# CHAPTER 1

# INTRODUCTION

## 1.1 Background of Study

Universiti Teknologi PETRONAS (UTP) Industrial Internship Program was introduced for most of the higher institutions. This program will expose students to a real working environment and relate theoretical knowledge with applications in the industries.

However, to ensure that UTP students will be able meet employers' expectations they are required to undergo industrial internship for 7 months before entering the final year. The Industrial Internship Programme (IIP) is an important component in achieving the "well-rounded" students to produce. The objectives of this internship programme are:

- To enable students to integrate theory with practice
- To introduce students to work culture and industrial practices
- To provide opportunity for students to work with industrial practitioners
- To expose students to potential employers

UTP supervisors will visit the students at the host company twice during the industrial internship session.

Currently, UTP Internship New Assessment Process Flow has 3 stages:

i. Pre- Internship
ii. Internship
iii. Post-Internship

The first stage is Pre-Internship. Process in this stage involved students' registration and application of internship placement. Internship students need to key in their personal information in Personal Data Info (PDI) and submit resume. They can register online using

UTP student portal which is PRISM, or manually. Then, after students have applied to their preferred companies, they have to wait for placement offers from companies through Centre of student internship, mobility and adjunct lectureship (CSIML).

Next is during Internship session. At this stage, UTP supervisors will visit students at the host companies twice. For the first visit, UTP supervisor will monitor the students and have a discussion with host company supervisor. The second visit, UTP supervisor and host company supervisor will evaluate student performance and oral presentation. In this stage what students need to do is submit Project Details Forms, Training Schedule and Progress Report Forms. However, the First Industrial Visit Report, Oral Presentation Report and Students Performance Report will be submitted by UTP supervisor.

The last stage is Post-Internship. At this stage, students will submit their logbook and industrial project report to UTP supervisor through CSIML. After UTP supervisors have evaluated the report assessment, they will submit the marks to CSIML.

The department that managed and implemented the Industrial Internship Programme (IIP) is CSIML. CSIML's responsibility is to ensure the success of internship program and to enhance the relationship between UTP and the industries.

## 1.2 Problem Statement

### 1.2.1 Problem Arise

There are several problems can be identified. First is about the existing workflow system. Currently, the existing workflow system starting from student application until grading is based on manual bases. From the interview conducted, UTP supervisors need to key in information manually; normally they are using Microsoft Office Excel to key in the information and send to CSIML. This can cause problem such as data error due to human error.

Based on online survey, most of the students went to CSIML to do registration and application process. No efficient ways provide to notify students' placement status and update

the placement of internship. Currently, UTP student portal, called PRISM is no longer used because most of the students have difficulty to access PRISM.

Then, delay in getting students details. Before UTP supervisors visit their internship students, they need student's details. Therefore, UTP supervisors have to wait for CSIML give the information details. Using manual system like Microsoft Excel provides limited features such as just for entering, searching and printing data as well as too time consuming.

Next is loss of students' information like forms submission. After conducted the interview with CSIML staff, they mention that if CSIML didn't received any submission forms from students or host company supervisor they assume that both of them didn't submit the forms needed. Sometimes both of them already submitted the forms but maybe because of the connection problem CSIML didn't received it and students or host company supervisors are not aware about it. CSIML has to remind them and currently, telephone and email are the main methods of communication which arise many problems such as have to update to all students individually and also in high cost of communications.

Then, for students their main problem is constraint to manage logbook. Currently, internship logbook is a hard copy. Internship students need to bring every time to take host company signature and stamp.

Lastly, high cost of printing the logbook and individual evaluation form book. From the interview, CSIML mentioned that the cost for printing both is around RM30 per student. Maybe after implement this system CSIML can reduce the printing cost.

### 1.2.2 Proposed Solution

In order to address this project, the propose solution is to build an online web-based workflow management system for CSIML. This system will be used by 4 parties which are CSIML, UTP supervisors, internship students and host company supervisors.

The purposes of using this system are:

- Allow students to do registration and application processes also submit resume by online
- To helps CSIML in terms of sorting students' internship placement
- Allow students to check status of placement and update the internship placement by online
- Allow students to do online forms submission and online weekly reports (logbook)
- Allow UTP supervisors and host company supervisors to do assessment online

A lot of benefits can be gained. One of them are easy for students to do registration and application processes online and for CSIML, easy for them to do sorting and endorsement of students' application. During application process, students are allowed to choose their preferred company for internship but they are required to choose at least two placements from list given in the system. It is because, 6 weeks after application process if students didn't get any placement yet, CSIML will choose one of the companies. This is the way to ensure that students have placement before the dateline.

Then, by using this system students are easy to do and manage their logbook. They no longer need to bring the logbook everyday and could save time, also could avoid any missing information that has been submitted. Any forms submissions are well-organized because the forms will be submitted to CSIML by online. To ensure that CSIML received the forms, CSIML will receive notification through email to inform that they are receive forms from students or both supervisors.

Lastly, CSIML and UTP supervisors can keep track with internship students. This online web-based system could be one of the platforms to communicate with internship students, UTP supervisors and host company supervisors. UTP supervisor may know their internship students' progress. This system also could save papers, money and time. Maybe after implement this online system, CSIML no longer need to print out the logbook but only the evaluation form book. This system will help to centralize and manage the information securely.

## 1.3 Objective

The objectives consist of the benefits that a system expects to achieve as a result of spending time and effort to complete a project.

For this project, the objectives can be divided into three categories:

i. To analyze critical parts
ii. To design system architectures
iii. To develop workflow management system

The first category is to analyze the critical parts of developing the system. The most critical parts have to develop are login function for internship students, UTP supervisors and host company supervisors, web transactions and notification through email.

The second category is to design the systems architecture for the system. Systems architecture is the conceptual models that define the structure, behaviour and views of the system. The relationship between them will work together to implement the overall system.

The last category is to develop workflow management system that automates the existing system based on manual bases and to avoid any information missing and communication problems.

## 1.4 Scope of Study

Scope can be an object or theory process or activity. It also can define the specific boundaries or limitation where the object, knowledge, instruction or outcome of the activity is found.

These studies aimed to develop an internship workflow system based on online system that automates the existing workflow system working in manual bases.

### 1.4.1 Significant of the study

These studies are intended to automate the existing internship workflow system by developing an online system and will be implemented by UTP industrial internship programme. This system will be used by four parties which are CSIML, internship students, UTP supervisors and host company supervisors. The existing workflow system starting from student application until grading is working in manually. Number of problems can be identified and cause weakness in the system as well as too time consuming. This system is designed to help centralize data and give a lot of benefits for users to view, store, and manage the information. CSIML and UTP supervisor also can keep track on internship student progress.

### 1.4.2 Parties Involve Job Scope

| No. | Parties Involve | Job scope |
|---|---|---|
| 1 | Centre of Student Internship, Mobility and Adjunct Lectureship (CSIML) | • Received internship students information details<br>• Sorted and endorsed students application for host company<br>• Inform internship placements offer to students<br>• Received forms and evaluation forms submission |
| 2 | Internship Students | • Login to the system<br>• Key in Personal Data Info (PDI) and upload resume<br>• Choose internship placements from list given in the system<br>• Received internship placement offer<br>• Update internship placement and host company supervisors details<br>• Do weekly report, Training schedule and Project Details online<br>• Submit forms needed to CSIML or host company supervisors for verification and evaluation purpose |
| 3 | UTP Supervisors | • Login to the system<br>• View internship students information details<br>• View internship students progress<br>• Received submission evaluation forms from host company supervisors<br>• Do assessment for internship students by online |

| | | |
|---|---|---|
| | | • Submit evaluation assessment to CSIML |
| 4 | Host Company Supervisors | • Login to the system<br>• Verify the students application for internship placements<br>• Evaluate forms submission from internship students<br>• Verify weekly reports and evaluate<br>• Submit evaluation forms to CSIML or UTP supervisors. |

**Table 1: Parties involve Job Scope**

### 1.4.3 Scope and Delimitation of the Study

In order to complete this system, several scope of study needs to be achieved. The major scopes are to get clearly information about existing workflow system, in terms of handling the students' information and also sort and endorse students' application.

This study was delimited to registration process, internship placements application and confirmation, online forms and logbook submission and grading process; aimed to improve the existing system.

## 1.5 Feasibility Study

Feasibility study is an analysis of the viability idea. The studies provide thorough analysis of the system. The outcome of the feasibility studies will indicate whether can proceed or not to develop the system.

### 1.5.1 Technical Feasibility

The tools that will use for this system are:

- HTML as the main development platform. This HTML will connected with PHP language
- MySQL as database platform
- Another language such as CSS and javaScript

### 1.5.2 Operational Feasibility

This feasibility study mainly concerned whether this system will be used if it is developed and implemented. If this system meets the requirements and needs of Student Industrial Internship Programme, it can be proposed to them to use for the next internship programme.

### 1.5.3 Schedule Feasibility

The development of this system is going to be completed within the allowed time frame which is 4 months.

# CHAPTER 2
# LITERATURE REVIEW

## 2.1 Overview

A literature review aims to review the critical points of current knowledge to a particular topic. It is an evaluation, to explain how the previous system integrates into the proposed system. All sides of an argument should be clearly explained. From this Studies, it can helps readers understands the structure of the problems. It can also place the research in a historical context, showing that the researcher is familiar with the most recent innovations in the field.

## 2.2 Related Works

### 2.2.1 Workflow Management System

Workflow is a concept or sequence of connected steps related to redesign and automate the existing system. According to Sheth (1995), a workflow may describe process tasks for understanding, evaluating and redesigned the process. Workflows may catch information process tasks that describe the functionality requirements process for information system and human skills.

Workflow management system can offer an organization a method to implement a better management. With the development of the technology nowadays and more furious commercial competition, an organization needs an integrated solution. The traditional workflow management system doesn't meet the requirement of the modem work style.

According to Wang Tao, Wu Genfeng and Hang Liqin (2001), the workflow technology provides advanced techniques for organization to realize the manage goal well. Xiufen Fu, Junfeng Hu, Shaohua Teng, Boxing Chen and Changyao Chen (2007) also said, a workflow involved a set of actions and sequences of each action; included also the start-up and termination condition of the process and action and also the description of each action.

### 2.2.2 Internship Workflow Management System

Internship Workflow Management System is design to automate the existing system which is working in manually. In this system, students are allowed to do registration and application placement online, helping CSIML in terms of sorting and endorse students application, check internship placement, submission forms and logbook by online, benefit for both supervisors to do evaluation and assessment online. Numbers of problem can be identified and can cause weakness in the system. In a research article by Aliza Bt. Sarlan, Wan Fatimah Bt Wan Ahmad and Dismas Bismo (2008), they said, many problems arise since all processes are still been done manually, such as data missing and redundancy, delay in grading process, communication problems and most crucial is student monitoring. According to Nie Gang (2008), Traditional Workflow Management Systems is hard to meet the requirements of the dynamic, flexible modern business process.

### 2.2.3 Internship Placement Application

It is an uphill task for students to decide which internship offer to accept because of lack of knowledge about the potential company and the unavailability of information about the job offers. In this system we provide also list of the companies which is recommended by CSIML for student choose at least two placements from list given in the system. This is the way to ensure that students have placement before the dateline.

The registration and submission resume process can be done by online. From survey conducted, most of the students prefer submit online. According to Hsu (1998) and Wai Chiu (2010), any work based on paper-pencil bases is a common practise and required a lot of manpower to process, electronic submission is also becoming important due to growing popularity of the internet. Internship Management System takes the students as the core develops the comprehensive mechanism of network management and controls students' internship programs conveniently.

### 2.2.4 Document Management System

Any forms submissions are well-organized. Using manual method, CSIML and UTP supervisors need to key in the information in Microsoft Excel. It can cause data error due to human error and also too time consuming. It is part of managing the documents. Amir Mujahid Bin Sudarno (2007) said that, document management can be simply defined as process of collecting, organizing, categorizing and structuring information. So that, users can save, retrieved, published, updated and re-purposed in any way. Baban and Mokhtar (2010) said, nowadays, no one wants spent time seating beside computer just for looking for a document. Sometimes people forget where they did save documents or maybe under wrong name or having duplicated and many other mistakes may happen. So it is necessary to find a way to avoid time consuming. Xie Lin-lin, Le Yun, Li Yong-kui and Ning Yan (2009) said, working with large group of peoples add too complexity in implementation process. This may cause disperse and disorder in managing documents.

Some scholars become proposed some web-based workflow system. The work of Aliza Bt. Sarlan, Wan Fatimah Bt Wan Ahmad and Dismas Bismo (2008) provide eligibility checking, registration, student-lecturer assignment, visit schedule, online-logbook submission and monitoring as well as grade book of industrial internship program. These are unpractical because it required all workflow servers which are should be based on Web and lack of reusability. The processes are unable to allow the smooth information exchange and cooperation. Therefore, the proposed system that will be designed will provide the whole internship process only such as registration and application purpose and also resume forms and logbook submission and also included the notification method; via email.

### 2.2.5 Email Notification

Notification is an important feature in Internet applications. Nowadays, there are many platforms providing real-time notification and session based, it can be used as notification client to receive message.

This method will be used when any submission information likes forms and logbook already submits to CSIML or both supervisors. Parties involve will receive notification via email to inform them the status of submission and so on. In a research article by Alamo, Sarkar and Wong (2008) said that, giving notifications in a timely manner is an important service that should provide. This can be one of the communication methods of group of peoples concern with any updating information. Dewan and McEuen (2007) said when documents are shared or submit most users concern about the status or updating information of document submission. So that, notifications services is important. There are service can provide automatically sends notifications to the users.

The need for scheduling appears wherever the number of users in any system exceeds the number of its resources. This can be applied to any educational or training-delivery institution. Any shared or resources are used, it becomes necessary to have a scheduling system to manage students and monitor their utilization in training period.

Overall, this system can be one of the methods to improve and promote internship student's hand-on ability during training period. In a research by Ge Yu, Libin Hong and Lei Sheng (2010), according to current issues of experimental teaching, a Web-based Examination and evaluation system is designed and implemented. This system includes four sub-systems: proposition, examination, monitoring and evaluation system, it greatly improves the issues on experimental teaching; it's also a powerful platform that enhances students' interests, improve ability of student's thinking and hands-on.

# CHAPTER 3

# METHODOLOGY

## 3.1 Overview

Methodology is a general guideline of entire project life cycle step-by-step. A methodology informs what should do, to manage the system from start to finish. It will describe each step in the project life cycle in depth. So that, it will helps to complete tasks faster than before.

## 3.2 System Development Life Cycle (SDLC) Methodology

Systems Development Life Cycle (SDLC) can be defined as the whole process of developing a system or software to meet certain requirements. It includes many activities starting from understanding why and how the system should be built, study the project feasibility, analyzing problems, choosing the system design and architectures, implement and testing the system and up to deliver the system as product to the user. The process in SDLC is done through several development phases. Each phase wills continues and refines what have done in previous phase. Commonly the development phases in SDLC are:

- **Planning:** The process of understanding why the system should be built and defining its requirements. Including feasibility study from several different perspectives, technical, economic and organization aspects.
- **Analysis:** Include activities such as identify and analyze the problems that may arise in the future regarding the system. The deliverable of this phase will show how the system will be built and guide the developers' works.
- **Design:** System analysis will drive to design decisions which to determine how the system operates in terms of process, data, hardware, network infrastructures, user interface and other factors in the system environment.

