Designer
    Private components As System.ComponentModel.IContainer

    'NOTE: The following procedure is required by the Windows Form
Designer
    'It can be modified using the Windows Form Designer.
    'Do not modify it using the code editor.
    Friend WithEvents Label10 As System.Windows.Forms.Label
    Friend WithEvents btnExit As System.Windows.Forms.Button
    Friend WithEvents txtTitle As System.Windows.Forms.TextBox
    Friend WithEvents Label3 As System.Windows.Forms.Label
    Friend WithEvents txtDocNo As System.Windows.Forms.TextBox
    Friend WithEvents Label1 As System.Windows.Forms.Label
```

```
        Friend WithEvents Label2 As System.Windows.Forms.Label
        Friend WithEvents Label5 As System.Windows.Forms.Label
        Friend WithEvents txtDate As System.Windows.Forms.TextBox
        Friend WithEvents Label4 As System.Windows.Forms.Label
        Friend WithEvents txtCurrentuser As System.Windows.Forms.TextBox
        Friend WithEvents btnReset As System.Windows.Forms.Button
        <System.Diagnostics.DebuggerStepThrough()> Private Sub
InitializeComponent()
            Me.Label4 = New System.Windows.Forms.Label
            Me.btnReset = New System.Windows.Forms.Button
            Me.Label10 = New System.Windows.Forms.Label
            Me.btnExit = New System.Windows.Forms.Button
            Me.txtCurrentuser = New System.Windows.Forms.TextBox
            Me.txtTitle = New System.Windows.Forms.TextBox
            Me.Label3 = New System.Windows.Forms.Label
            Me.txtDocNo = New System.Windows.Forms.TextBox
            Me.Label1 = New System.Windows.Forms.Label
            Me.txtDate = New System.Windows.Forms.TextBox
            Me.Label2 = New System.Windows.Forms.Label
            Me.Label5 = New System.Windows.Forms.Label
            Me.SuspendLayout()
            '
            'Label4
            '
            Me.Label4.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
            Me.Label4.ForeColor = System.Drawing.SystemColors.Control
            Me.Label4.Location = New System.Drawing.Point(24, 224)
            Me.Label4.Name = "Label4"
            Me.Label4.Size = New System.Drawing.Size(80, 19)
            Me.Label4.TabIndex = 95
            Me.Label4.Text = "Clear"
            Me.Label4.TextAlign =
System.Drawing.ContentAlignment.MiddleRight
            '
            'btnReset
            '
            Me.btnReset.BackColor = System.Drawing.Color.Gold
            Me.btnReset.Cursor = System.Windows.Forms.Cursors.Hand
            Me.btnReset.FlatStyle = System.Windows.Forms.FlatStyle.Popup
            Me.btnReset.Font = New System.Drawing.Font("Trebuchet MS",
8.25!, System.Drawing.FontStyle.Bold,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
            Me.btnReset.ForeColor =
System.Drawing.SystemColors.ControlText
            Me.btnReset.Location = New System.Drawing.Point(112, 224)
            Me.btnReset.Name = "btnReset"
            Me.btnReset.Size = New System.Drawing.Size(16, 16)
            Me.btnReset.TabIndex = 93
            Me.btnReset.UseVisualStyleBackColor = False
            '
            'Label10
            '
            Me.Label10.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
            Me.Label10.ForeColor = System.Drawing.SystemColors.Control
            Me.Label10.Location = New System.Drawing.Point(160, 224)
            Me.Label10.Name = "Label10"
            Me.Label10.Size = New System.Drawing.Size(56, 19)
```

