Intellectual Property Management System

(IPMS)

by

Muhammad Rashidin bin Omar

Dissertation submitted in partial fulfilment of
the requirements for the
Bachelor of Computer Science (Hons.)
Business Information System

September 2011

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CERTIFICATE OF APPROVAL

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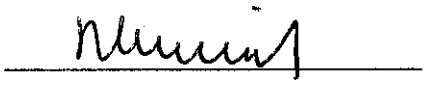
Approved by,



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TRONOH, PERAK

September 2011

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 of persons.

Muhammad Rashidin bin Omar

ABSTRACT

Intellectual Property can be defined as the permission to control the use of certain intangible expression and ideas in a form of entitlement, for an individual. For many reasons, intellectual property or IP has been playing a major role in many organizations that promote invention and innovation. The reason of having a good IP practise is to ensure the idea and work of one particular inventor or innovator will be secure from infringement and plagiarism. In Malaysia especially, many organizations still don't have a good IP practise. Those companies tend to neglect the necessity of having their idea protected and secured.

In order to fulfil the needs of having a simple system that can help organizations to promote a good IP practise, Intellectual Property Management System or IPMS came into the picture. The purpose of this system is to act as a hub that can help organizations to smoothen the procedure of patenting within the premise. Traditional ways are normally can be related to the use of paper and pen. Inventors and innovators have to fill a 5-page of form and have to wait for a long period of time before their idea being approved by the employer. There are many risks when using the traditional way. The papers went missing, misplaced, tear apart; there are all the risks that might occur.

For this project, IPMS has selected the Knowledge Sharing unit of PETRONAS Carigali Sdn. Bhd. as its target organization. IPMS will allow users to gather different type of documents; like journals, research papers, project proposals, articles, drawings, as well as logo. By using a simple click on the system, the users don't have to fill the form by hand, instead just only type it on their keyboard. In the other hand, there are few potential departments have been identified like Exploration, Subsea, Drilling, Deep Water, Production, and Subsurface. Those departments have been selected because of their contribution in producing new products like machines and other equipments.

The methodology that will be used in the development of this project will be throwaway prototyping. This methodology allows developer to create a prototype before the actual system can be released. Apart from that, any modification can be made during the development of the prototype if there is a need from the users.

This system hopefully can help to overcome few drawbacks of practicing traditional way. The current practice that is currently used involves pen and paper, and more papers. Applicants need to fill in a 5-page form (more or less) and it will involve more papers in the future. Based on current trending of this technology era, the head of departments can simply download the paperwork and copy them to their tablet or smart phones. They can view and read the paperwork anywhere even at home. From there, the head of department can cut the time of reading the paperwork. When the paperwork is on a paper, they can't bring back a bundle of papers anywhere, surely because it is heavy and messy. With the presence of this IPMS system, hopefully the burden can be put away and managing the intellectual property matters will be more intelligent.

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INTRODUCTION

1.1 Introduction

This chapter will describe the background of study, problem statement, objective, limitation, tools and equipment required and short summary of the research project.

1.2 Background Study

Intellectual asset refers to creations of the mind, human knowledge, and the ideas. It can appear in any form, like for example names, symbol, invention, artistic works and design. Intellectual asset also can be related to the concept of knowledge. Knowledge is divided into two types, commonly known as tacit knowledge and explicit knowledge. Tacit knowledge is the knowledge that someone posses in their mind and expert in that. For example, that particular person masters the knowledge on the process of formatting a desktop. Tacit knowledge controls 80% of human mind.

Another type of knowledge is explicit knowledge. Explicit knowledge is the knowledge that someone posses and able to deliver it to other people in a particular manner. Explicit knowledge resides 20% in human mind. It can be delivered in many ways like manual, public speaking, books, and even journals. The different between both tacit knowledge and explicit knowledge is the way those knowledge being presented. The deliverable of tacit knowledge is not the same every time one particular person tries to express it. Someone might expert in one matter and doesn't need a book to refer to; like

a surgery doctor, but the means are never got to be the same. The deliverable of explicit knowledge could be the same all the time.

Intellectual asset is the tacit knowledge that someone posses, but the action of producing intellectual asset is the combination of tacit knowledge and explicit knowledge. In the study of intellectual property, intellectual property laws are actually designed to keep the ideas from being copied by others. The intention of having the idea protected is to protect its market and profit at the same time. The basic concept of intellectual property can be recalled back since the fourth century BC. Arguments for rewarding innovators are that the idea belongs to its creator because the idea is a manifestation of the creator's personality. The innovators also should be awarded with property. The idea of intellectual property is a common thing in today's market-based economies. If everybody is free to access new knowledge, inventors have a small incentive to commit resources to producing it.

Intellectual property can be classified into two categories, in which it includes industrial property like patents, industrial designs, as well as trademarks. Another category is copyright, which includes literary works such as films, drawings, photographs, as well as novels. The term rights refer to those performing artists in their performances as well as those of broadcasters in their television and radio programs. Creative expressions and innovations of local communities are also can be considered as intellectual property (IP) but may not be fully protected by existing IP system.

1.3 Problem Statement

"The idea that has been produced is exposed to any threat like copying or stealing."

When inventors or innovators have transformed the idea to being something tangible, it is very vital to protect the idea. Before the inventors or innovators can publish the idea in the public, it is very important to secure the idea first.

Unprotected idea will lead to imitation activities and stealing when the inventors and innovators publish the idea in the public. There are no legal action could be taken if the idea is used by other people, knowing the fact that the idea is not patented.

When the idea has been drafted out in a form of tangible presentation, the owner should be able to prevent it from any activities that could ruin the presentation of idea. When the inventors or innovators join any conference, and publish the idea in the public, there is a risk of the idea being copied or imitated. When the idea is not patented, and other people use the idea to produce own product, the original owner of the idea could not take any legal action to the imitator. It could lead to the loss for the original owner of the idea.

"Intellectual property is essential in making sure your idea is safe with you and other people won't to steal your golden idea."

Another purpose of having our idea protected is to ensure it won't be stolen by other people. There are always chances and possibilities for other people to steal our idea at any place and time like during the conference, daily meeting, perhaps even during our phone conversation. It is essential to know a little bit more about intellectual property and how it could help individuals to secure and protect their ideas. In the other hand, it also helps organizations to promote good innovative and creative thinking for its employees. Awareness should be created during the early stage of employees' involvement in the company.

By practicing a good intellectual property practice in hand, individuals and organizations can gain more out of their contributions idea. People can make millions just because of his or her single idea, and the company can increase their revenue because of that new innovative and productized idea. That is why learning and knowing more about intellectual property is essential in making sure both individuals and organizations can make full use out of it.

There are some problems that might occur when the nature and law of intellectual property is not being practiced:

- The idea that being generated can possibly being copied by others. Once the idea being invented, the original owner of the idea could not do anything since the idea is not protected. They also can't claim anything or sue the inventor.

- If the idea is not protected, there might be cases where other competitors are copying the final product and come up with pirated version of it. The original product might have some difficulties in the market since the pirated product offers much cheaper price.

- The owner of the idea might have some clash with the employer due to lack of understanding regarding this matter. The owner might think that it is his own idea because the employer didn't clarify this matter earlier. The protection might have not been applied by the employer and this case will bring future conflict of interest between the employee and employer.

1.4 Objectives

The objectives of this project are:

- Collecting ideas in tangible form before it can be proceed to be granted by MyIPO.
- Allowing users to search for related ideas that have been patented. This activity will be able to help users to check whether their idea or much alike idea has been produced by other people or not.
- Allowing the organizations to collect all the patented ideas and locate them in one place that are accessible to all for best practices and references.
- Ease the way of reviewing paper by selected persons.

1.5 Scope of Study

The scope of the project will be mainly on the designation of an application system on knowledge asset. This application system will manage the ideas on the paper works based on their particular clusters and classifications either it is a document, a book, an article, or others. This also will cover various areas particularly regarding the knowledge asset and its protection like for example the procedure of having it protected as well as the notification once it has been secured. The system will also be made as so to meet all the requirements that have been pre-determined earlier.