- **Implementation:** The most resource, cost and time consuming phase of all; where the system is actually built and tested then finally installed. Its include activities such as user training and system maintenance.

Many methodologies have been developed and introduced in order to implement SDLC. Although each method follows different technique and steps, at last the outcome must go into the same development phases described above.

### 3.2.1 Throw-away Prototyping

Throw-away prototyping is quite similar to prototyping method that is also develops a prototype but this throw-away prototype is as presentational only. The purpose is to help users imagine that the system being built.

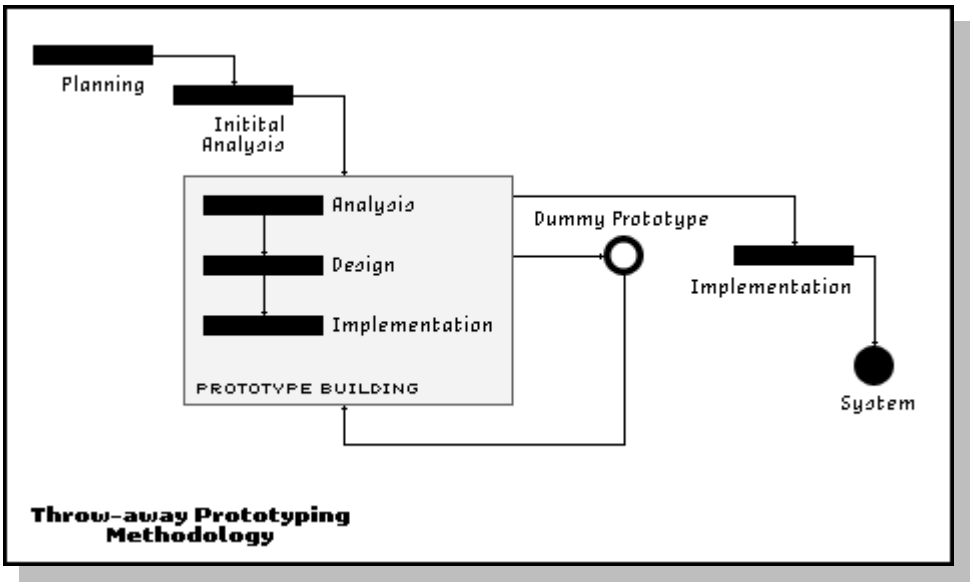



**Figure 1: Throw-away prototyping**

In this project, the Analysis, Design and Implementation phase will continuously built until it can visualize the real working system. The next step will be implementing the real system.

This throw-away prototype also called dummy prototype. Before the developers start working on the first dummy prototype the best thing to do is initialize the analysis parts as the dummy needs to contain enough details about the real system.

This method doesn't deliver incomplete systems within the project timeline like prototyping method but at the end it will be delivered the complete system very quickly. Building dummies is considered easier and less time-consuming rather than building working prototypes. It is important to developers ensure that this SDLC meets users' requirements. Due to time constraint, the development process is needed to complete as fast as possible.

### 3.3 Requirement Gathering

The purpose of this phase is to study the internship workflow management system. The information and study of internship workflow management system have been done. The requirement gathering methods have been used are:

- Interview
- Online Survey

The first method is interview. The main target person for the interview is CSIML staff. The purposes are to know clearly the existing internship workflow system starting from Pre-Internship, during Internship until Post-Internship phase and to identify problem arise using the existing system and discuss with them the proposed solution to solve these problems.

The second method is online survey. The main target groups are internship students, UTP supervisors and host company supervisors. The purpose of doing this survey is to collect information regarding internship workflow system in terms of their convenient and concern of using the existing system and suggestions to develop online system.

These methods were selected to obtain as much information as can in order to develop online system.

### 3.4 System Analysis

After requirement gathering processes have been successfully done, the next phase is the analytical parts where the acquired information will be analyzed. In this phase, all possible

problems need to analyze in order to ensure that the internship workflow management system meet the requirements.

This stage is mostly being done and completed during the 1st phase of this project, which is referred to as FYP1. In this stage, the problem statement has been analyzed to have a better understanding of the problem encountered. Apart from that, the requirements for the Internship Workflow Management System are gathered in order to understand the basic functions and performance and system prototype that will be built in this project. The system's requirements and objectives are established by gathering information with system users.

### 3.5 System Design

Once all the necessary data and information being gathered, the basic design architecture of the system is develop. The system architecture will need to be established to identify and describe the fundamental system abstractions and their functionality.

In system design phase, the web-based, database and notification through email need to be designed based on the UML diagram that has been studied in system analysis phase. The process, input and output of the system need to determine. The crucial part is the system needs to be designed based on user requirements and needs. The development of internship workflow management system will be used several programming tools like HTML connecting with PHP and MySQL.

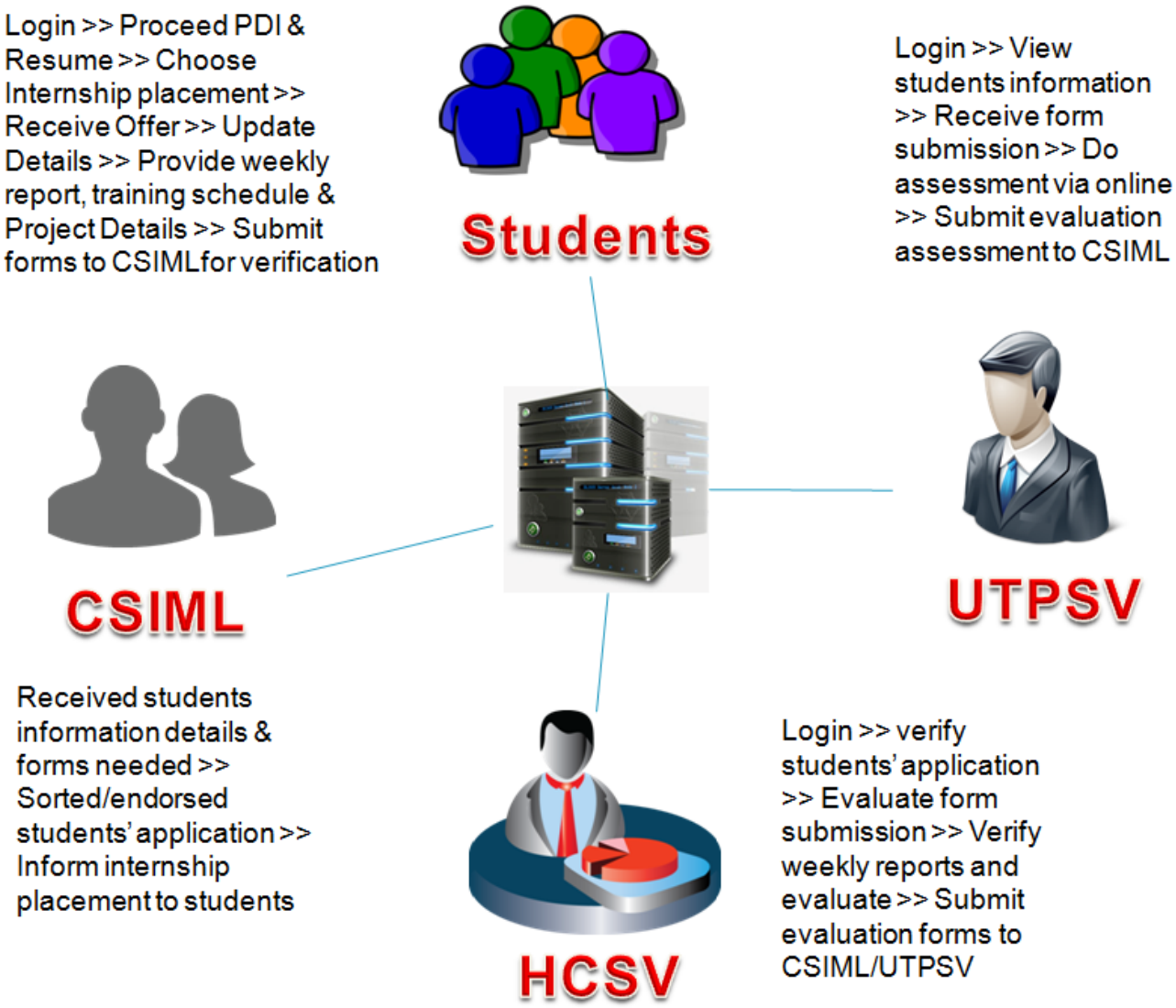



**Figure 2: System Architecture**

After the system architecture is being established and designed, the next step is to develop the system. This phase consists of 2 main categories which are building and refining. These 2 steps is performed in develop system, where its starts with building the system. The development of the system began and is performed part by part. Each completed part is then demonstrated to check for its functionality. If there are any requirements or new functionality being identified, the system will be refine, where the building process will start again from where it has initially completed. Further explanation on these 3 parts is described below.

### 3.5.1 Prototyping Cycle

#### 3.5.1.1 Building

This is the part where the interface of 2 main parts of the system is being developed. These parts are referred to as “Main Page” and “Industrial Internship” respectively. The “Main Page” is the page that CSIML will update the announcement for internship purpose. The second part is “Industrial Internship” wills represents the page where the input will be entered by the users. Once the interface of window for each part completed, the database is then develop.

**Main Page and Industrial Internship Category**

The main page is the page that will appear when the program is run by the user. In this page, there is no input needed to be entered. The intention of this page is just to introduce and welcome the user when using the system and for CSIML to update announcement for internship students. The main function of this page is to redirect the user to other part of the system on which they intended to perform any transaction. **Figure 3** shows the main component of the “Main Page”.

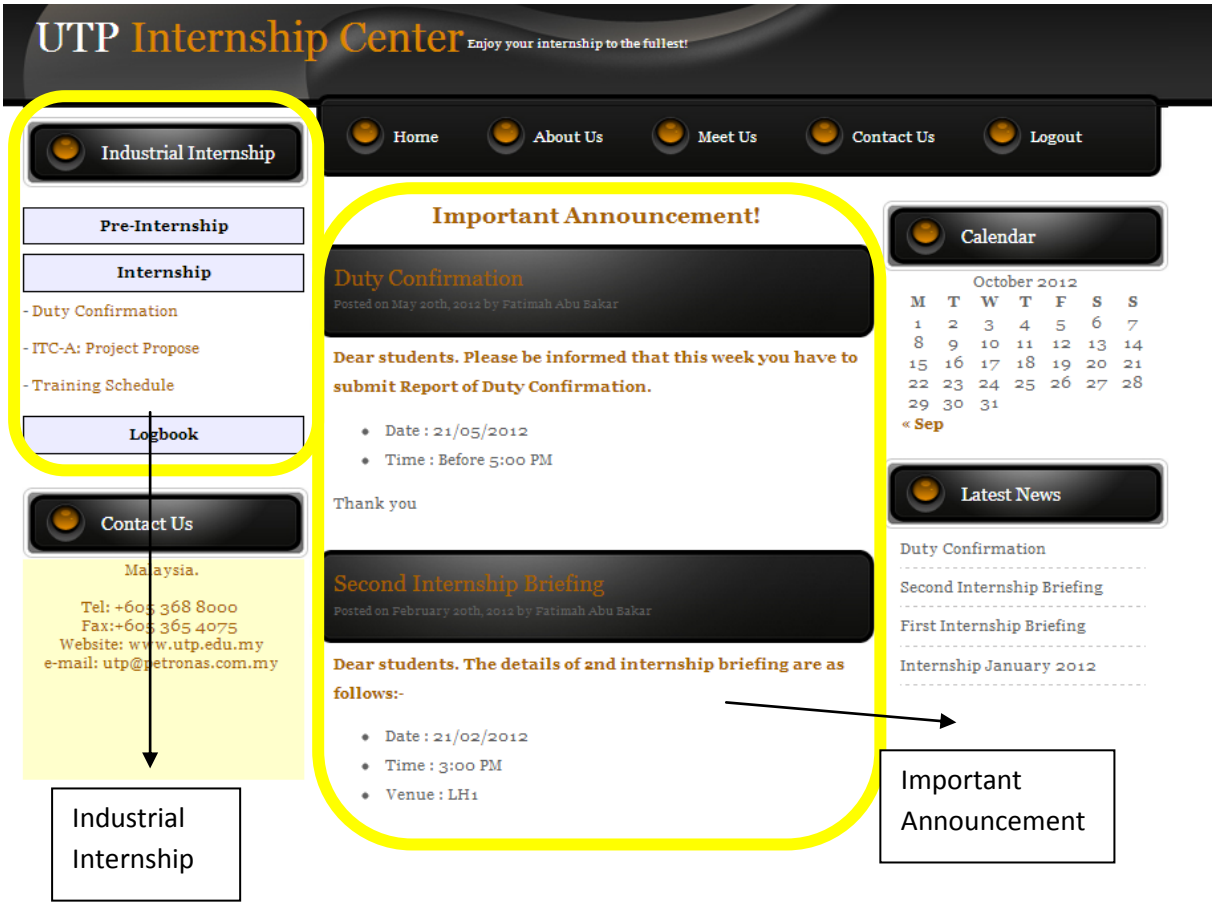



**Figure 3: Main Page**

"Industrial Internship" category is the input page in the system which its function is for user to enter the input. Starting from registration process until submit logbook and forms needed.

#### 3.5.1.2 Refining

The changes and modification required have made the system to undergo several modification processes. This process is referred to as the refinement process where the system components, interfaces and database are being modified. Table 2 shows the modification that is being made to the system, page by page.

| System Page | Modification | Remarks |
|---|---|---|
| Industrial Internship Category | Add the dropdown menu function for user to select | One of the main part |
| Forms and logbook | Add extra features – Auto save document. This is as safety incase laptop or PC having problems like auto shutdown or hang | - |

**Table 2: Modification being made to the system**

### 3.6 Testing

The completed subpages of the system will be tested individually before being integrate to form the complete system. In this stage, all subpages are tested for several kind of error testing as described in Table 3 below. The testing process is also taking place in database if the system to ensure that each page of the system is properly connected to the database. As for the forms and logbook part at the "Industrial Internship" category, all the information input by the user in this page must be able to be stored inside its respective database.

| Test No | Type of Error Handling Test | Purpose | Status |
|---|---|---|---|
| 1 | Invalid Data Type Error Handling | To make sure that the system do not proceed with execution and notify user when the input data type is wrong. | Passed |
| 2 | Data Storing in the system database | All the data entered by user should be stored in the database and the data shall not miss when the data is checked in the database. | Passed |
| 3 | Empty input error handling | The system will not proceed with execution whenever it required the input data, if there is no input being entered. | Passed |

**Table 3: Testing for error handling**

### 3.7 System Implementation

After all the testing performed is completed and passed, the system is ready for the implementation. At this phase, this system will be developed based on user requirements and needs which are involved UTP supervisors and students to do the testing part. Due to limited time available, the user testing was done for the students' part only. There are 12 students involved in this user testing and most of them are students who will be going internship next semester

The Internship Workflow Management System has received a positive response and will be considered to be use soon. This is the final phase of the system development and hence, the system is expected to be fully functioning as it intended for.