```
        Me.Label10.TabIndex = 94
        Me.Label10.Text = "Exit"
        Me.Label10.TextAlign =
System.Drawing.ContentAlignment.MiddleRight
        '
        'btnExit
        '
        Me.btnExit.BackColor = System.Drawing.Color.Lime
        Me.btnExit.Cursor = System.Windows.Forms.Cursors.Hand
        Me.btnExit.FlatStyle = System.Windows.Forms.FlatStyle.Popup
        Me.btnExit.Font = New System.Drawing.Font("Trebuchet MS",
8.25!, System.Drawing.FontStyle.Bold,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.btnExit.ForeColor =
System.Drawing.SystemColors.ControlText
        Me.btnExit.Location = New System.Drawing.Point(232, 224)
        Me.btnExit.Name = "btnExit"
        Me.btnExit.Size = New System.Drawing.Size(16, 16)
        Me.btnExit.TabIndex = 92
        Me.btnExit.UseVisualStyleBackColor = False
        '
        'txtCurrentuser
        '
        Me.txtCurrentuser.BackColor = System.Drawing.Color.Bisque
        Me.txtCurrentuser.BorderStyle =
System.Windows.Forms.BorderStyle.None
        Me.txtCurrentuser.Font = New System.Drawing.Font("Microsoft
Sans Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.txtCurrentuser.Location = New System.Drawing.Point(120,
120)
        Me.txtCurrentuser.Name = "txtCurrentuser"
        Me.txtCurrentuser.PasswordChar =
Global.Microsoft.VisualBasic.ChrW(42)
        Me.txtCurrentuser.Size = New System.Drawing.Size(160, 14)
        Me.txtCurrentuser.TabIndex = 91
        '
        'txtTitle
        '
        Me.txtTitle.BackColor = System.Drawing.Color.Bisque
        Me.txtTitle.BorderStyle =
System.Windows.Forms.BorderStyle.None
        Me.txtTitle.CharacterCasing =
System.Windows.Forms.CharacterCasing.Lower
        Me.txtTitle.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.txtTitle.Location = New System.Drawing.Point(120, 72)
        Me.txtTitle.Name = "txtTitle"
        Me.txtTitle.Size = New System.Drawing.Size(160, 14)
        Me.txtTitle.TabIndex = 90
        '
        'Label3
        '
        Me.Label3.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.Label3.Location = New System.Drawing.Point(16, 72)
        Me.Label3.Name = "Label3"
        Me.Label3.Size = New System.Drawing.Size(80, 16)
        Me.Label3.TabIndex = 88
```

```vbnet
        Me.Label3.Text = "Title"
        Me.Label3.TextAlign =
System.Drawing.ContentAlignment.MiddleLeft
        '
        'txtDocNo
        '
        Me.txtDocNo.BackColor = System.Drawing.Color.Bisque
        Me.txtDocNo.BorderStyle =
System.Windows.Forms.BorderStyle.None
        Me.txtDocNo.CharacterCasing =
System.Windows.Forms.CharacterCasing.Lower
        Me.txtDocNo.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.txtDocNo.Location = New System.Drawing.Point(120, 16)
        Me.txtDocNo.Name = "txtDocNo"
        Me.txtDocNo.Size = New System.Drawing.Size(160, 14)
        Me.txtDocNo.TabIndex = 87
        '
        'Label1
        '
        Me.Label1.Location = New System.Drawing.Point(16, 16)
        Me.Label1.Name = "Label1"
        Me.Label1.Size = New System.Drawing.Size(96, 16)
        Me.Label1.TabIndex = 86
        Me.Label1.Text = "Document No:"
        '
        'txtDate
        '
        Me.txtDate.BackColor = System.Drawing.Color.Bisque
        Me.txtDate.BorderStyle =
System.Windows.Forms.BorderStyle.None
        Me.txtDate.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.txtDate.Location = New System.Drawing.Point(120, 168)
        Me.txtDate.Name = "txtDate"
        Me.txtDate.PasswordChar =
Global.Microsoft.VisualBasic.ChrW(42)
        Me.txtDate.Size = New System.Drawing.Size(160, 14)
        Me.txtDate.TabIndex = 96
        '
        'Label2
        '
        Me.Label2.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.Label2.Location = New System.Drawing.Point(16, 120)
        Me.Label2.Name = "Label2"
        Me.Label2.Size = New System.Drawing.Size(80, 16)
        Me.Label2.TabIndex = 97
        Me.Label2.Text = "Current User"
        Me.Label2.TextAlign =
System.Drawing.ContentAlignment.MiddleLeft
        '
        'Label5
        '
        Me.Label5.Font = New System.Drawing.Font("Microsoft Sans
Serif", 9.0!, System.Drawing.FontStyle.Regular,
System.Drawing.GraphicsUnit.Point, CType(0, Byte))
        Me.Label5.Location = New System.Drawing.Point(16, 168)
```