The main target of this project is basically to allow users from Exploration, Drilling, Production, Subsea, Deepwater, as well as Subsurface Department of PETRONAS Carigali Sdn. Bhd. The reason why those departments have been chosen is because they are the most active departments in PETRONAS Carigali Sdn. Bhd. in producing new equipments and machineries. Most of the ideas are normally will be used and developed by the organization for various purposes like cutting down the cost of production, promoting green

technology, as well as makes things simpler. But within the 3 month, other departments will be added into the system as well.

Those innovators and inventors within the organization can used various types of files in order to upload them in the system. It can be in a form of document (.doc / .docx), spreadsheet, image file (.jpeg, .gif, .png), journal in document format, project proposals, articles, books, instructions, manuals, symbols, as well as logo. Those types of files are common for the engineers and business people in the organization as their idea in tangible form.

There are three parties that will involve in this project. Each of this party has their own boundaries in limitation onto this system. They are:

Knowledge Sharing (KS) unit of PETRONAS Carigali Sdn Bhd

KS unit in PETRONAS Carigali Sdn. Bhd. is the main key player of this project. KS unit members are the one who will be assigned to monitor and maintain the system. The tasks that will be assigned to them are, monitor the back-end of the system including the administration, approve the new users of the system, monitor the files that being uploaded, and deal with any issue with regard to the users of this system. Another function of KS unit is to extend the potential papers to the Corporate Governance office for further clarification.

Corporate Governance

Corporate governance or CG is another party that will involve in this entire system. CG office is the one who will manage the in and out issues and matters with regard to its employees and units within the organization. Once the potential papers have been filtered by the KS unit, the papers will be submitted to the CG office before it can be extended to the Intellectual Property Corporation of Malaysia (MyIPO). Every month, KS unit will send in the potential files, and CG will determine whether the files will be send to the MyIPO after doing some studies about the financial part as well as

project's functionalities. After those studies have been made, the paper will be prolonged to be patented by the MyIPO.

Intellectual Property Corporation of Malaysia (MyIPO)

MyIPO is an organization that is responsible to give full authorities of patenting any idea by any individuals or group of people. The functions of MyIPO are to ensure the provisions of the IP legislation are ministered and enforced accordingly, to regulate and supervise issues or matters relating to IP in relation to the IP legislation, as well as to promote and organize cooperation program at national and international levels. MyIPO is the highest body in Malaysia in patenting and securing idea by any individuals.

1.6 Feasibility Analysis

Based on the feasibility analysis that has been discussed, below are some of the highlights:

Technical Feasibility Analysis

There are some risks that should be considered as Intellectual Property Management system is technically feasible:

i) **High risk on familiarity with technology**

The back end database will be developed using Microsoft Access meanwhile the front end user interface will be developed using Microsoft Visual Basic 2008. It is noted that end users may not very familiar of both tools; however, the system only interacts with users on the interface level and does not require back end coding activities.

ii) **Medium risk on familiarity with application**

Current practice doesn't involve any system management by the organization. The user only deals with the user interface and the system will lead them throughout the process. However, certain precautionary measures will be taken so that the end users should know how to manage and control the system by themselves without external supervision. Preliminary interface design will also be performed prior to actual implementation of system.

iii) **Medium risk on project size**

There are two categories of users that will use this system. First is the user who will deal with the user interface only. This category of user will be the one who use the system. They are the one from researchers group,

engineers group, innovators group, inventors group, and more. Second is the user who will manage the system from its database until the design of its interface. This category is the one who will be the administrator to this system and control everything and it is normally the unit who will be in charge of this, which is Knowledge Sharing unit.

iv) **Low risk on compatibility**

The system will be fully developed using Microsoft Access. It is noted that this program has been installed already in every PCs within the organization. Microsoft Visual Basic 2008 can be easily installed in the PCs since the company already have the copies of its installer.

Organizational Feasibility Analysis

From an organizational perspective, this project has medium risk. The objective of the system which is to ease the burden and increase work efficiency is aligned well management's goals of encouraging operational effectiveness within the Technology & Information Management department. The move to employ a proper intellectual property management system from current practice (using external system) helps achieve the management target.

1.8 Summary

In this chapter, it is to hope that the problems that may encounter are well explained and because of the problems, that is where this system comes into the picture. The rationalization of this project is to make the audience understand their roles and responsibilities in good manner to use this system.

CHAPTER 2

LITERATURE REVIEW AND THEORY

2.1 Introduction

In this chapter, audience will be exposed more on what are the reasons and importance of having a good intellectual property practice within organization. It is to ensure the idea of having this Intellectual Property Management System will be proven that it is strongly supported by external sources in having a good practice of intellectual property.

The purpose of Intellectual Property Management project is to produce an online system where it could keep intellectual assets like journals, research papers, and articles within an organization produced by innovators, inventors, and also researches. Before hand, every term that will be used will be explained in order to give future understanding regarding the subject matter and how they relate with the project. The first term that will be introduced is intellectual capital and how it can be a part of the intellectual property. Second term is going to be human capital, what is its contribution and also the term intellectual assets came into the picture. Intellectual property will be explained later in this section.

2.2 Intellectual Capital

Intellectual capital can be defined as a knowledge that has been collected whether it is documented or not, from individuals within an organization or society (Arai & Hisamitsu, 2000). The knowledge that has been gathered can be used for several purposes like to generate wealth, gain competitive advantage, and also to develop value of other types of capital (Stim & Elias, 2003). Intellectual capital is being a part of customer capital, human capital, intellectual property, and structural capital (Stim & Elias, 2003). Listed below are the taxonomies that can be recognized in the definition of intellectual capital:

2.1.1 Structural Capital

Structural capital allows human capital to function in the form of supportive infrastructure, processes, and database of an organization (Lai, 2001). Structural capital can be a part of patents, trademarks, hardware, information system, and proprietary databases. Structural capital can be categorized into organization, process, and innovation capital due to its diverse components (Patricia, 2004). Organization capital can be defined as the organization values and systems for leveraging the organization's capability. Process capital is the technique that implements the production of goods and services. Innovation capital can be divided into two, which are intellectual properties and intangible assets (Patricia, 2004).

2.1.2 Relational Capital

Relational capital contains more items that can be identified like licenses, trademarks, franchises, relationships, and customer interactions. The idea of the differentiation between customer capital and human and structural capital shows its significance to an organization (Jason, 2006).

2.3 Human Capital

Human capital can be defined as a set of skills where an employee manages to acquire it through few means through the job scope itself, training, and experience, where it can increase that particular employee's value in the marketplace (Arai, 2000). Human capital also may be referring to the knowledge and personality attributes that may be represented in the skill of one employee through experience and education (Reisberg, 2007). *"Fourthly, of the acquired and useful abilities of all the inhabitants or members of the society. The acquisition of such talents, by the maintenance of the acquirer during his education, study, or apprenticeship, always costs a real expense, which is a capital fixed and realized, as it were, in his person. Those talents, as they make a part of his fortune, so do they likewise that of the society to which he belongs. The improved dexterity of a workman may be considered in the same light as a machine or instrument of trade which facilitates and abridges labor, and which, though it costs a certain expense, repays that expense with a profit."* (Reisberg, 2007).

Human capital is one of the factors of production. It is vital to the operation of any business, either small or larger scale (Mazzone, 2006). An organization will hire the employees that have necessary expertise, judgment, and skills in their job scopes in order to maximize the efficiency of the organization (Lowry, 2007). That is why the company can increase the potential of earning more profit and remain in the industry for years.

2.4 Intellectual Asset and Knowledge Asset

Intellectual asset is a formalized, captured, and leveraged form of intellectual materials that can generate more value for the company (Sealy, 2005). Organizations nowadays give more priority to the management of intellectual asset, the efforts on how to manipulate it for better use, and also recognizing the role of intellectual asset in marketplace success (Jalil and Khavandkar, 2009). Intellectual asset can be classified into two components. First, a semi-permanent bodies of tacit and explicit knowledge that discussing about an organization, a person, and a task. Second, intellectual asset is the capital resources that enlarge this body of knowledge (Stewart, 1999). The classified components can produce such intellectual asset measures which are able to be used for research and investment (Massetti, 1999).