# CHAPTER 4

# RESULT AND DISCUSSION

The Internship Workflow Management System performed as expected. There are 4 sections in this chapter, firstly is the result from interview conducted; secondly the result from survey conducted; thirdly is process flow diagram and lastly is sample of result. Each of these sections will be discussed and justified.

## Result from Interview Conducted

Data was gathered after conducted an interview with CSIML staff and did online survey with students and both supervisors, then gathered data was analyzed and discussed.

### 4.1 Preliminary Result: Existing Internship Process

The existing workflow process based on interview conducted with CSIML staff. The workflow processes are from Pre-Internship until Post-Internship phase.

#### 4.1.1 Pre- Internship Phase

Pre-Internship phase is about application process for internship placement. Parties involve are CSIML and internship students. Students who are meet the internship requirements may proceed with the registration and application process.

Students are allowed to apply their preferred companies or can apply from list given by CSIML. For those who apply through list given, CSIML will sort and endorsed the application before submit to companies. If companies approve the application, CSIML will announce the placement offered to students. Then, students will update host company details.

### 4.1.2 During Internship and Post-Internship Phase

These phase involved submission forms and logbook process flow. Parties involved are CSIML, internship students, UTP supervisors and host company supervisors.

One week after report of duty, internship students need to key in host company supervisors' details such as supervisors' name, contact number, email and supervisors' position by sending email to CSIML itself and as we know, UTP Internship PRISM is no longer used.

Then, internship students need to submit Training Schedule and Project Details Form (ITC-A) to CSIML while Progress Report Form (ITC-C) host company supervisors will do the assessment and submit to CSIML.

For First Visit Evaluation Form (ITC-B), Oral Presentation Form (ITC-D), Students Performance Evaluation Form (ITC-E), Final Project Report Form (ITC-F) and logbooks assessment will be submitted by UTP supervisors to CSIML.

### 4.1.3 Existing Process: Swimlane Diagram Overview

a) Figure 4 shows process involve during pre-internship phase. Student need to register Personal Data Information (PDI), submit resume and apply Host Company.

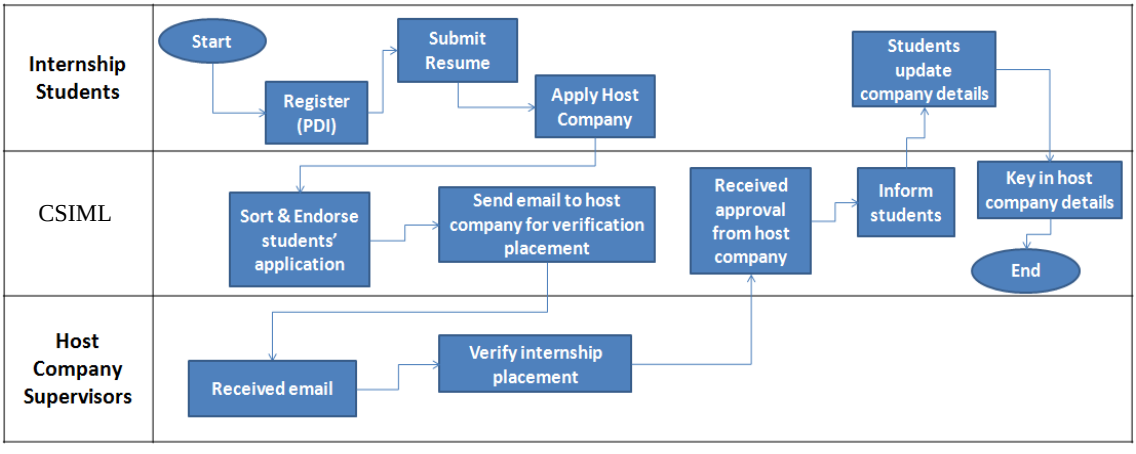



**Figure 4: pre-internship**

b) Figure 5 shows process involves in submitting forms needed. Training Schedule forms need Host Company Supervisor to approve first then if no correction, HCSV will submit the form to CSIML.

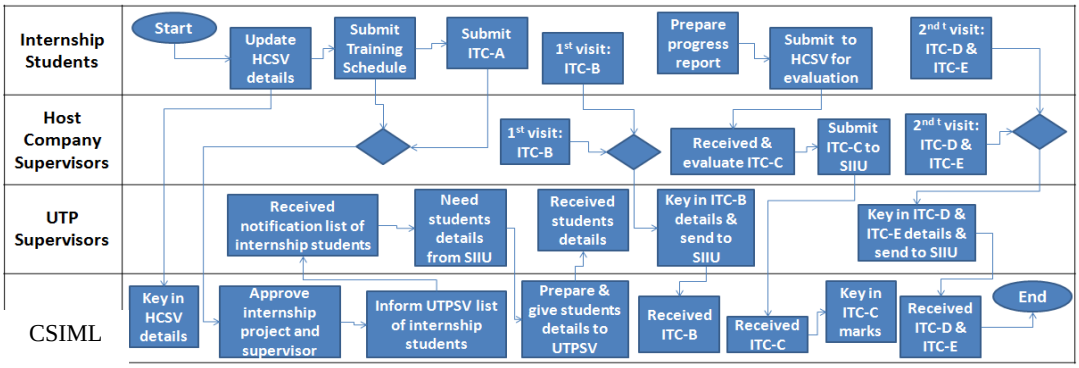



**Figure 5: during internship – forms submission**

c) Figure 6 shows process involves in post internship phase. At this phase students need to update their logbook and prepare final project report then submit to CSIML, before this known as SIIU.

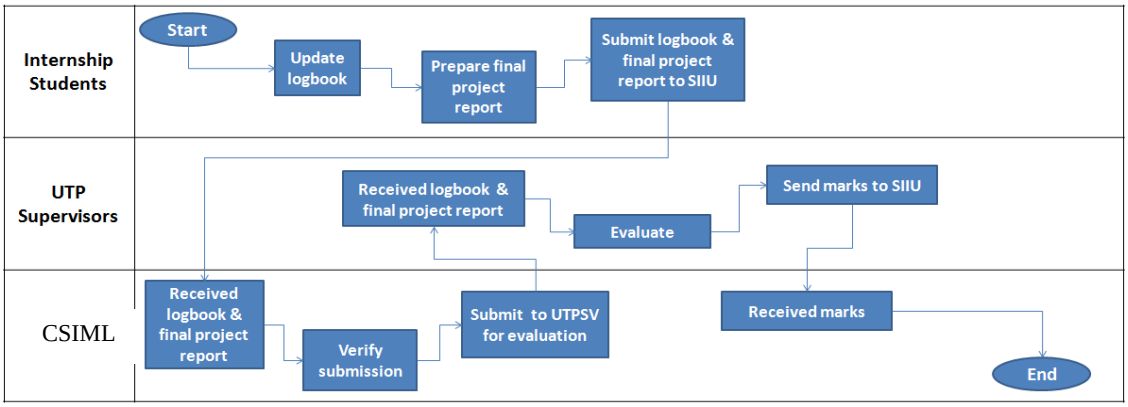



**Figure 6: post-internship**

d) Figure 7 shows process involve during logbook submission. Every two weeks students need to get HCSV signature and stamps.

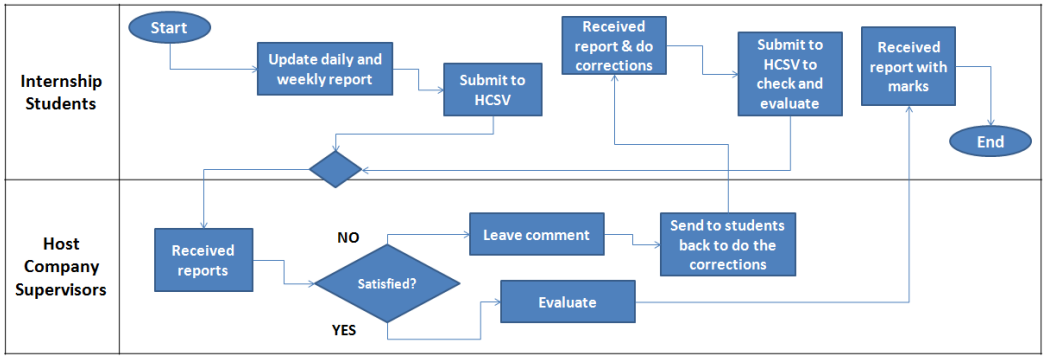



**Figure 7: logbook submission**

## 4.2 Preliminary Result: To-be Workflow

Based on interview conducted, after identify the problems below are the proposed workflows that will be used in this system.

### 4.2.1 Pre-Internship Phase

Students who are meet the internship requirements may proceed with the registration and application process. After login, students just need to key in their personal details and upload their resume. Students are able to update their personal details afterwards.

Then, students are required to choose at least 2 internship placements; choose from list given in the system. CSIML will email the students' information details to companies chosen for verification. However, students are allowed to apply their preferred companies. Once the host company verified the internship application through CSIML, students will be notified via email to approve or deny the company. Students need to update the company details such as company name, address and contact number. Students and CSIML will receive notification via email once the placement has been approved.

### 4.2.2 During Internship and Post-Internship Phase

One week after report of duty, internship students need to key in host company supervisors' details such as supervisors' name, contact number, email and supervisors' position..

For logbook, the daily reports internship students will do online. They are allowed to save and update the reports. Every 2 weeks, students will submit the reports to host company supervisors for verification and evaluation purpose. The host company supervisors will be notified via email whether to proceed or edit. If the information not meets the requirements, host company supervisor will give comment and send back to students to do the correction. If proceed, host company supervisors will submit the evaluation form to UTP supervisors. UTP supervisors received notification via email to inform that weekly reports evaluation form already submitted.

The Training Schedule and Project Details Form (ITC-A), internship students will key in online. Then, these forms will be submitted to host company supervisors for verification. CSIML will receive notification via email to inform that the forms already submitted.

The First Visit Evaluation Form (ITC-B), Oral Presentation Form (ITC-D), Students Performance Evaluation Form (ITC-E), both supervisors can do evaluation by online as well as Final Project Report Form (ITC-F) and logbooks assessment; UTP supervisors will submit to CSIML. CSIML received notification email to inform that the forms already submitted.

### 4.2.3 Proposed To-be Workflow: Swimlane Diagram Overview

a) Figure 8 shows process involve during pre-internship phase. Student need to register Personal Data Information (PDI), submit resume and apply Host Company.

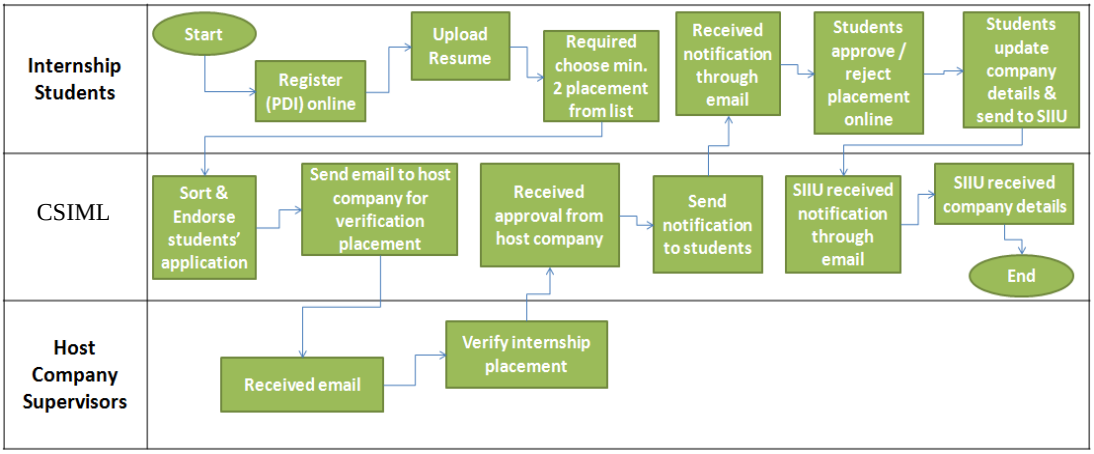



**Figure 8: pre-internship registration and application**

b) Figure 9 shows process involve during internship phase. Student need to submit duty confirmation form, training schedule and project topic confirmation.

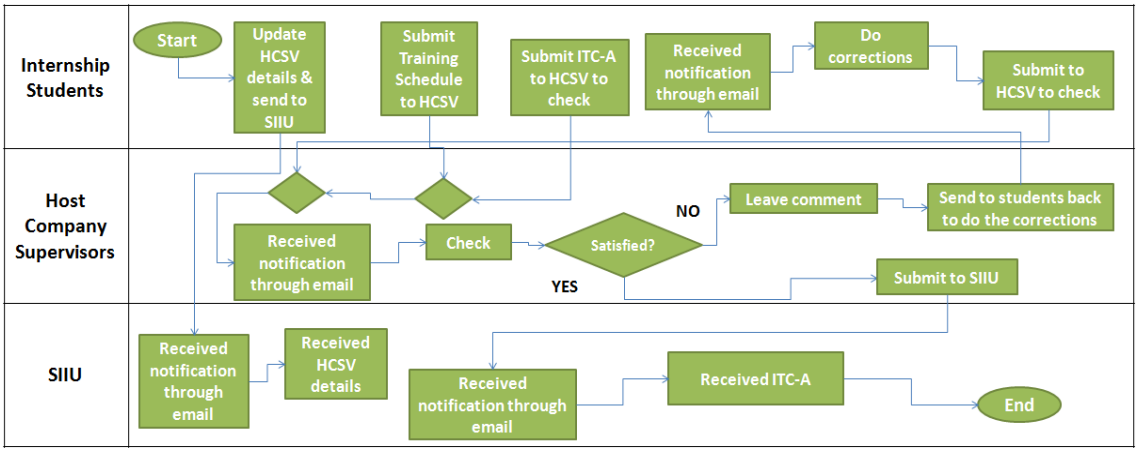



**Figure 9: during internship-update HCSV details and submission ITC-A forms**

c) Figure 10 and 11 shows processes involve in submitting forms needed. UTPSV will evaluate students by online the direct submit to CSIML.