```
        Me.Label5.Name = "Label5"
        Me.Label5.Size = New System.Drawing.Size(80, 16)
        Me.Label5.TabIndex = 98
        Me.Label5.Text = "Date Taken"
        Me.Label5.TextAlign =
System.Drawing.ContentAlignment.MiddleLeft
        '
        'frmSearch2
        '
        Me.AutoScaleBaseSize = New System.Drawing.Size(5, 13)
        Me.BackColor = System.Drawing.Color.SteelBlue
        Me.ClientSize = New System.Drawing.Size(292, 270)
        Me.Controls.Add(Me.Label5)
        Me.Controls.Add(Me.Label2)
        Me.Controls.Add(Me.txtDate)
        Me.Controls.Add(Me.Label4)
        Me.Controls.Add(Me.btnReset)
        Me.Controls.Add(Me.Label10)
        Me.Controls.Add(Me.btnExit)
        Me.Controls.Add(Me.txtCurrentuser)
        Me.Controls.Add(Me.txtTitle)
        Me.Controls.Add(Me.Label3)
        Me.Controls.Add(Me.txtDocNo)
        Me.Controls.Add(Me.Label1)
        Me.Name = "frmSearch2"
        Me.Text = "::    D' TRAXX"
        Me.ResumeLayout(False)
        Me.PerformLayout()

    End Sub

#End Region
    Private Sub Clear()
        btnReset.Enabled = True
        txtDocNo.ResetText()
        txtTitle.ResetText()
        txtCurrentuser.ResetText()
        txtDate.ResetText()
    End Sub
    Private Sub btnReset_Click(ByVal sender As System.Object, ByVal
e As System.EventArgs) Handles btnReset.Click
        Clear()
    End Sub

    Private Sub btnExit_Click(ByVal sender As System.Object, ByVal e
As System.EventArgs) Handles btnExit.Click
        Dim frmLogin As New frmLogin
        frmLogin.ShowDialog()
    End Sub

    Private Sub frmSearch2_Load(ByVal sender As System.Object, ByVal
e As System.EventArgs) Handles MyBase.Load