Knowledge is not only about a task, person, or organization, but it can be represented in various degrees of accessibility. Knowledge can be divided into two categories, which are tacit knowledge and explicit knowledge (Sherman, 2005). Tacit knowledge exists in human's mind and intuitions (Worthington, 2005). Explicit knowledge can be found in manuals, books, articles and journals, and often more accessible and understandable (Hisamitsu, 2000). For example, organization can have a manual that contain a job description which is readable and easy to understand. It can state the description on how to do certain job but the experience and "know-how" gained by the employee resulting in 20 years of job experience is difficult to

communicate and higher in value for the organization (Macmillan, 2001). It is important to make tacit knowledge explicit in order to share it with other employees within the organization.

Knowledge asset consists of any knowledge that own by a business and allow its business process to gain more profits and revenues (Stim & Elias, 2003). It also can be defined as the knowledge that contains in employees within an organization and enable to assist the organization to better improvement (Edwin, 2001). Knowledge asset is related to tangible assets but certain elements of it are differing from the elements of tangible asset. These assets may involve know-how, trust, experience, stakeholder relationship, and customer loyalty (Richmond & Lee, 2006). Knowledge held by people can be measured by putting a value of the knowledge within organization processes (Massetti, 1999). It is important to assess knowledge in order to determine the consequence of the knowledge asset and how the knowledge can be used to creates or adds value to the organization (Sherman, 2005).

There are several processes need to be managed in order to administer knowledge assets. They involve identification, analysis, comprehension of knowledge, and leveraging and protecting knowledge asset within an organization (Jason & Mazzone, 2006). The management of the knowledge could involve the understanding of the effect of its usage, barrier during the usage of the knowledge, and the planned actions to be utilized (Sealy & Worthington, 2005). The understanding of the limitations of the knowledge asset should be focused on as well as the benefits of using it (Lowry, 2007).

2.5 Intellectual Property

Intellectual property is where an individual is allowed to control the use of certain intangible expressions and ideas in a form of legal entitlement (Sherman, 2005). Intellectual property can also be defined as the intangible asset that resides in human mind in the form of knowledge and idea. For example, it can be in patents, copyrights, trademarks, and others (Arai, 2000). The expansion of general trend in exclusive rights law has become a phenomenon in today's environment. The purposes of it are to protect new types of subject matter like databases, to control the activity for every protected subject matter, to lengthen the duration of individual rights, and to put aside the restrictions and limitations in these rights (Lai & Edwin, 2001). Another trend that has become popular is to raise the number of intellectual property itself. This trend has led to the increment of patents and trademarks widely. Trademark in the designated law today can now be implemented in smells, shapes, colours, words, and even sounds (Levine, 2004).

2.6 Industrial Practice

There are few intellectual property management systems or IPMS that have been used by other organization. For example, an IPMS system has been used by Global Wafers Corp. or (GWC). GWC has faced several incidents in which their critical IP was compromised. It is a great lost for the company since those digital assets are very crucial to them. Based from their experience, there is a necessity to create an effective IP protection.

Below are several functions in their IPMS used by the company in order to protect and secure their digital assets and other IP related documents:

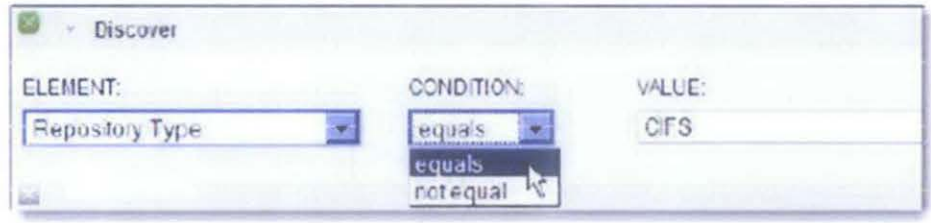

Figure 2.6i Search function by using repository type.

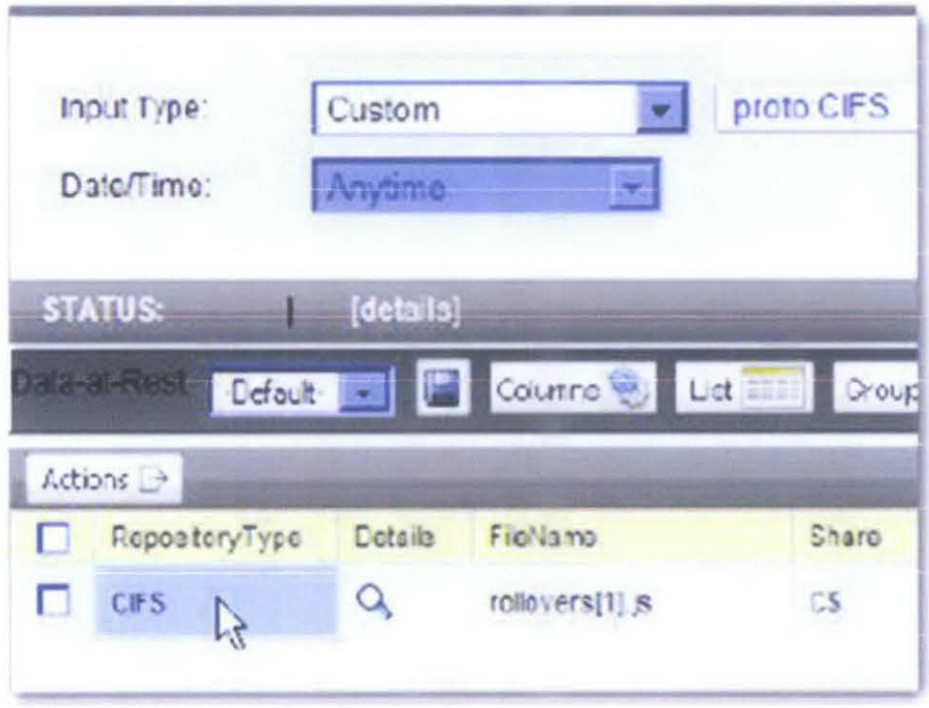

Figure 2.6ii Search result from users preferences.

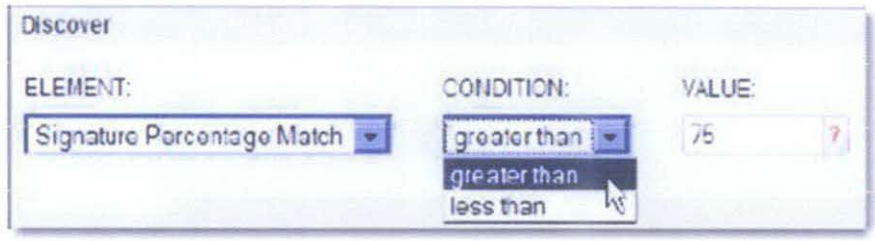

Figure 2.6iii Search function by using "greater than" and "less than" conditions.

The system used by GWC has several functions that are more extensive than what this project proposed. But on top of that, this project is intended to make the project for GWC as one of its references.

In the IPMS system used by GWC, the search function is very detail in which users can find their desired documents by key in the details. The condition that the system has like "greater than", "less than", repository type, author's details as well as upload date really help the users to narrow down their search for desired documents. In the other hand, another function that the system has is exporting the documents to user's email as well as other users' email. By simply key in the destination email, the documents can be sent out to the desired users'. This element is very helpful since many parties can involve in the discussion of the documents and also for reviewing purpose.

2.7 Summary

In this chapter, few terms have been introduced in order to make audience having a better picture on the intellectual property as well as its related area. This is very important in order to ensure that audience will have a good idea about Intellectual Property Management System (IPMS).

CHAPTER 3

METHODOLOGY

3.1 Introduction

Chapter 3 will describe the methodology that has been used in developing the IPMS. It will cover the planning phase, analyzing phase, designing phase, as well as testing phase. Each phase will be explained latter in this chapter. The methodology used in developing this system is Throwaway Prototyping Methodology.