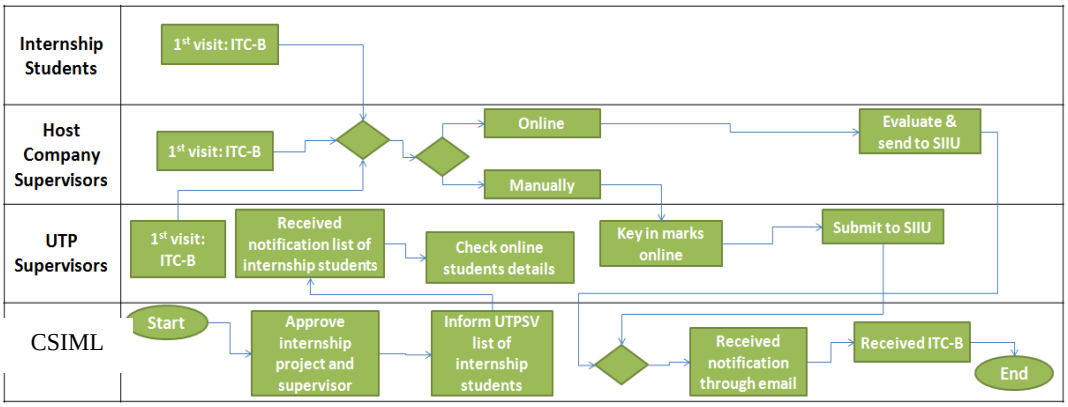



**Figure 10: ITC-B forms submission**

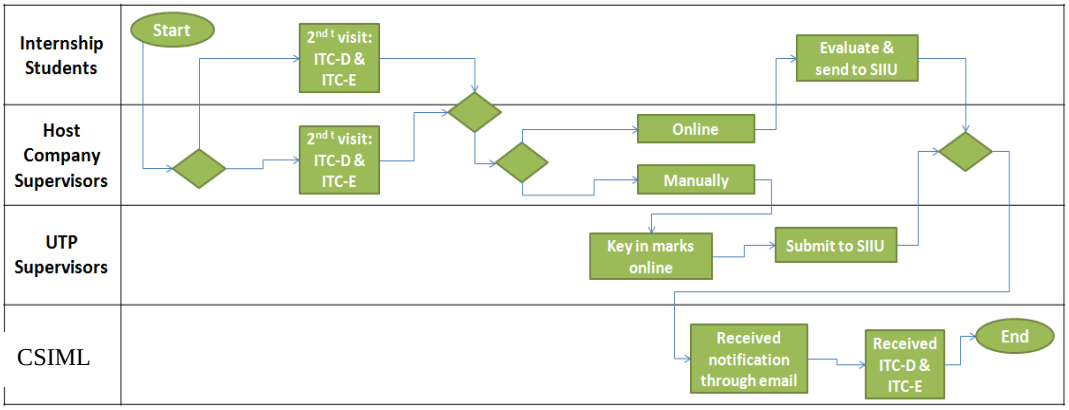



**Figure 11: Second visit**

d) Figure 12 shows process involve in submitting progress report to HCSV to evaluate. Students need to upload the reports and ask HCSV to evaluate. Then HCSV will submit the form to CSIML.

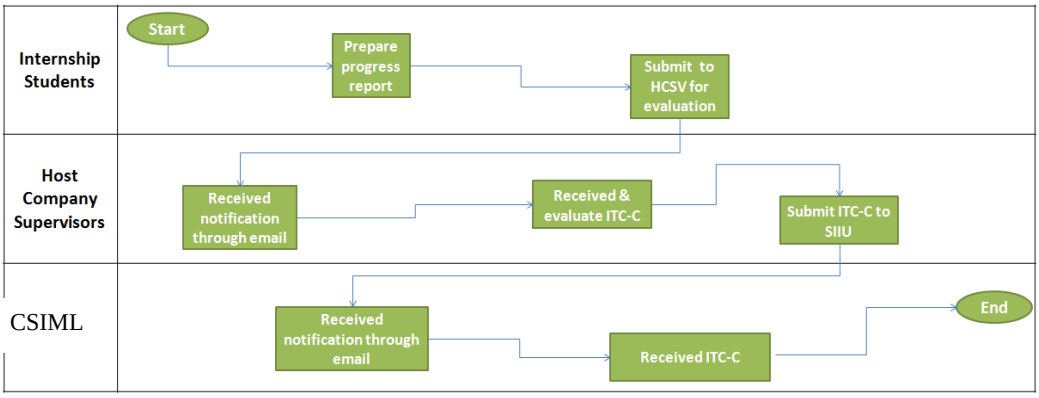



**Figure 12: Progress report**

e) Figure 13, 14 and 15 show processes involve during logbook submission. Every two weeks students need to get HCSV signature and stamps.

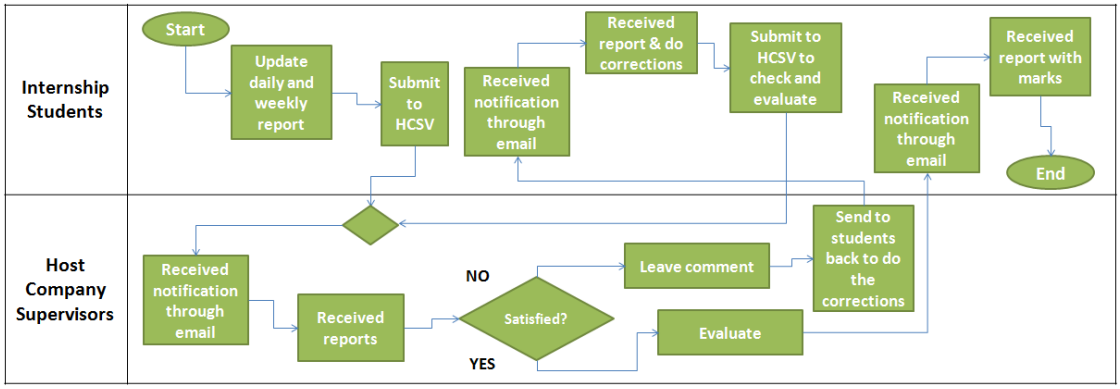



**Figure 13: logbook**

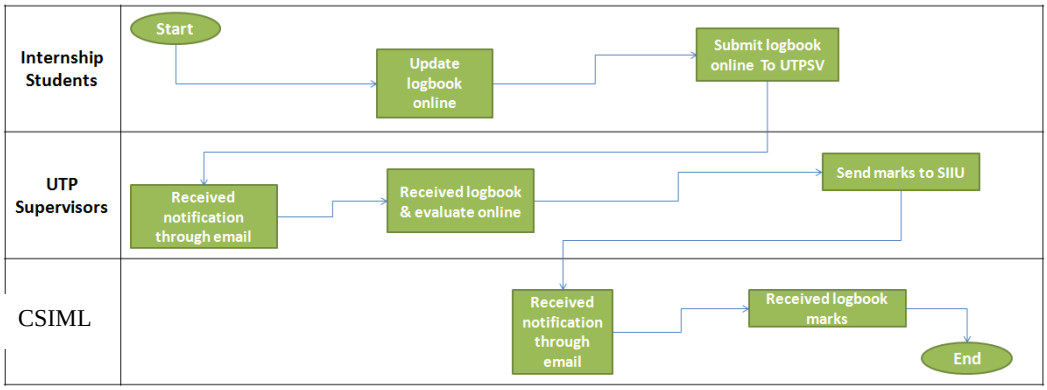



**Figure 14: update logbook**

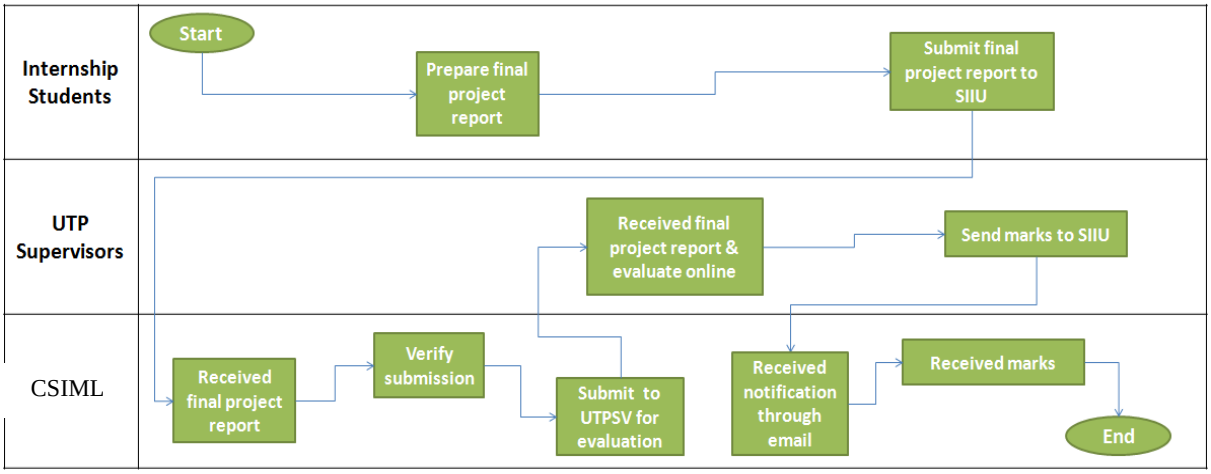


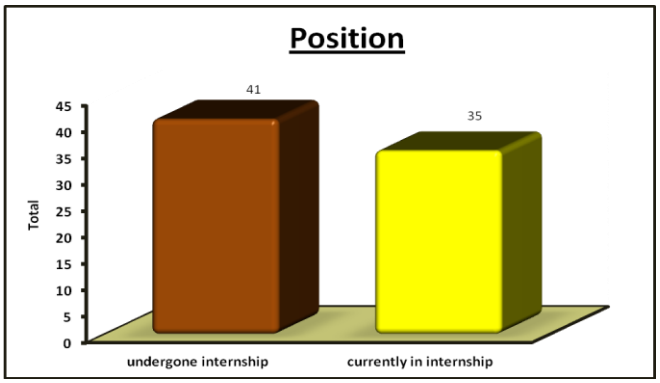

**Figure 15: final project report**

## Result from Online Survey

### 4.3 Students

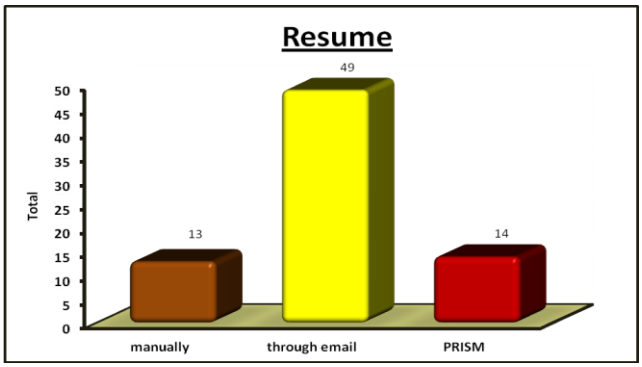
As part of this process, the current system will be analysed. Here is the listed result of online survey; 76 correspondents have replied back. These results represent on question based and already calculate the percentage of each answer.

#### Q1. State your position?



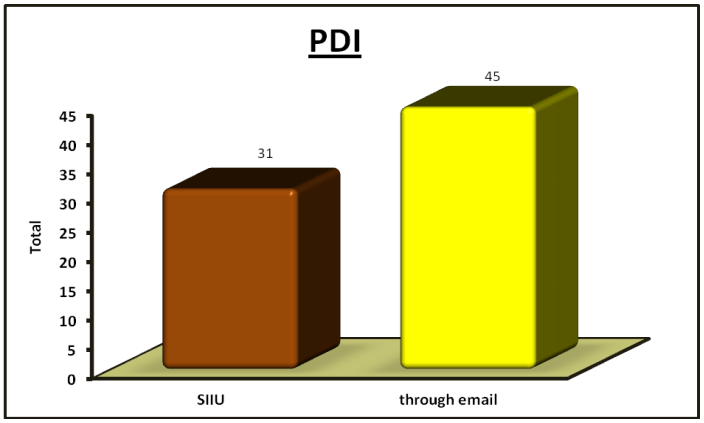

- **53.9%** of the correspondents (41 respondents) are undergone internship
- **46.1%** of the correspondents (35 respondents) are currently in internship

## Q2. How did you submit your resume to CSIML?



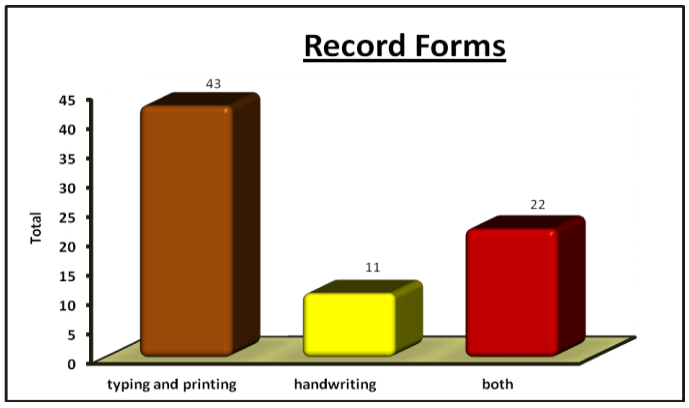

- **17.1%** of the correspondents (13 respondents) are submit manually
- **64.5%** of the correspondents (49 respondents) are submit through email
- **18.4%** of the correspondents (14 respondents) are submit through PRISM

## Q3. How did you update your Personal Data Info?



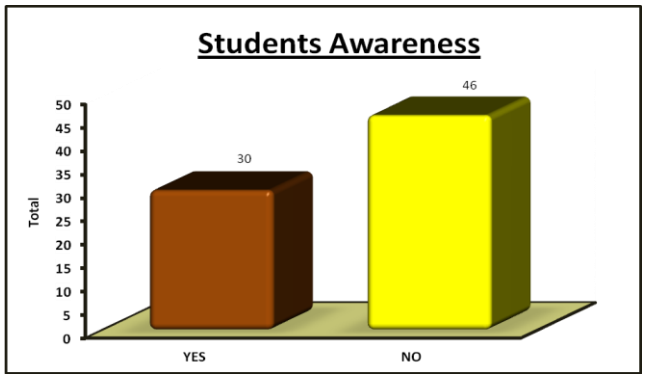

- **40.8%** of the correspondents (31 respondents) went to CSIML
- **59.2%** of the correspondents (45 respondents) update through email

**Q4. How did you record ITC-A (Project Details Form) and Training Schedule details?**



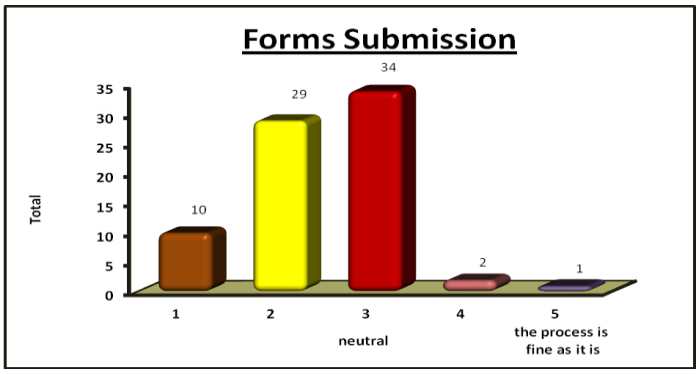

- **56.6%** of the correspondents (43 respondents) are typing and printing
- **14.5%** of the correspondents ( 11 respondents) are used handwriting
- **28.9%** of the correspondents ( 22 respondents) used both method