    End Sub
End Class
```

Appendix B

Survey Questions

DOCUMENT TRACKING USING
RADIO FREQUENCY IDENTIFICATION (RFID)

D' TRAXX

SURVEY FORM

A. BACKGROUND OF RESPONDENT

1. Occupation   Academic ☐   Management ☐

2. Gender   Male ☐   Female ☐

3. Age   _____ years

4. Education Level   Postgraduate   ☐
                                   Degree   ☐
                                   Diploma / Certificate ☐

5. Nationality   Malaysian ☐   Others ☐
                                   (Please specify: _____)

B. DOCUMENT TRACKING

Please rate 1 – 5, with 5 as THE MOST FREQUENT.

	1	2	3	4	5
6. How often do you access any document in a week?	☐	☐	☐	☐	☐
7. Do you spend more time than required in handling the documents?	☐	☐	☐	☐	☐

8. Have you ever had any problems in locating the desired document? □ □ □ □ □

9. Have you ever lost any important document? □ □ □ □ □

Please rate 1- 5, with 5 as STRONGLY AGREE.

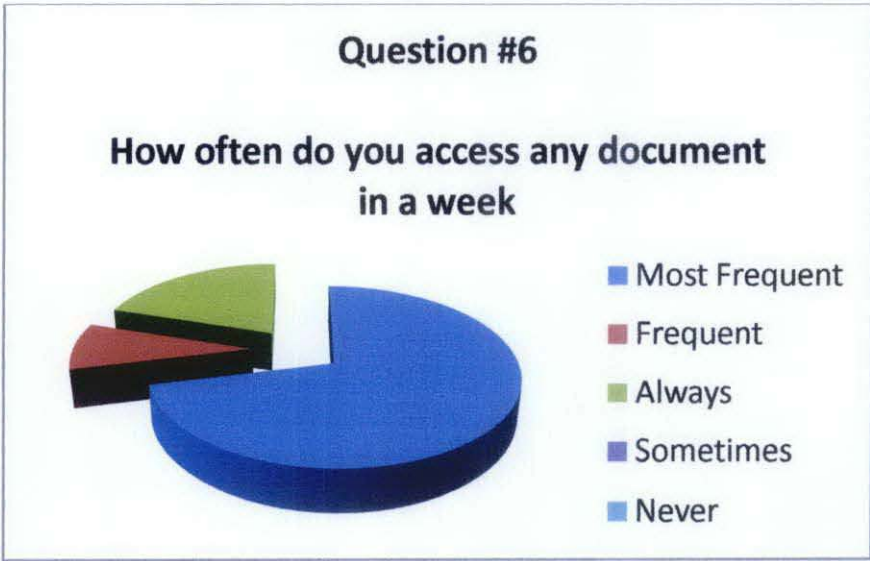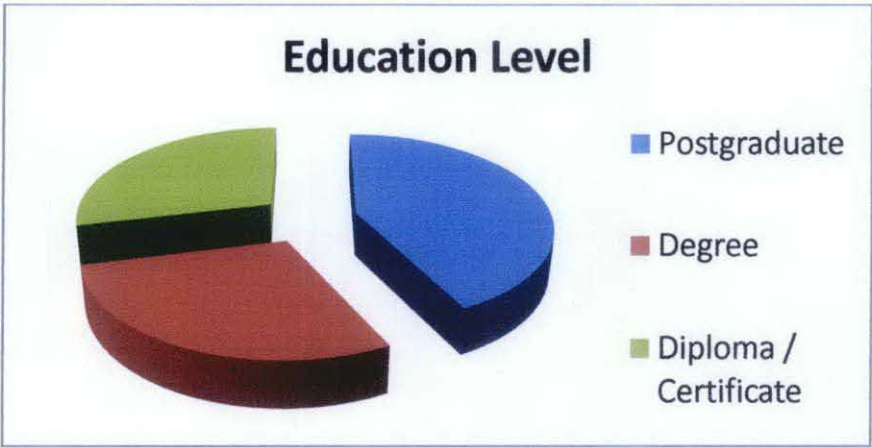|	1	2	3	4	5
10. Does documentation critical in your scope of work?	□	□	□	□	□
11. Does the existing method of documentation give you troubles?	□	□	□	□	□
12. If the latest technology in the market is able to help you in documenting efficiently, do you consider using it?	□	□	□	□	□
13. With the latest technology, budget in documentation will slightly increase, initially. Do you still want to install this?	□	□	□	□	□

C. SUGGESTION

14. How satisfied are you with the existing method of documentation (filing, manual stamping, etc.)? Any suggestion in order to improve it?
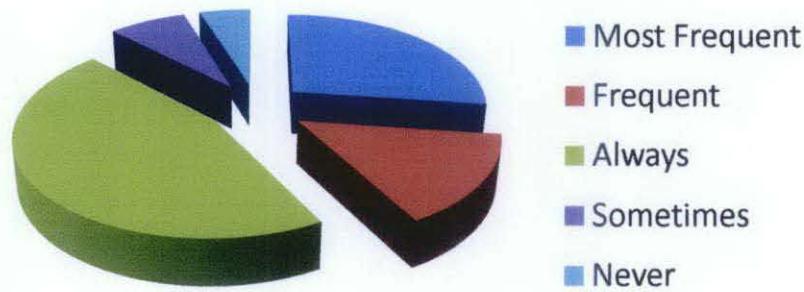
_____

_____

_____

_____

Appendix C

Survey Results

Occupation

- Academic
- Management

Education Level

- Postgraduate
- Degree