3.2 Throwaway Prototyping Methodology

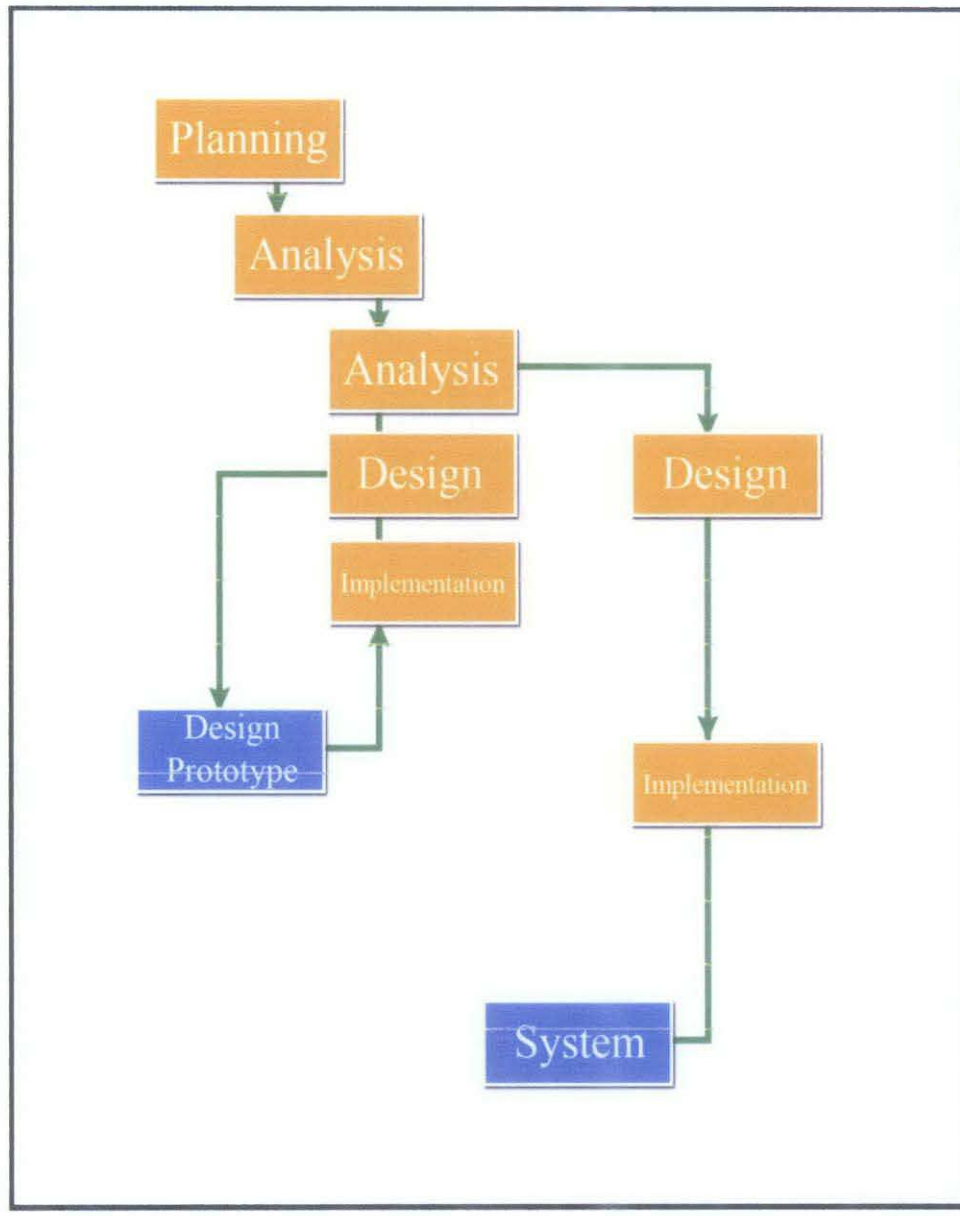

Figure 3.2 Throwaway Prototyping Methodology

Throwaway prototyping methodology is pretty much the same like the prototyping methodology where they include the development of the prototype. The key difference is that, in throwaway prototyping, the prototypes are done at a different point of System Development Life Cycle. Prototypes are used for different purposes and also they have a different appearance. This methodology has a thorough analysis phase that is used to collect information and to develop ideas for the concept of the system.

Developing a system might be challenging, because it may play around the technical issues, misunderstanding, and others issues. The processes that need to be gone through in order to overcome those issues are by analyzing, designing, and building a design prototype.

Design prototype is not a practical or working system; it is a product that represents a part of the system according to the requirements that have been draft out. The purpose of having a prototype is to enable users to understand the issues under consideration. By having a prototype also, users can know how much accurate the system, and enable them to add or drop certain features in the system. Example, the users are not clear on how an order entry system should work. The analyst team would then build a series of HTML pages and view it using a browser in order to help the users to visualize such a system. A series of mock-up screen would appear and look like the real system, but actually they really do nothing. Throwaway prototyping-based methodology balances the benefits of well-thought analysis and design phases with the advantages of using prototypes to refine key issues before a system is built. It may take longer to deliver the final system as compared with prototyping-based methodologies, but the approach usually produces more stable and reliable system. The development of this application system would be based on this methodology and most of the phases are achievable under the feasibility of time.

3.3 Initiation

Initiation phase begins with the identification by the project developer towards a need or an opportunity. The need is identified by recognizing the relevancy of having a system that could be developed in order to fulfil the flaws from existing systems. The relevancy of the project is to familiarize the intellectual property environment towards the employees in an organization. The significance of this project is to protect the idea being generated by employees before it could be presented outside the organization. This practice is very essential since today's technology allows people to steal any documented idea through certain means. A proposal is created in this initiation phase containing the objective of the project, the summary of what the project is mainly about, the problem that could be state based from the analysis earlier, and the skill and technology that could be needed in order to develop such system.

3.4 System Concept Development

The scope and boundary of this web-based system will be defined in this phase. All the details regarding cost benefit analysis, feasibility studies, and risk management plan will be discussed. The reason of these studies is to ensure the efficiency of this application system throughout its development timeline. Every single report will determine the competency of future prototype and either it is fulfilling user's requirement. Studies like feasibility studies and cost benefit analysis will help the developer to examine the real cost involve.

3.5 Planning

The planning documents will be developed in this phase. Planning documents include the Gantt chart of the project, the timeline, the cost needed in this project, who is involve, a mock-up system, and future prototype outcome. The planning phase also is the time when the developer translates the scope of the project into practical plans on how to achieve it. The purpose of the planning phase is to describe the solution that has been discussed in detail with the approved project plan and schedule. There are several tasks in planning phase. They are:

3.5.1 Developing the solution design and architecture

The design process will be developed that consists of the solution design and architecture. Later it will be culminated with a design document that will be part of the functional specification.

3.5.2 Creating functional specification

This task will include a functional specification that describes the solution requirements, its architecture, and the detail design for the features. This task will be the bridge between the user and the developer.

3.5.3 Creating the project schedule

The developer will create milestone-driven schedules for the time taken to develop this project and each role.

3.5.4 Close the planning phase

Planning phase will be completed along with the approval process for the project plans.

3.6 Requirement Analysis

Requirement analysis will involve the activities like collecting the user needs and requirements. A study will be made regarding the purpose of this project of one or more particular organization. Information collection will be done by interviewing the user in an organization, study the taxonomy of the organization, and by reading the annual report with regard to this patenting and protecting issue. The best way is to interview expert in this area and ask for its requirements.

3.7 Analyzing

In analyzing phase, there are some data collection activities that have been done. These activities include the system that is currently used by other organization like Dell, Schlumberger, as well as Intel.

In the other hand, an interview had been done between the developer and one of the PETRONAS Carigali Sdn. Bhd. staff in Knowledge Sharing unit. The purpose of this interview is to find what their current practice in the organization is. By knowing the practice, it is easy for the developer to design the features of the system as well as its functionalities.

Further activities in this phase include the designing process of every workflow of the system, the database connections or links, as well as system architecture.