**Q5. After submission Training Schedule details and Forms (ITC-A to ITC-F) through email, did you aware whether your forms CSIML received or not?**



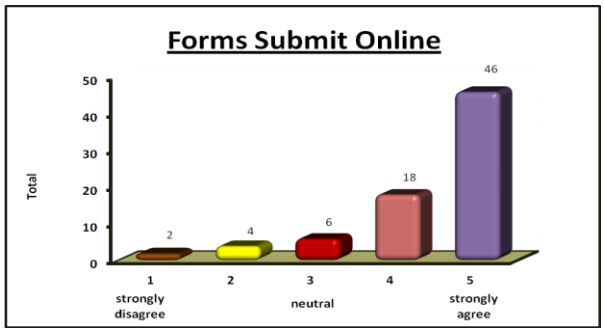

- **39.5%** of the correspondents (30 respondents) answer YES
- **60.5%** of the correspondents (46 respondents) answer NO

**Q6. How do you rate the process of submitting Training Schedule, ITC-A and ITC-C?**



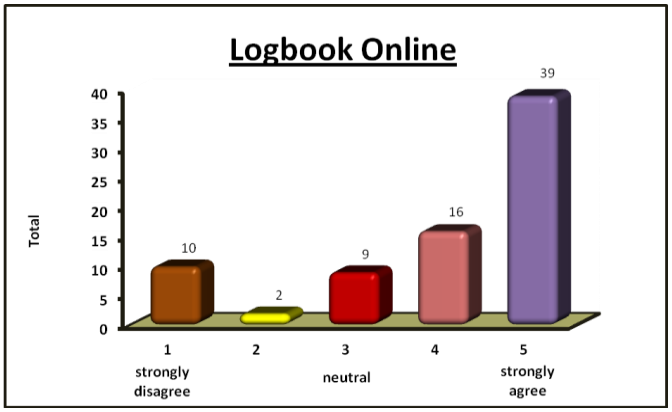

- **13.2%** of the correspondents ( 10 respondents) answer 1
- **38.2%** of the correspondents (29 respondents) answer 2
- **44.7%** of the correspondents (34 respondents) answer 3
- **2.6%** of the correspondents ( 2 respondents) answer 4

**Q7. I believe that it will be easier for students to submit their Training schedule, ITC-A and ITC-C using online forms.**



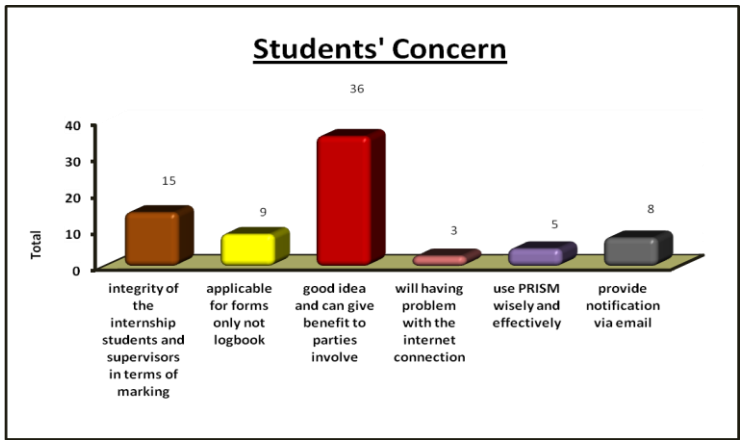

- **2.6%** of the correspondents ( 2 respondents) answer 1 (strongly disagree)
- **5.3%** of the correspondents (4 respondents) answer 2 (disagree)
- **7.9%** of the correspondents (6 respondents) answer 3 (neutral)
- **23.7%** of the correspondents (18 respondents) answer 4 (agree)
- **60.5%** of the correspondents (46 respondents) answer 5 (strongly agree)

**Q8. I believe that it will be easier for me if I can write and submit my weekly log to my Host Company Supervisor online.**




- **13.2 %** of the correspondents (10 respondents) answer 1 (strongly disagree)
- **2.6%** of the correspondents (2 respondents) answer 2 (disagree)
- **11.8%** of the correspondents (9 respondents) answer 3 (neutral)
- **21.1%** of the correspondents (16 respondents) answer 4 (agree)
- **51.3%** of the correspondents (39 respondents) answer 5 (strongly agree)

**Q9. If the CSIML wants to develop CSIML Workflow Management System in which students can submit forms online and supervisors can keep track on student's progress, what would be your concerns about this system?**



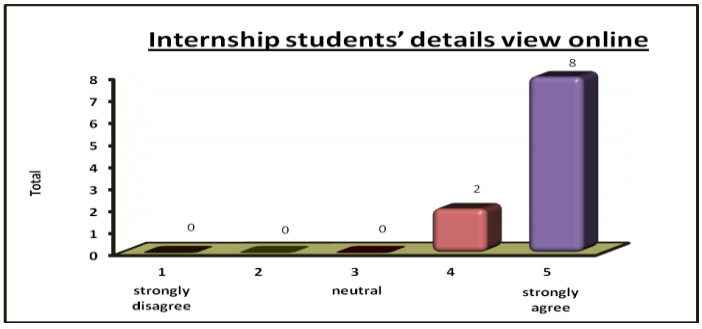

- **19.7%** of the correspondents (15 respondents) said integrity of the internship students and supervisors in terms of marking

- **11.8%** of the correspondents (9 respondents) said applicable for forms only not logbook
- **47.4%** of the correspondents (36 respondents) said it is good idea and can give benefit to parties involve
- **3.9%** of the correspondents (3 respondents) said will having problem with the internet connection
- **6.6%** of the correspondents (5 respondents) said use PRISM wisely and effectively
- **10.5%** of the correspondents (8 respondents) said provide notification via email

### 4.4 UTP Supervisors

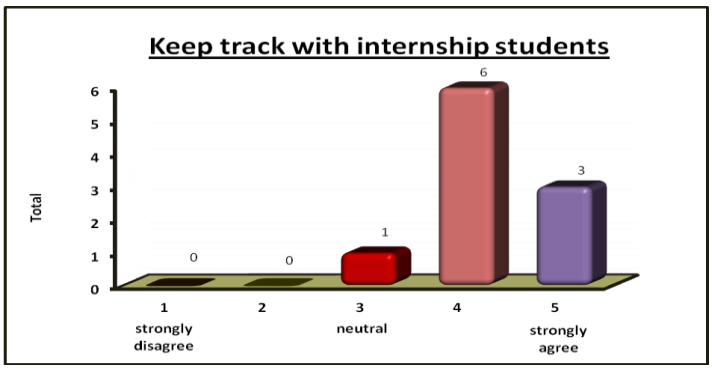
Below is the listed result of online survey from UTP supervisors; 10 correspondents have replied back. These results represent on question based and already calculate the percentage of each answer.

**Q1. I prefer to know the details of the internship students that I am visiting online.**



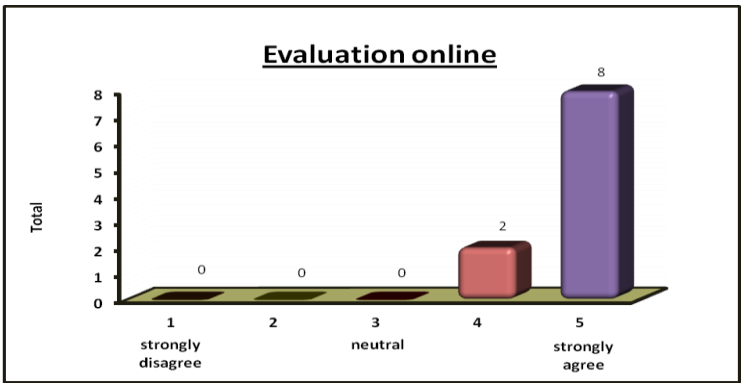

- **20%** of the correspondents (2 respondents) answer 4 (agree)
- **80%** of the correspondents (8 respondents) answer 5 (strongly agree)

**Q2. I feel that it is important for me to know the progress of the student that I am visiting.**



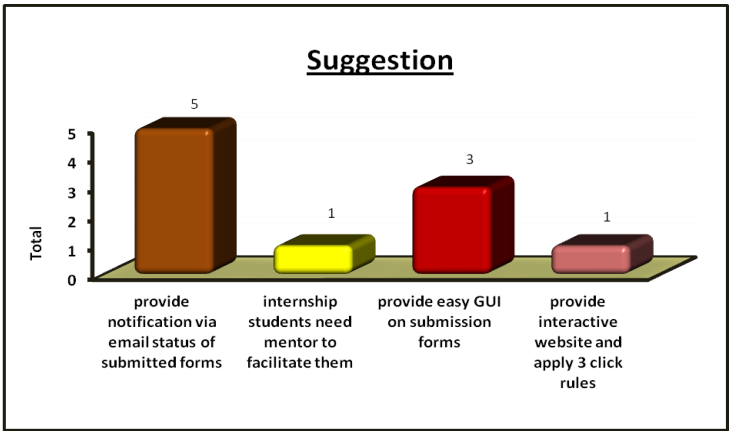

- **10%** of the correspondents (1 respondent) answer 3 (neutral)
- **60%** of the correspondents (6 respondents) answer 4 (agree)
- **30%** of the correspondents (3 respondents) answer 5 (strongly agree)

**Q3. I feel that it is convenient for me to do evaluation online.**




- **20%** of the correspondents (2 respondents) answer 4 (agree)
- **80%** of the correspondents (8 respondents) answer 5 (strongly agree)

**Q4. If there is a system that could facilitate the submission of internship forms, what would be your suggestions on the features that you would like to see in this system.**

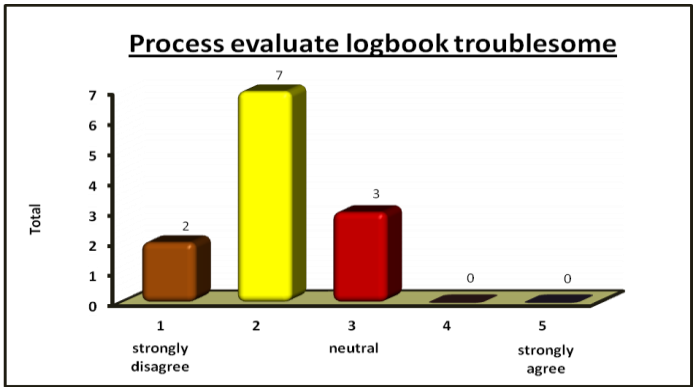



- **50%** of the correspondents (5 respondents) suggest provide notification via email status of submitted forms
- **10%** of the correspondents (1 respondent) suggest internship students need mentor to facilitate them
- **30%** of the correspondents (3 respondents) suggest provide easy GUI on submission forms
- **10%** of the correspondents (1 respondent) suggest provide interactive website and apply 3 click rules

### 4.5 Host Company Supervisors

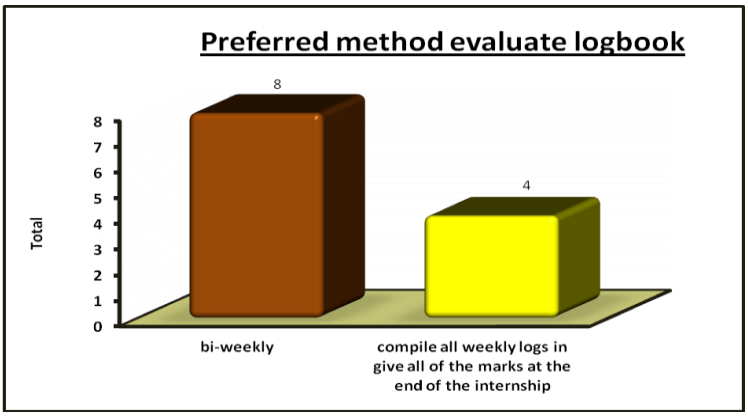
Here is the listed result of online survey from host company supervisors; 12 correspondents have replied back. These results represent on question based and already calculate the percentage of each answer.

**Q1. I feel that the process of evaluating the student's logbook is quite troublesome.**



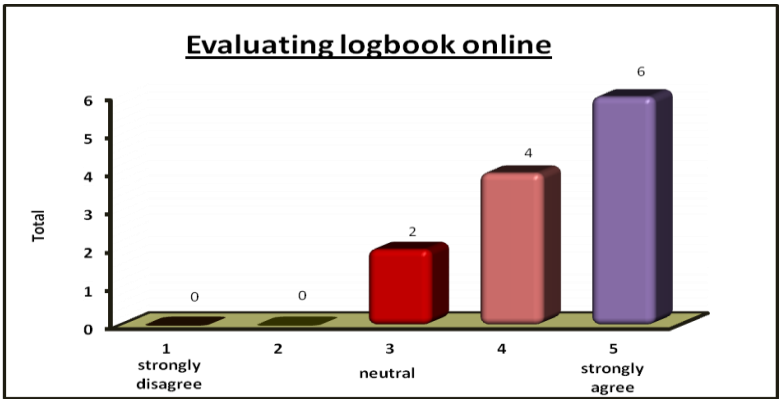

- **16.7%** of the correspondents (2 respondents) answer 1 (strongly disagree)
- **58.3%** of the correspondents (7 respondents) answer 2 (disagree)
- **25%** of the correspondents (3 respondents) answer 3 (neutral)

**Q2. Please rate your preference in evaluating the student's logbook.**



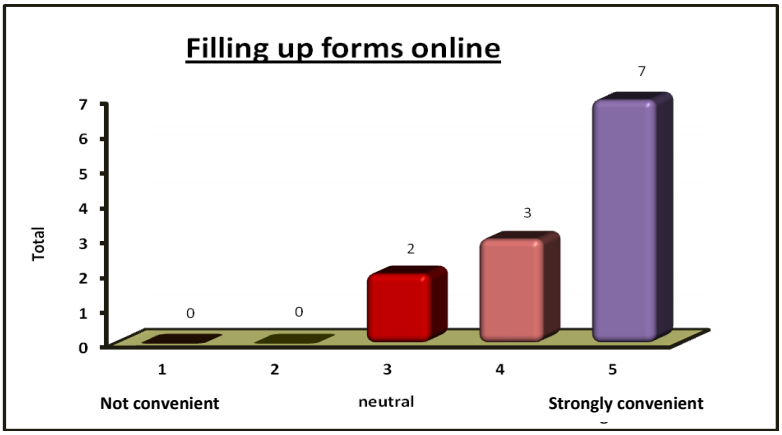

- **66.7%** of the correspondents (8 respondents) answer bi-weekly
- **33.3%** of the correspondents (4 respondents) answer compile all weekly logs in give all of the marks at the end of the internship

**Q3. I personally believe that it will be very useful for me to have the evaluation of the logbook to be done online.**



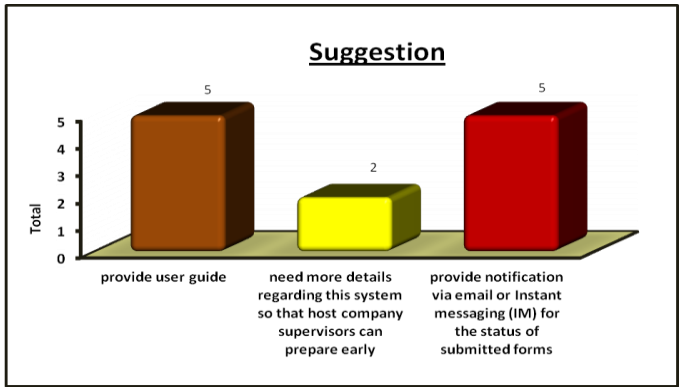

- **16.7%** of the correspondents (2 respondents) answer 3 (neutral)
- **33.3%** of the correspondents (4 respondents) answer 4 (agree)
- **50%** of the correspondents (6 respondents) answer 5 (strongly agree)

**Q4. Currently, first visit report form, presentation forms and performance evaluation form are printed out and supervisors will fill this manually during the lecturer's visit. How would you rate in terms of convenience if the process of filling up the forms is done online during the lecturer's visit?**




- **16.7%** of the correspondents (2 respondents) answer 3 (neutral)
- **25%** of the correspondents (3 respondents) answer 4 (convenient)
- **58.3%** of the correspondents (7 respondents) answer 5 (strongly convenient)

**Q5. If the Student Industrial Internship Unit (CSIML) wants to develop an CSIML Workflow Management System in which students can submit forms online and supervisors can keep track on student's progress, what would be the extra features that you would like to suggest for this system?**




- **41.7%** of the correspondents (5 respondents) suggest provide user guide
- **16.7%** of the correspondents (2 respondents) suggest need more details regarding this system so that host company supervisors can prepare early
- **41.7%** of the correspondents (5 respondents) suggest provide notification via email or Instant messaging (IM) for the status of submitted forms

### 4.6 Discussion

This section analyses the result of the survey from students, UTP supervisors and host company supervisors.