- Diploma / Certificate

Question #6

How often do you access any document in a week

- Most Frequent
- Frequent
- Always
- Sometimes
- Never

Question #7

Do you spend more time than required in handling the documents

- Most Frequent
- Frequent
- Always
- Sometimes
- Never

Question #8

Have you ever had any problems in locating the desired document

- Most Frequent
- Frequent
- Always
- Sometimes
- Never
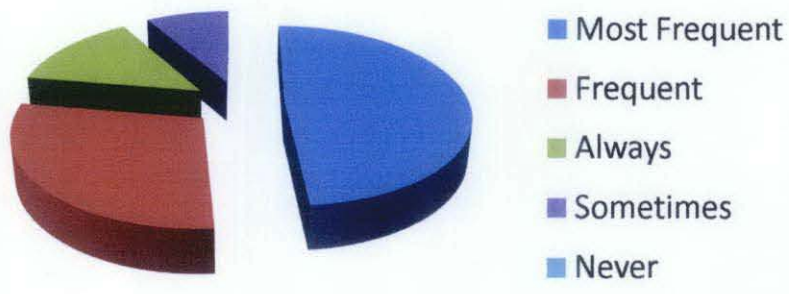
Question #9

Have you ever lost any important document

- Most Frequent
- Frequent
- Always
- Sometimes
- Never
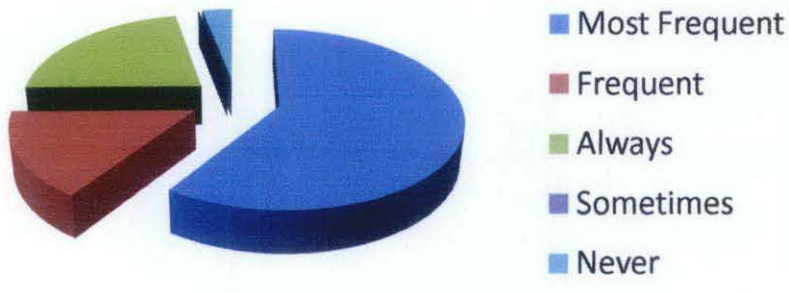
Question #10

Does documentation critical in your scope of work

- Strongly Agree
- Agree
- Fairly Agree
- Disagree

Question #11

Does the existing method of documentation give you troubles

- Strongly Agree
- Agree
- Fairly Agree
- Disagree
- Strongly Disagree
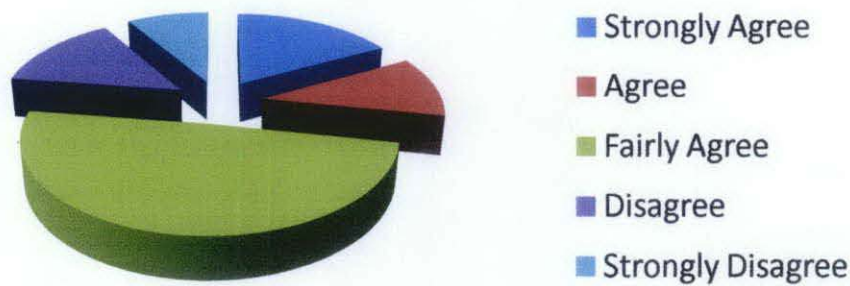
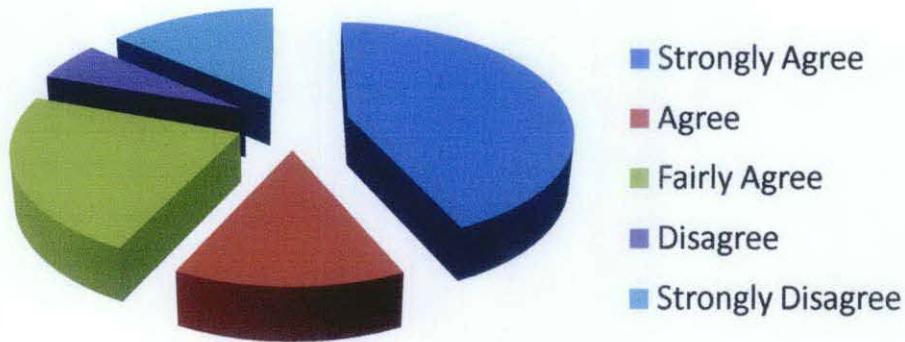## Question #12

If the latest technology in the market is able to help you in documenting efficiently, do you consider using it

- Strongly Agree
- Agree
- Fairly Agree
- Disagree
- Strongly Disagree
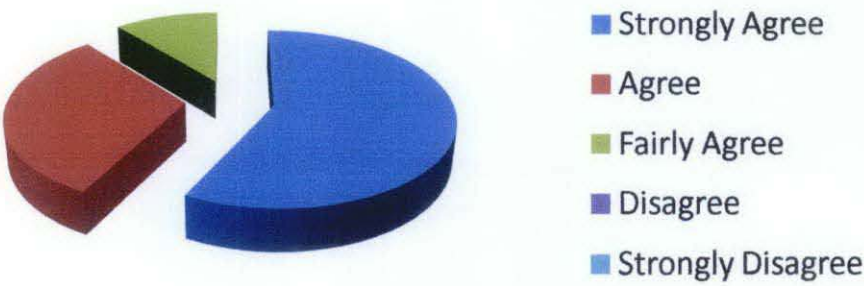
Question #13

With the latest technology, budget in documentation will slightly increase, initially. Do you still want to install this

- ■ Strongly Agree
- ■ Agree
- ■ Fairly Agree
- ■ Disagree
- ■ Strongly Disagree

Question #14

How satisfied are you with the exiting method of documentation (filing, manual stamping, etc.)? Any suggestion in order to improve it?

- Open-ended question.
- Most respondents found that the existing method of documentation is not very satisfying.
- In order to improve it, an automatic filing and documenting system can be used.