3.8 Designing

In designing phase, it involves the development of the interface of the system as well as the functionalities that it carries. The design should be based on the requirement or the suggestions from the interview session on the previous section.

The best design that has been suggested should be simple and easy to understand by the users. In the other hand, the interface should be able to minimize the action that will be taken by the user. For example, for a user to upload his documents, the user can find easily the section that he needs to go from the homepage. The simplicity of the interface should be kept since one of the purposes of the system is to ease the user's system usage.

3.10 Testing

The purpose of testing phase in IPMS is to test the functionality of the system. This process allows potential user or tester to run the system. For this project, the targeted user or tester is an Executive from Knowledge Sharing Unit, of PETRONAS Carigali Sdn. Bhd.

In the other hand, the main purpose of this testing is to ensure the system that has been developed is meeting user's requirements and needs. It is important for the system to be tested before it can be released. Any dissatisfaction from the tester will allow the developer to make some amendment to the system before its final release.

3.11 Tools

- Joomla development kit.
- XAMPP server for local hosting.
- Microsoft Excel 2007.

3.14 Gantt Chart

WEEK / DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Conducting research														
Preparing project proposal														
Gathering sources														
Initiating project documentation: • Problem statement • Literature review • Methodology														
Proposal defence														
Gathering requirements from expected user through: • Interview • E-mail • etc.														
Sketching diagram designs														
Compiling diagrams														
Submit interim report														
Amendments														
Submit full report														

Figure 3.14 Gantt Chart

	September, 1 – 7	September, 8 - 15	September, 16 - 23	September, 24 - 30
Database structure				
System flowchart				
Concept design				
System architecture				
System flow				

Design phase of the development of IPMS

	October, 1 – 7	October, 8 - 15	October, 16 - 23	October, 24 - 31
Log In page				
Home page				
Upload function				
Delete function				

	November, 1 – 7	November, 8 - 15	November, 16 - 23	November, 24 – 30
Download function				
Search function				

Development phase of IPMS

3.12 Summary

Chapter 3, Methodology gives some overview to the audience on how the system is developed. It includes what is the methodology been used, what are the steps of the project development, what is the expected outcome, explanation of the system architecture, as well as the system flow. This chapter hopefully could help the audience in understanding the development of the system that runs from the back.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Introduction

In this section, there are several activities involved like questionnaire, diagram drawings, as well as interface explanation. The purpose of the survey is to find the necessity of the potential users in which a set of questions have been prepared and given to the audience.

4.2 Questionnaire Analysis

A set of questions has been made regarding to the topic of Intellectual Property. There are 20 students involved in this activity. The purpose of this activity is to find whether the system is necessary for the student as a future employee. There need to put themselves in a worker shoes once they are employed. It is essential since Universiti Teknologi PETRONAS (UTP) is an institution that promotes engineering as its main core. Among students in UTP, there are quite a number of young innovators and inventors. That is why they have been targeted as the audience in this survey activity.

1. ***Do you understand the definition of Intellectual Property?***

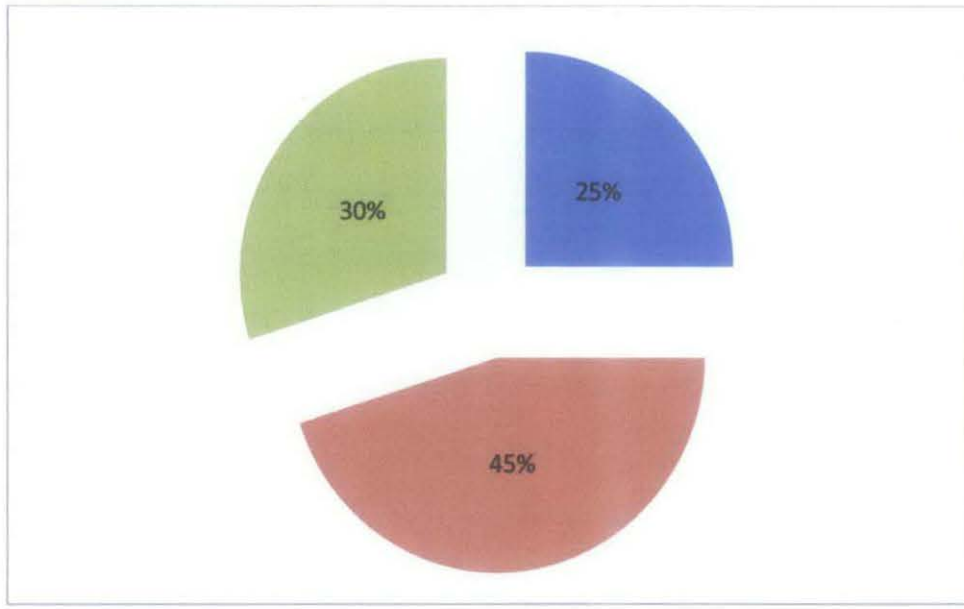

Figure 4.2i Question 1

This question intended to ask whether the correspondences are aware about the definition of the Intellectual Property (IP) or not. Based on the result, as much as 25% or 5 people out of 20 are well aware about the definition and concept of Intellectual Property. Those correspondences perhaps know the basic definition of IP and know how it works. 30% or 6 people are not very sure about the concept of IP and have a surface knowledge of IP. In the other hand, 9 people or 45% of the correspondence are not aware about IP and never know its concept.

2. *Can you identify the purpose of Intellectual Property?*

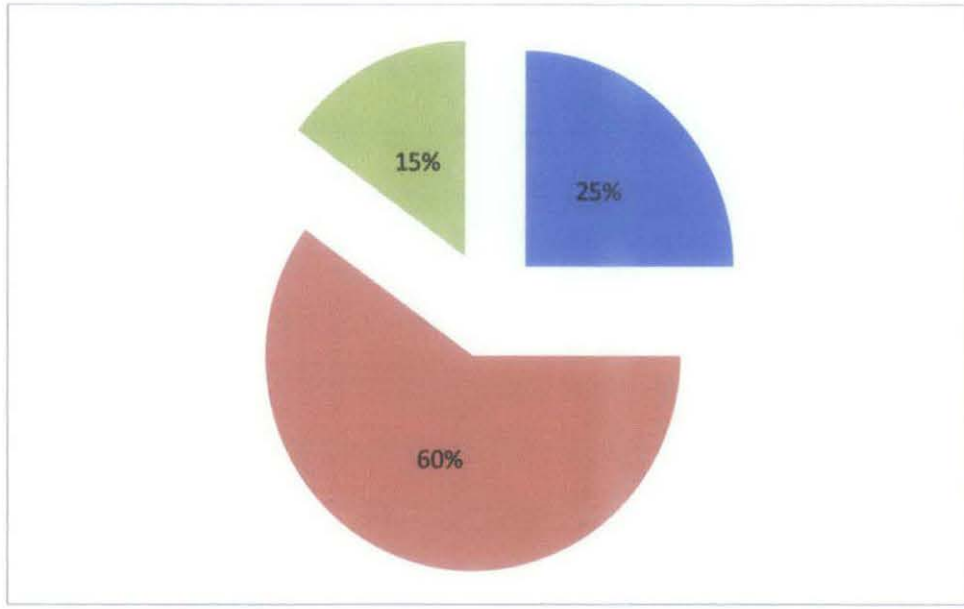

Figure 4.2ii Question 2

Second question that has been asked is about the purpose of IP. Correspondences are asked whether they know the purpose of IP or not. This basic concept is essential in making sure that they know what IP is all about. From the pie chart, 60% or12 people answered no. The correspondences with this answer might not get or understand the purpose of IP as a whole. They also might never get exposed to such practice of IP and its environment. 25% or 5 people know the purpose of IP meanwhile 15% understands the purpose of having a good IP practice.