Results from group of students mostly are students who already went for internship. We can see assume that, most of the students prefer online method to do registration, apply internship placements and submit forms and logbook rather than went to CSIML and do manually are time consuming. Do online are more effective and flexible. We can conclude that using online system could be easier and easy for parties involve communicating.

Result from group of UTP supervisors show that they prefer to know students details online. Currently, UTP supervisors need the details from CSIML. They have to wait and it cause time consuming. Manual system using Microsoft Excel provide limited feature. Most of the UTP supervisors said important to know internship students progress. So that, if using this system UTP supervisors could keep track with their internship students. UTP supervisors also prefer to do evaluation online. They also suggest providing notification via email status of submitted forms.

Result from group of host company supervisors show that they prefer to evaluate logbook bi-weekly. They also prefer to do evaluation by online. They suggest that to provide user guide especially for host company supervisors and provide notification via email or IM for status of submission form.

We can conclude that, from the data that was gathered, most of the responders agreed to implement this internship workflow management system.

## 4.7 Gantt Chart

**Table 4: Gantt Chart**

| FYP II SEPTEMBER 2012 TIMELINE | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ACTIVITIES/DATE** | **SEPTEMBER** | | **OCTOBER** | | | | **NOVEMBER** | | | | **DECEMBER** | | | |
| | **W1** | **W2** | **W3** | **W4** | **W5** | **W6** | **W7** | **W8** | **W9** | **W10** | **W11** | **W12** | **W13** | **W14** |
| **DESIGN PHASE** | | | | | | | | | | | | | | |
| • Sketch the interface | | | | | | | | | | | | | | |
| • Look for interface template | | | | | | | | | | | | | | |
| • Prepare the interface | | | | | | | | | | | | | | |
| • Link the pages | | | | | | | | | | | | | | |
| • Implement Sign-up function | | | | | | | | | | | | | | |
| • Implement Login function | | | | | | | | | | | | | | |
| • Implement form function | | | | | | | | | | | | | | |
| • Implement Email Notification functions | | | | | | | | | | | | | | |
| **TESTING & ENHANCEMENT PHASE** | | | | | | | | | | | | | | |
| • System Testing by UTPSV & students | | | | | | | | | | | | | | |
| **SUBMISSION PROGRESS REPORT** | | | | | | | | | | | | | | |
| **DESIGN & IMPLEMENT PHASE CONTINUES/UPDATED** | | | | | | | | | | | | | | |
| **PRE-EDX** | | | | | | | | | | | | | | |
| **DISSERTATION SUBMISSION** | | | | | | | | | | | | | | |
| **VIVA PRESENTATION** | | | | | | | | | | | | | | |
| **FINAL DISSERTATION SUBMISSION** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| **LEGEND:** | Progress | | | | | | Dateline | | | | | | | |

## 4.8 Unified Modelling Language (UML)

Unified Modelling Language (UML) is a standardized general-purpose modelling language. It is include a set of graphic notation techniques to create visual models of systems.

The UML is used to specify, visualize, modify and construct of systems under development. Some of the elements include in UML are:

- Activities
- Actors
- Business processes
- Database schemas
- Logical components
- Programming language statements
- Reusable software components

UML combines techniques from data modelling (entity relationship diagrams), business modelling (workflows), object modelling and component modelling. It can be used with all processes throughout the development life cycle.