*3. **Have you ever invented any product?***

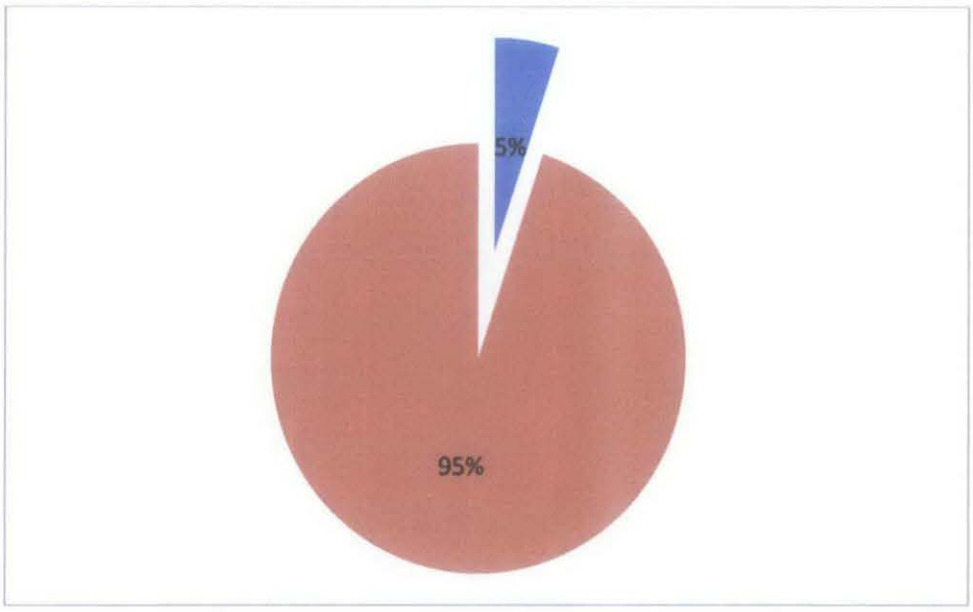

Figure 4.2iii Question 3

This simple question asked about whether the correspondences have invented any kind of product or item. 95% or 19 people out of 20 said they never invented any product. In the other hand, there are only 1 people or 5% that invented a product. This result shows that not many students in UTP care about inventing any products. The assumption that can be made is they might pack with their class timetable as well as their assignments and projects.

4. ***Do you have any workable idea that you think can be sold to other party?***

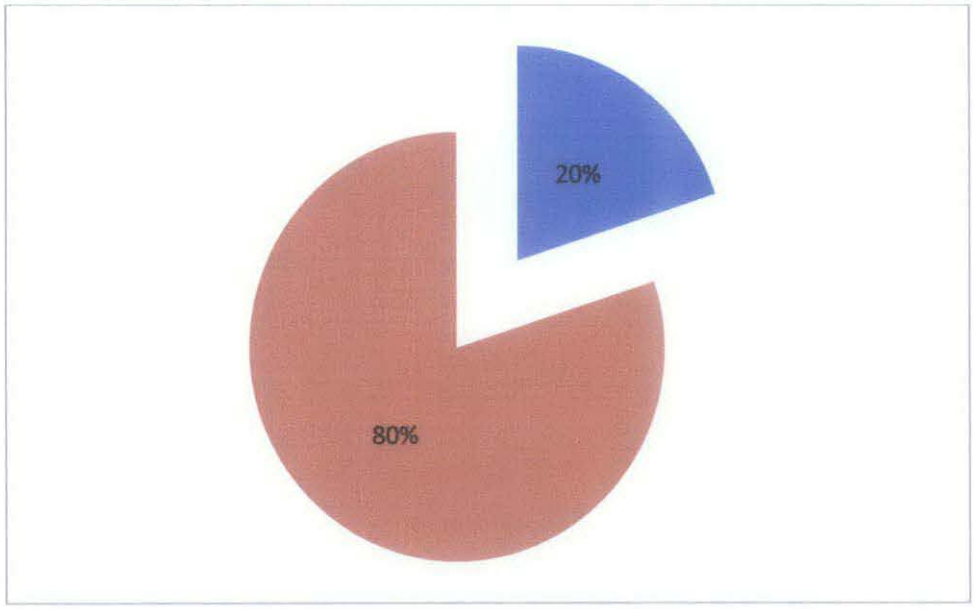

Figure 4.2iv Question 4

20% that consists of 4 people have a brilliant idea in which they think they can sell it to others. The idea might be very helpful in which it is very useful for such a development. In the other hand, 80% of the correspondences don't have good idea to be sold to other party. Perhaps the idea is only for the personal use and not to the extent of other people usage. This question intended to know whether students can generate any idea that might be very helpful for other people.

5. ***If you have an idea that can be patented, do you think a system might be useful and could help you to decrease the procedure time of your patenting activity?***

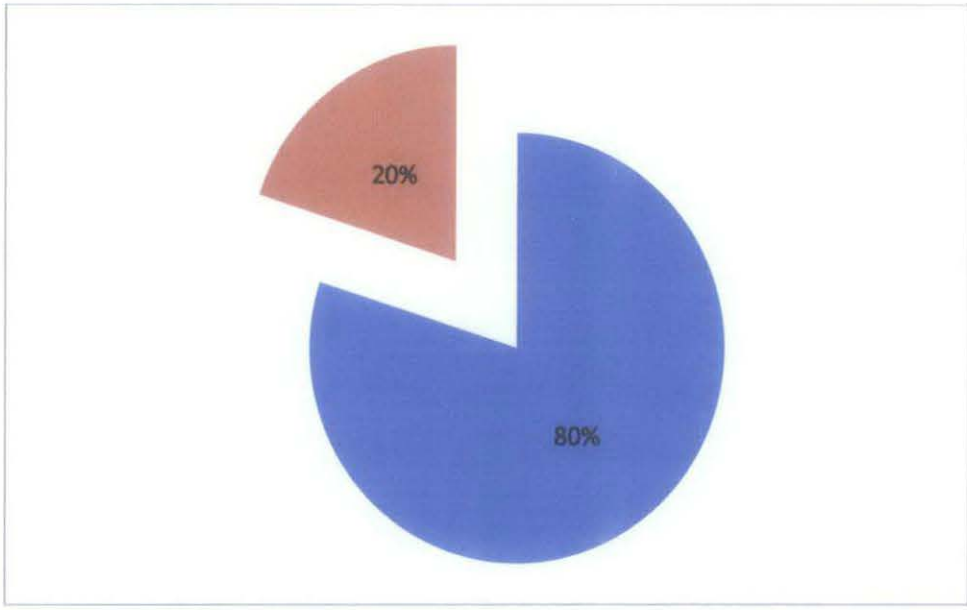

Figure 4.v Question 5

The purpose of this question is to know whether correspondences are willing to have a system that might help them to fasten their patenting procedure internally. The meaning of "internally" is the procedure that involve internal party like the administration of the university, approval from the university, as well as the application procedure within the university. 20% or 4 people disagree that a system could them to achieve that. Perhaps this group of people are still thinking that the traditional way is better than having a system. Meanwhile, 80% of the correspondence or 16 people out of 20 are willing to have a system and they think it is relevant to have such system.

6. ***Do you prefer to sign up your patenting application online or on paper?***

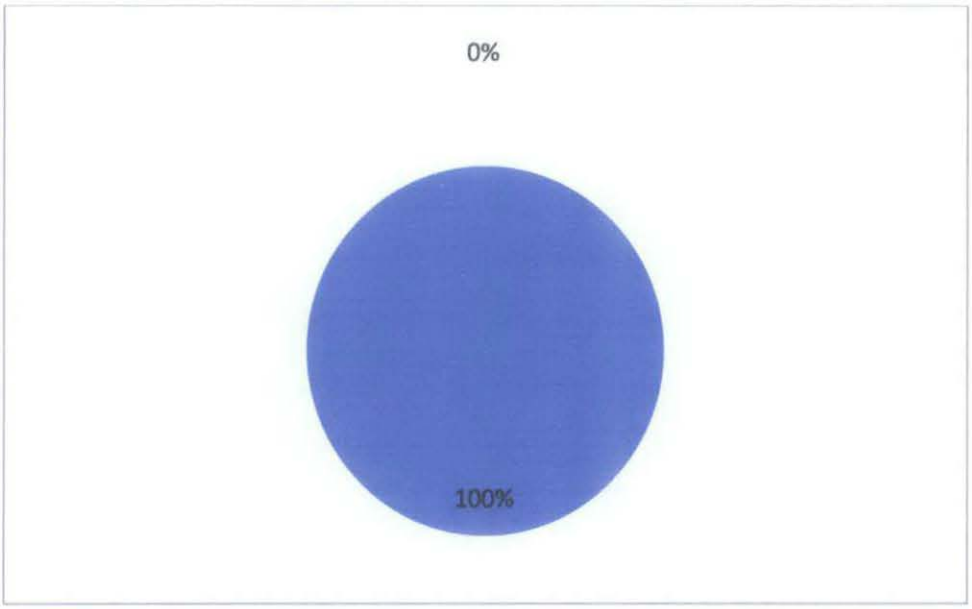

Figure 4.2vi Question 6

This direct question is mainly about the correspondence's perception about two different ways of application. Given options are online and on paper. Based on the result, 100% or all the correspondence agreed to the usage of a system in helping them to patent their idea internally. It means that, the correspondence agrees that an online application could be very helpful for them.

4.3 Overall Overview

This overall overview gives the audience a clear picture on how IPMS will work and who are the subjects that will involve.

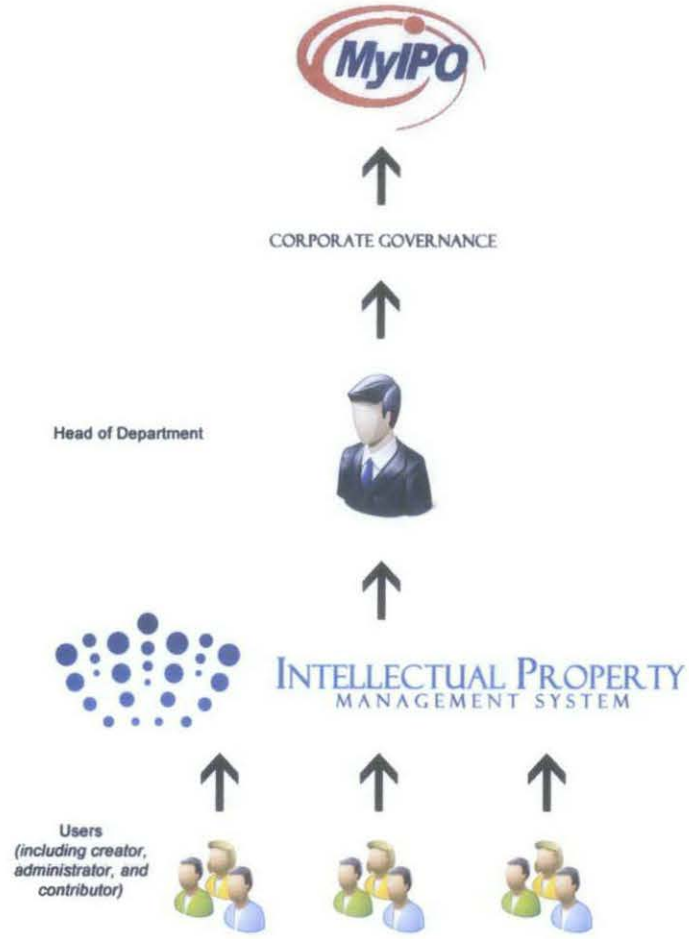

Figure 4.3 Overall Overview Chart

In the above diagram, shows a brief idea on where the IPMS reside within an organization. The diagram is easy to understand in which it shows subjects that involve in the process of patenting users' idea or work. Starting from bottom, the icon represents the users that will use the IPMS system. Users will interact with the user interface in implementing several functions like upload, download, search, and delete documents. The connection between the

IPMS system and the users is very clear in which both subject interact directly to each other.

In the other hand, once the documents have been uploaded into the system's database, user's head of department will filter the documents in order to determine whether the idea is suitable to be patented or not. In this level, a close inspection will be done in which the head of department will analyze the documents to check whether it is someone else's idea or it is original from the user. Apart from that, the head of department will determine the originality and applicability of the paper work (idea). If it is applicable, the users will be given a notification in which they will be asked to fill in some forms, online, before the paper will be sent to the corporate governance of the company. The corporate governance division is chosen since this division is the one who will manage and control all the laws and procedures within the organization. Apart from that, this division also will interact with outside party in any occasion with regard to the laws as well as procedures that may involve its employees.

Corporate governance division will interact with the outside party; in this case, it is Intellectual Property Corporation of Malaysia or MyIPO. Any procedures that may involve the users and MyIPO will go through the corporate governance division. Once the paperwork has been granted a license to be patented, MyIPO will directly contact the corporate governance division and it will go back to the users.

The Significance

This system helps to overcome few drawbacks of practicing traditional way. The current practice that is currently used involves pen and paper, and more papers. Applicants need to fill in a 5-page form (more or less) and it will involve more papers in the future. Based on current trending of this technology era, the head of departments can simply download the paperwork and copy them to their tablet or smart phones. They can view and read the paperwork anywhere even at home. From there, the head of department can cut the time of reading the paperwork. When the paperwork is on a paper, they can't bring back a bundle of papers anywhere, surely because it is heavy and messy.

4.4 Context Diagram

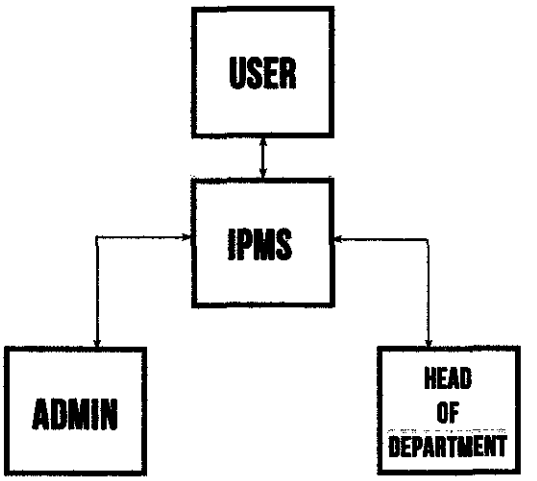

Figure 4.4 Context Diagram of IPMS that consists of user, admin, and head of department

Figure 4.4 demonstrates a context diagram of IPMS. It consists of user, admin, as well as head of department. Every party have their own limitation and role that will be played. Within the organization, these three parties are the ones who will be the backbone of IPMS.

User Includes people within the organization that will contribute to the system. They upload their desired documents, download any documents, delete their documents, as well as view other people works. Their limitations are approving other users' application and manage the backend of the system.

Admin Or administrator are the ones who manage the backend of the system. The roles of admin are approving new application, manage the files or documents, sending notification, maintain the environment of the system, as well as creating new functions for the system.

Head of Department Will view the papers that have been uploaded in the system. HOD will filter the documents in searching for the papers that are potentially can be patented by the organization. HOD plays a significant roles where they are the ones who will be responsible to determine the right papers to be brought to MyIPO. HOD is the middleman between users and corporate governance office of PETRONAS Carigali Sdn. Bhd.