### 4.8.1 UML Class Diagram: Web-based Transactions

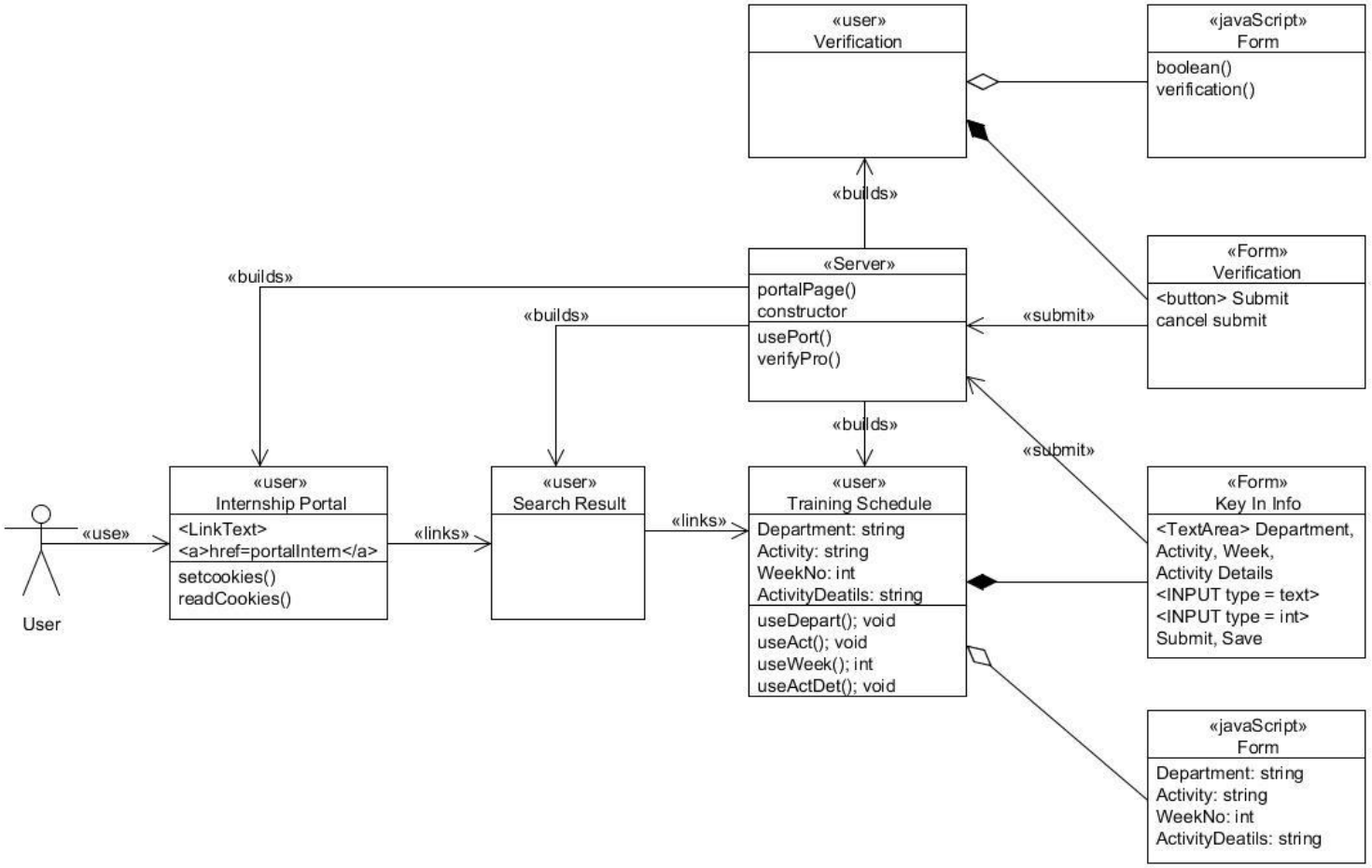



**Figure 16: web transition**

### 4.8.2 UML Communication Diagram: Log-in Scenario

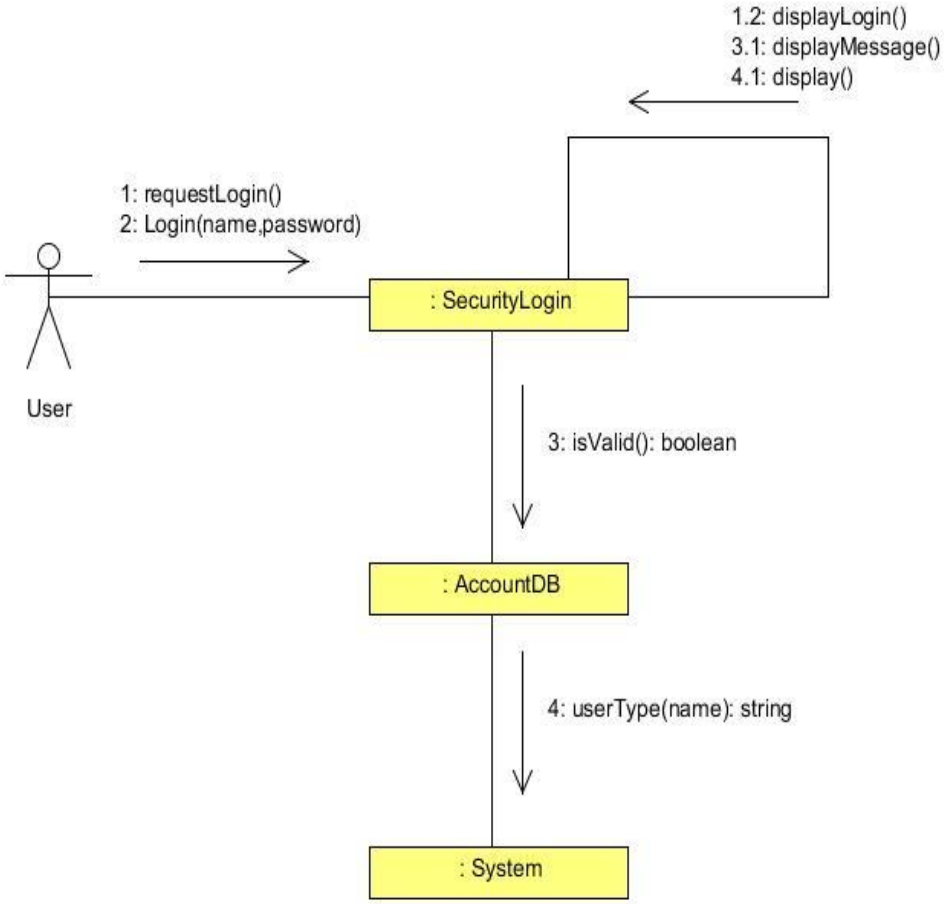



**Figure 17: login scenario**

### 4.8.3 UML Communication Diagram: Database Creation

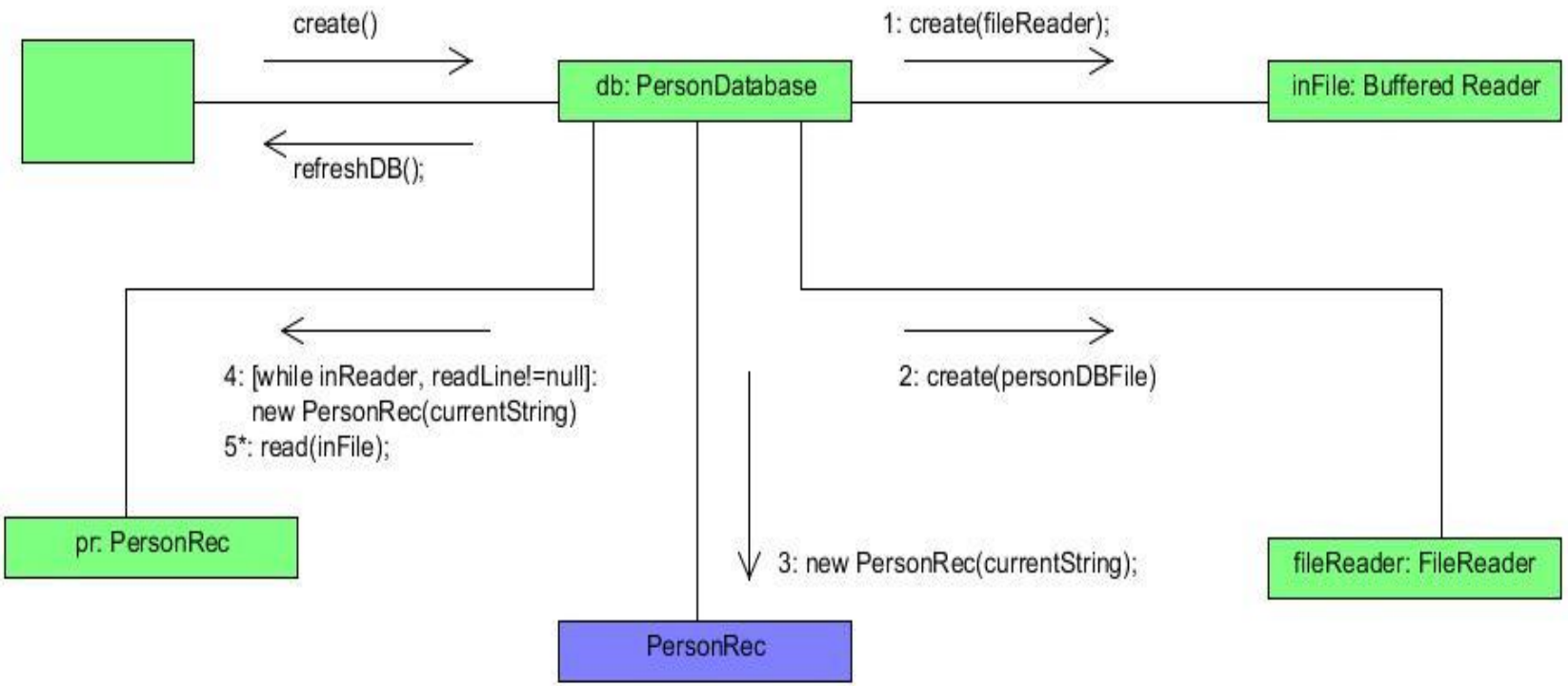



**Figure 18: database**

### 4.8.4 UML Activity Diagram: Email Notification

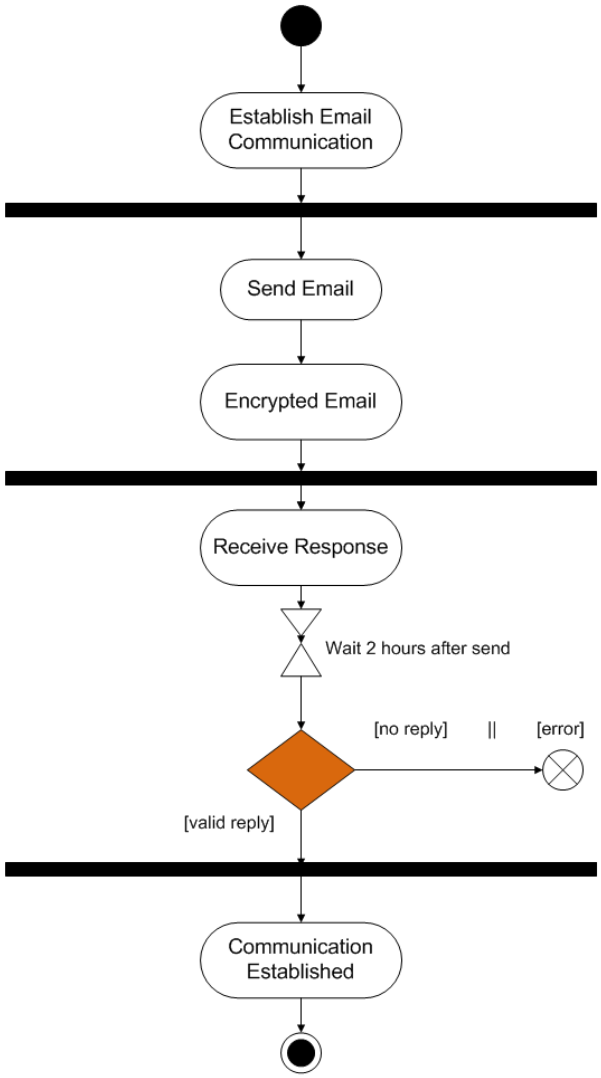



**Figure 19: email notification**

## 4.9 System Operation

The system operation starts at the “Industrial Internship” where in this category, it allows user to select the forms or logbook. There are 3 main categories in this label which are Pre-Internship, Internship and Logbook.

Under the Pre-Internship label are involve registration process. Students need to key in PDI, upload resume, choose internship placement and approve internship placement.

Lastly, under the Internship label and Logbook label students need to update logbook and get HCSV approval every 2 weeks and submit forms needed.

After entered all the above details, user will need to click on *Submit* button to store the information into database. User also can edit or update the information before submit.

### 4.9.1 Sample of Result

The system has successfully performed all of its intended functionality. The actual data collection process has yet to be carried out due to the time constraint. Below Figure 20 shows the sample results of PDI forms. This forms under Pre-Internship process.


**Figure 20: Personal Data Info (PDI)**

Figure 21 shows the example result from logbook. After students have done key in all the necessary information into the system. CSIML and UTPSV will received this information. This is the way to keep track with internship students and to ensure students did their work during internship period.

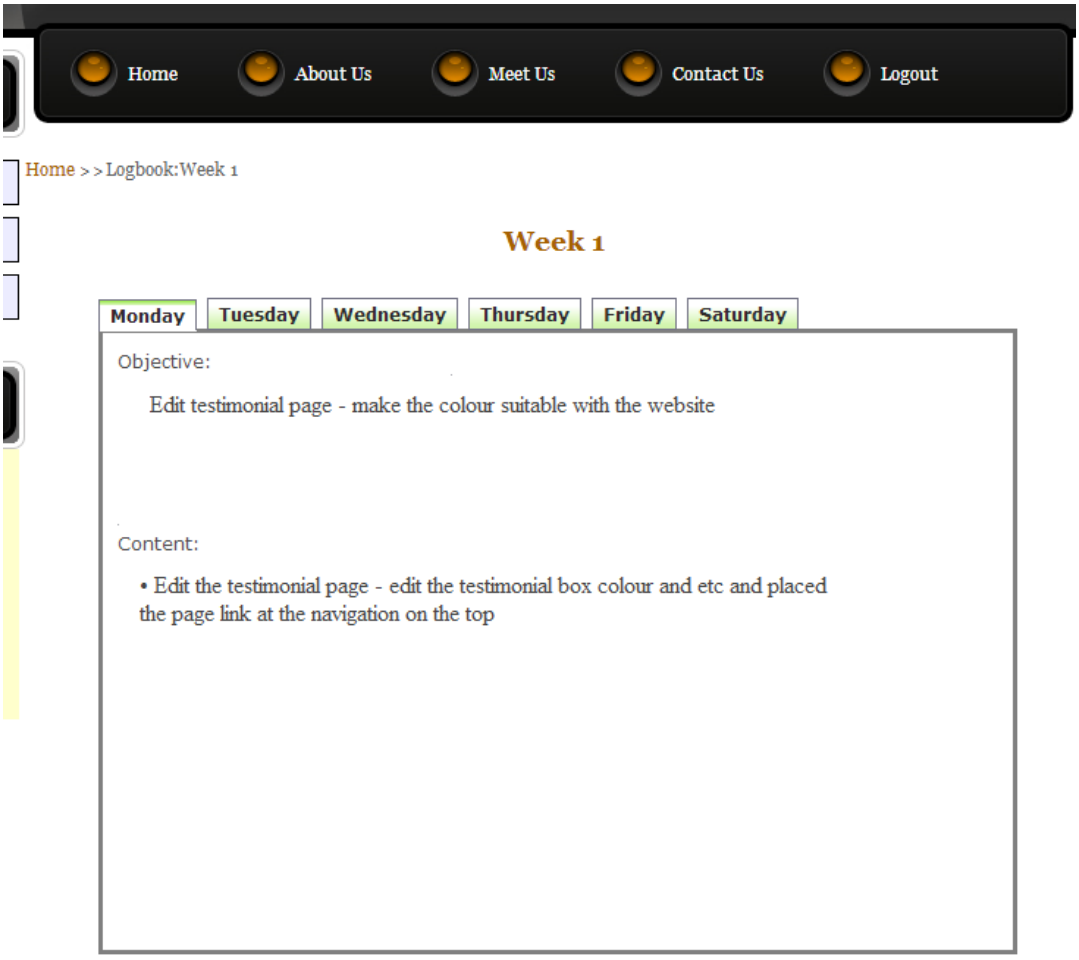



**Figure 21: Logbook Week 1**

# CHAPTER 5

# CONCLUSION

The existing workflow system starting from student application until grading is working in manually. Number of problems can be identified such as loss of internship students' information detail, high printing cost, students monitoring as well as too time consuming and also can cause weakness in the system.

Internship Workflow Management System helps to centralize the data and give a lot of benefits to users especially for CSIML to view, store, manage information and keep track on internship student progress. This system is designed to ease four parties which are CSIML, UTP supervisors, host company supervisors and internship students. At the same time, this system can help CSIML to provide high quality service also to ensure the success of internship program and to enhance the relationship between UTP and the industries.

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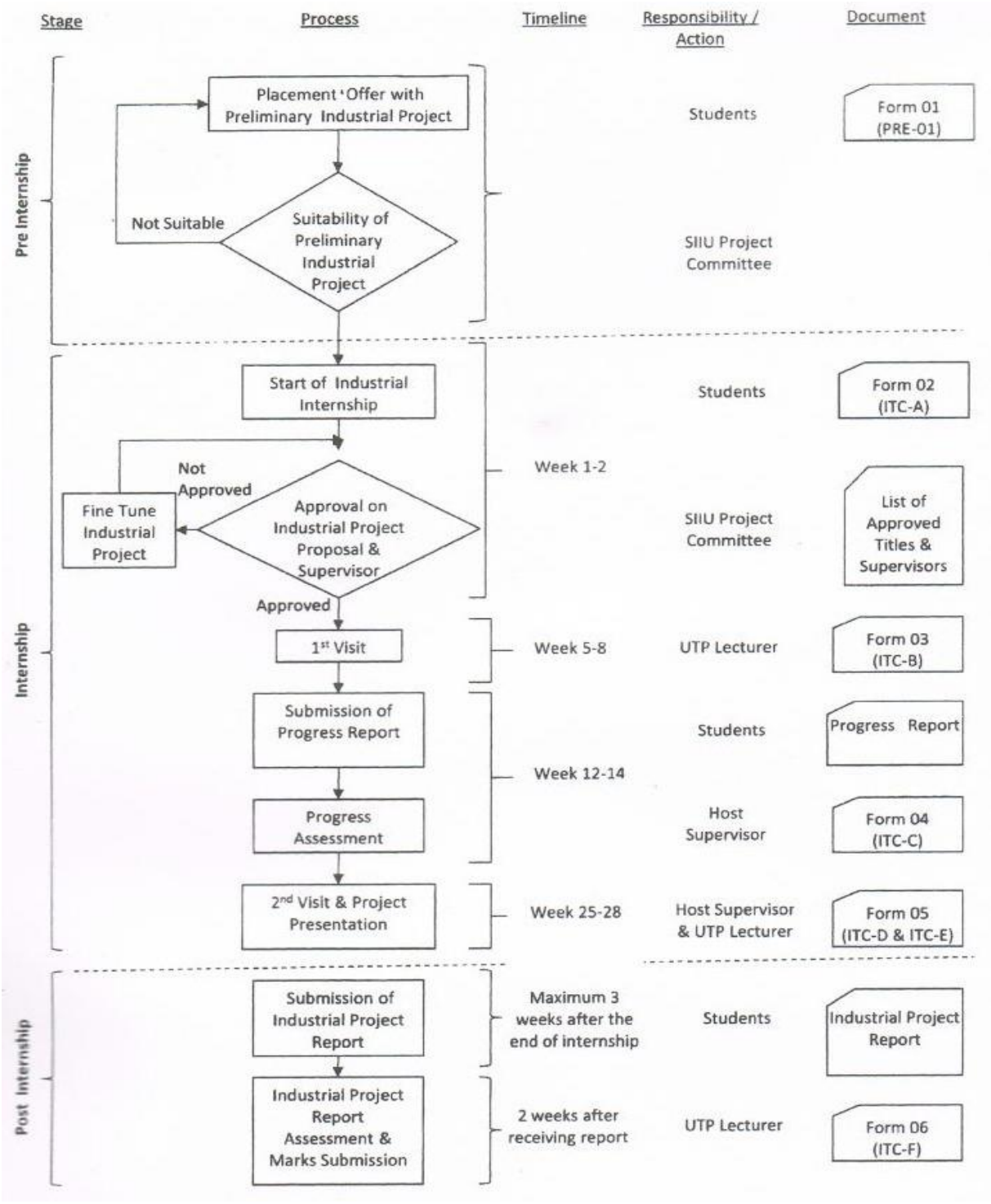
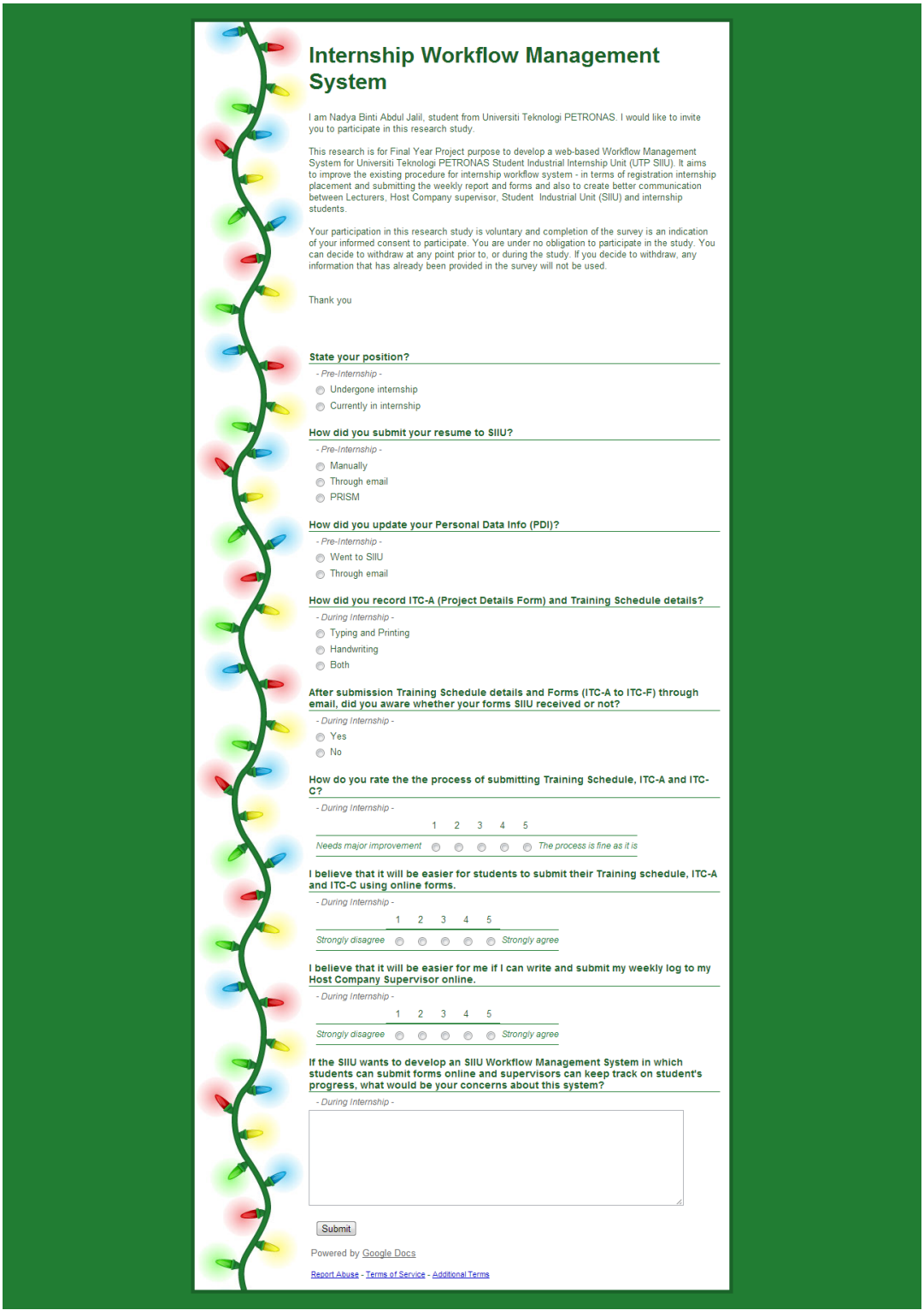
# APPENDICES

## Appendix 1: Existing Workflow Management System Flow Chart



# Appendix 2: Survey Form for Internship Student



## Internship Workflow Management System

I am Nadya Binti Abdul Jalil, student from Universiti Teknologi PETRONAS. I would like to invite you to participate in this research study.

This research is for Final Year Project purpose to develop a web-based Workflow Management System for Universiti Teknologi PETRONAS Student Industrial Internship Unit (UTP SIIU). It aims to improve the existing procedure for internship workflow system - in terms of registration internship placement and submitting the weekly report and forms and also to create better communication between Lecturers, Host Company supervisor, Student Industrial Unit (SIIU) and internship students.

Your participation in this research study is voluntary and completion of the survey is an indication of your informed consent to participate. You are under no obligation to participate in the study. You can decide to withdraw at any point prior to, or during the study. If you decide to withdraw, any information that has already been provided in the survey will not be used.

Thank you

**State your position?**

*- Pre-Internship -*

- Undergone internship
- Currently in internship

**How did you submit your resume to SIIU?**

*- Pre-Internship -*

- Manually
- Through email
- PRISM

**How did you update your Personal Data Info (PDI)?**

*- Pre-Internship -*

- Went to SIIU
- Through email

**How did you record ITC-A (Project Details Form) and Training Schedule details?**

*- During Internship -*

- Typing and Printing
- Handwriting
- Both

**After submission Training Schedule details and Forms (ITC-A to ITC-F) through email, did you aware whether your forms SIIU received or not?**

*- During Internship -*

- Yes
- No

**How do you rate the the process of submitting Training Schedule, ITC-A and ITC-C?**

*- During Internship -*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| *Needs major improvement* | | | | | | *The process is fine as it is* |

**I believe that it will be easier for students to submit their Training schedule, ITC-A and ITC-C using online forms.**

*- During Internship -*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| *Strongly disagree* | | | | | | *Strongly agree* |

**I believe that it will be easier for me if I can write and submit my weekly log to my Host Company Supervisor online.**

*- During Internship -*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| *Strongly disagree* | | | | | | *Strongly agree* |

**If the SIIU wants to develop an SIIU Workflow Management System in which students can submit forms online and supervisors can keep track on student's progress, what would be your concerns about this system?**

*- During Internship -*

Submit

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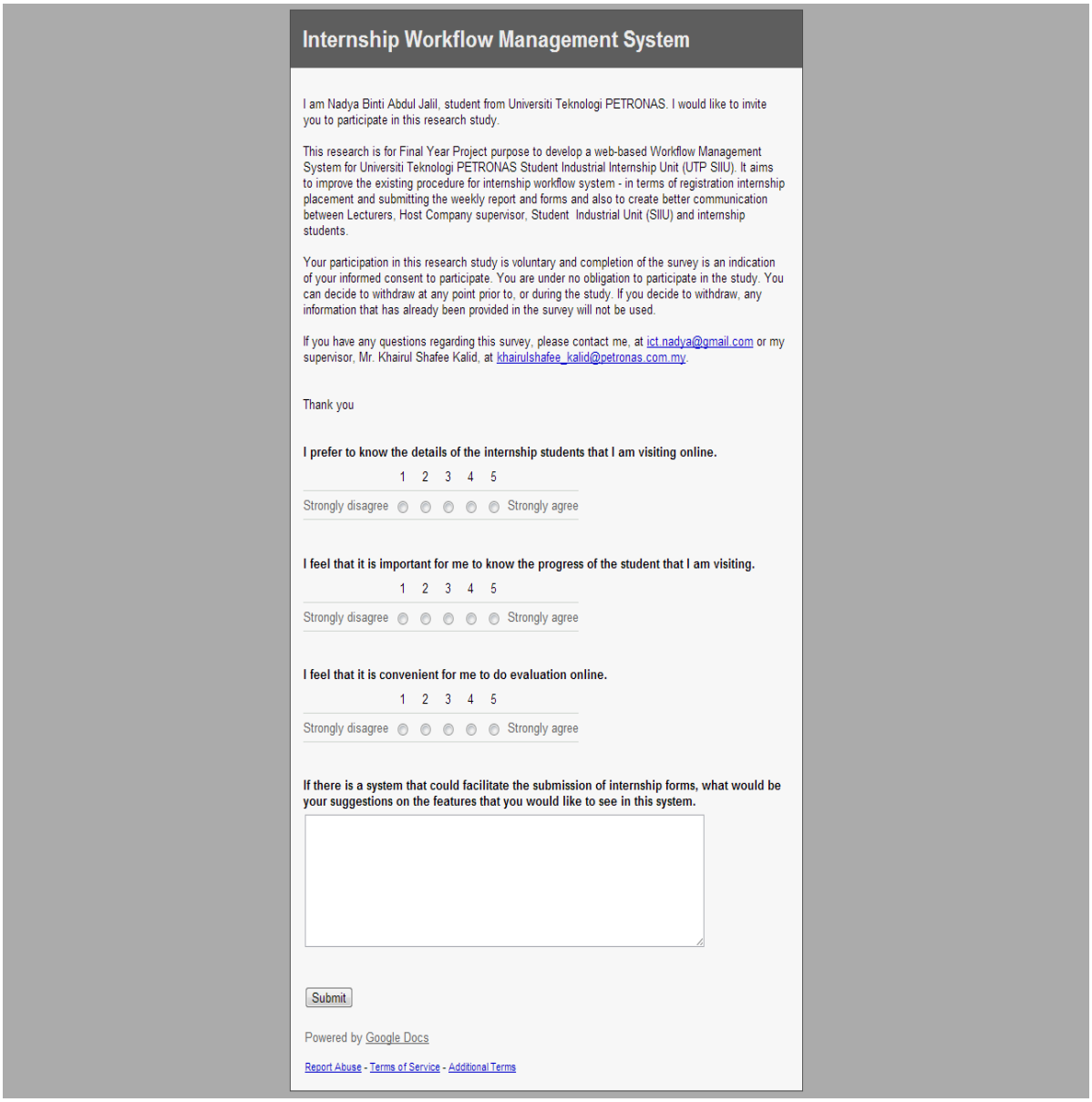
## Appendix 3: Survey Form for UTP Supervisor



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If you have any questions regarding this survey, please contact me, at ict.nadya@gmail.com or my supervisor, Mr. Khairul Shafee Kalid, at khairulshafee_kalid@petronas.com.my.

Thank you

**I prefer to know the details of the internship students that I am visiting online.**

1 2 3 4 5

Strongly disagree ○ ○ ○ ○ ○ Strongly agree

**I feel that it is important for me to know the progress of the student that I am visiting.**

1 2 3 4 5

Strongly disagree ○ ○ ○ ○ ○ Strongly agree

**I feel that it is convenient for me to do evaluation online.**

1 2 3 4 5

Strongly disagree ○ ○ ○ ○ ○ Strongly agree

**If there is a system that could facilitate the submission of internship forms, what would be your suggestions on the features that you would like to see in this system.**

Submit

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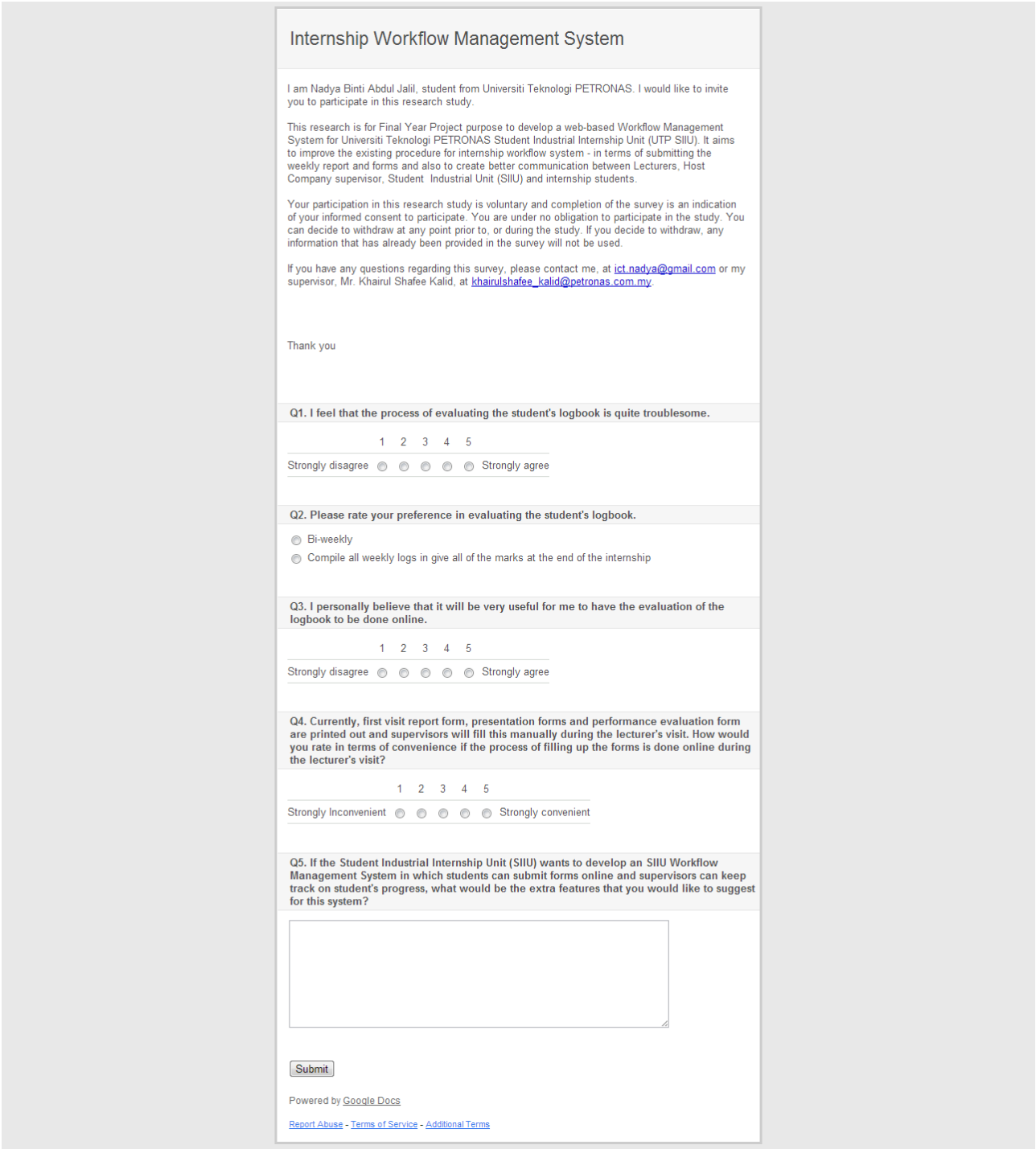
## Appendix 4: Survey Form for Host Company Supervisor



Internship Workflow Management System

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If you have any questions regarding this survey, please contact me, at ict.nadya@gmail.com or my supervisor, Mr. Khairul Shafee Kalid, at khairulshafee_kalid@petronas.com.my.

Thank you

**Q1. I feel that the process of evaluating the student's logbook is quite troublesome.**

1 2 3 4 5

Strongly disagree ○ ○ ○ ○ ○ Strongly agree

**Q2. Please rate your preference in evaluating the student's logbook.**

- ○ Bi-weekly
- ○ Compile all weekly logs in give all of the marks at the end of the internship

**Q3. I personally believe that it will be very useful for me to have the evaluation of the logbook to be done online.**

1 2 3 4 5

Strongly disagree ○ ○ ○ ○ ○ Strongly agree

**Q4. Currently, first visit report form, presentation forms and performance evaluation form are printed out and supervisors will fill this manually during the lecturer's visit. How would you rate in terms of convenience if the process of filling up the forms is done online during the lecturer's visit?**

1 2 3 4 5

Strongly Inconvenient ○ ○ ○ ○ ○ Strongly convenient

**Q5. If the Student Industrial Internship Unit (SIIU) wants to develop an SIIU Workflow Management System in which students can submit forms online and supervisors can keep track on student's progress, what would be the extra features that you would like to suggest for this system?**

Submit

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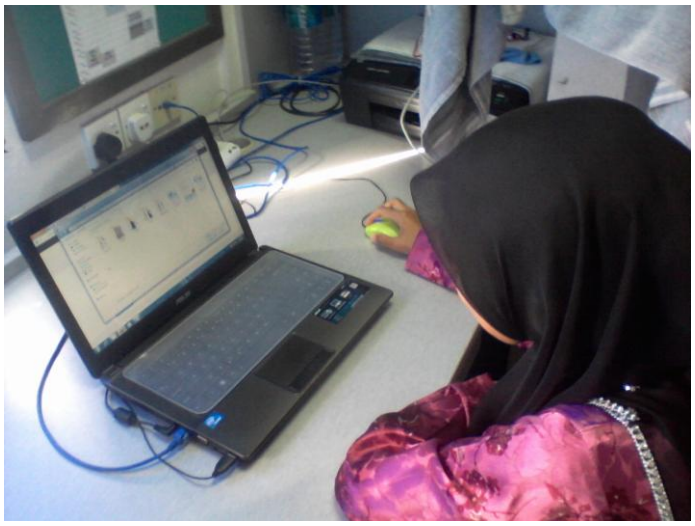
**Appendix 5:** The user testing was done by students

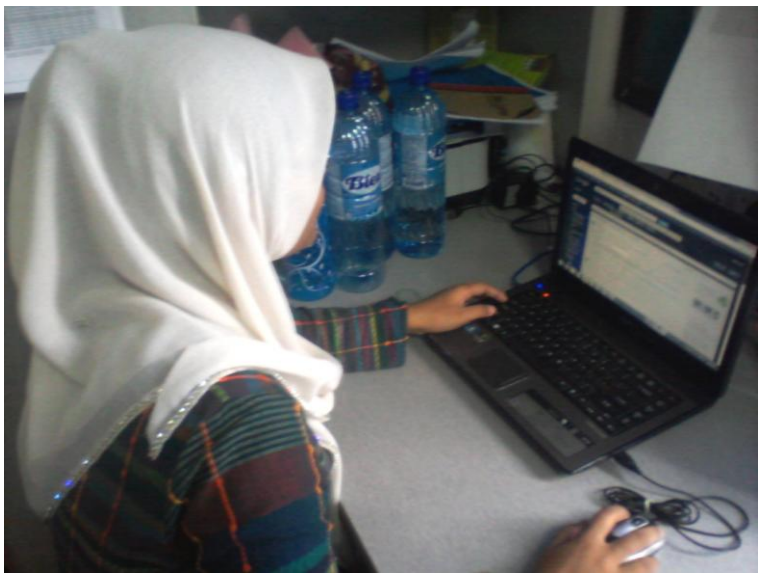


Name: Siti Aisyah Binti Abd. Rahaman

Course: Electrical & Electronic Engineering

Year: 2nd Year 2nd Semester

Testing part: Uploading File



Name: Nor Azlina Binti Mohd Nasir

Course: Chemical Engineering

Year: Final Year Final Semester

Testing part: Email notification