4.5 Use Case Diagram

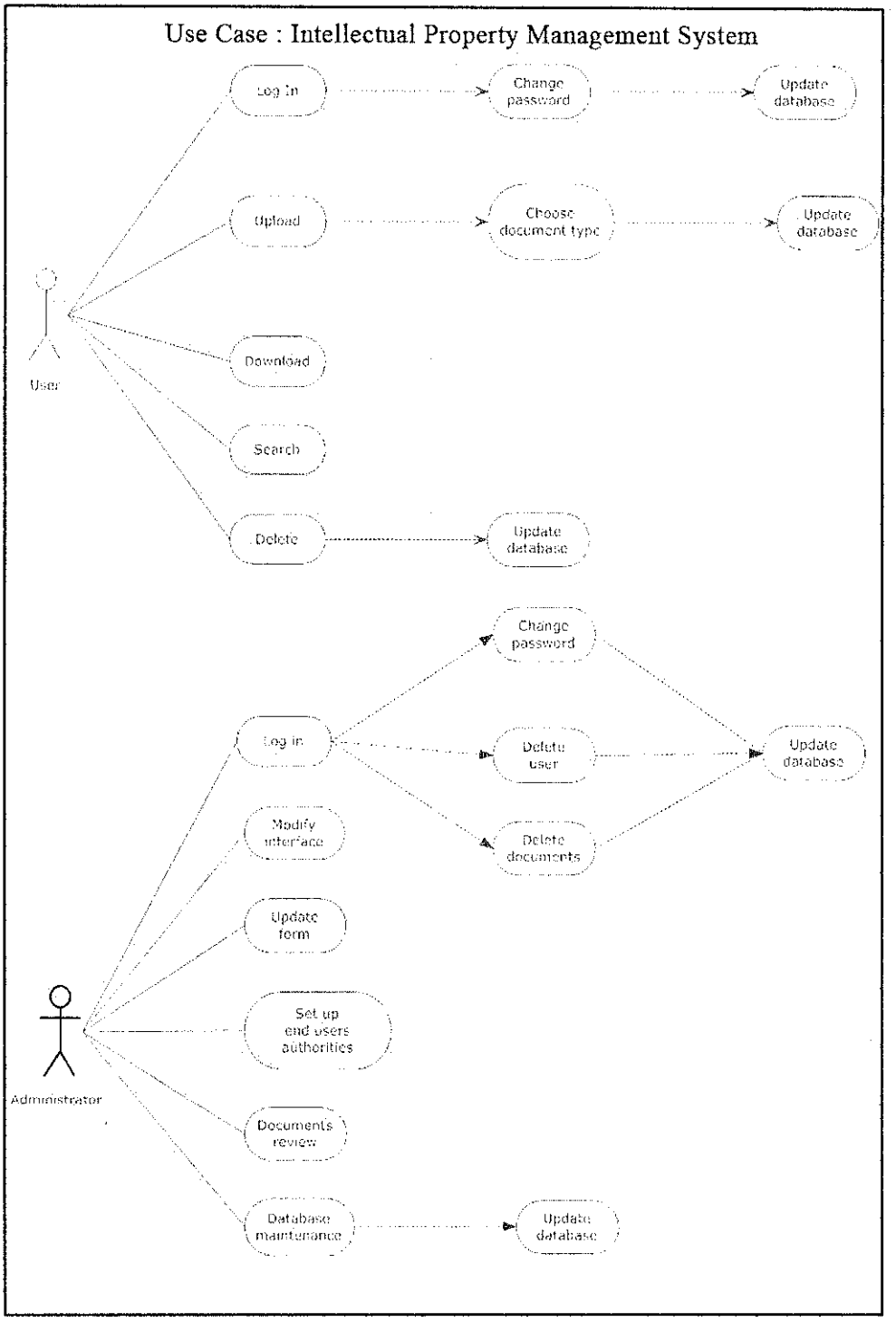

Figure 4.5 Use Case diagram of IPMS

Figure 4.5 depicts the use case diagram of IPMS. The actors include "User" and "Administrator". For User and Administrator, they have their own activities.

User User's activities includes log in, upload, download, search, and delete. These are as well the functions within the system. Once the users have registered, they need to log in with the registered user name and password. At any time, the users can change their password and at the same time, the database of IPMS will be updated as well. When the users want to update their files, they have to choose which division they are in. Once the files are successfully uploaded, the database will again be updated. Users also can download other peoples' files for reference and can search in order to narrow down to their specific desired files. In the other hand, users can also delete their files at any time if there is any intention to do that.

Administrator Own several activities that manage the backend of the system. Once the admin logged in, they can change user's password if the user desired to do that, delete the user if the user has breached the protocol, and delete the documents for several purposes like containing viruses or thrash documents. Once these activities have been done, the database will be updated automatically. In the other hand, other responsibilities of admin are modifying interface if they desire to do that, update the form within the system, set up users authorities, review the files, as well as maintain the database. These are crucial to the admin in making sure the system will run smoothly.

4.6 Class Diagram

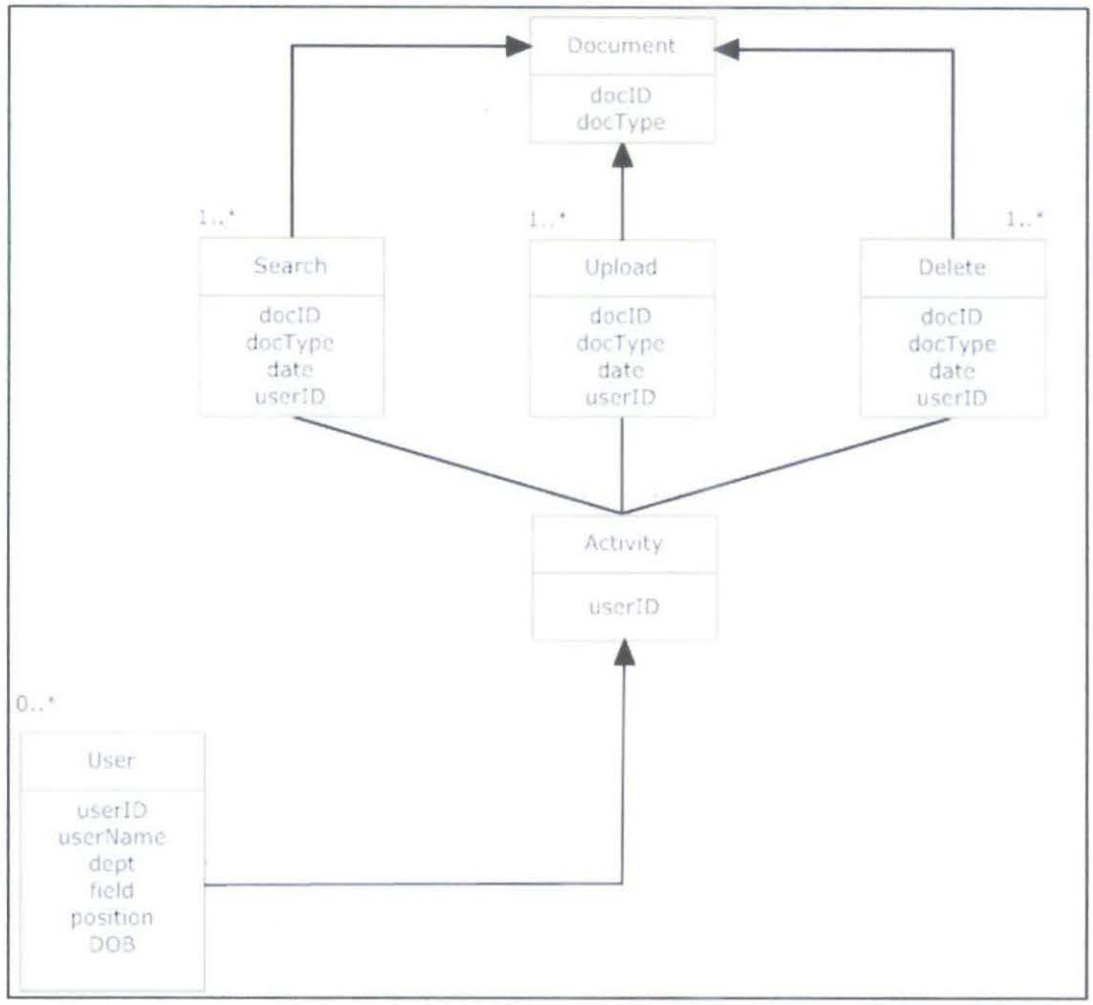

Figure 4.6 Class diagram

Figure 4.6 depicts the class diagram of IPMS. It has several classes include user, search, upload, delete, as well as document. The attributes contain in user class are userID, userName, dept, field, position, and DOB. Activity class is inherited from the user class and it contains userID attribute. There are three other classes that are prolong which are search class, upload class, and delete class. All these classes consist of docID, docType, date, and userID. The relationship between these three classes is connected to the document class that contain the attributes of docID and docType. The relationship between these three classes to the document class is one to many.

4.7 Entity Relationship Diagram

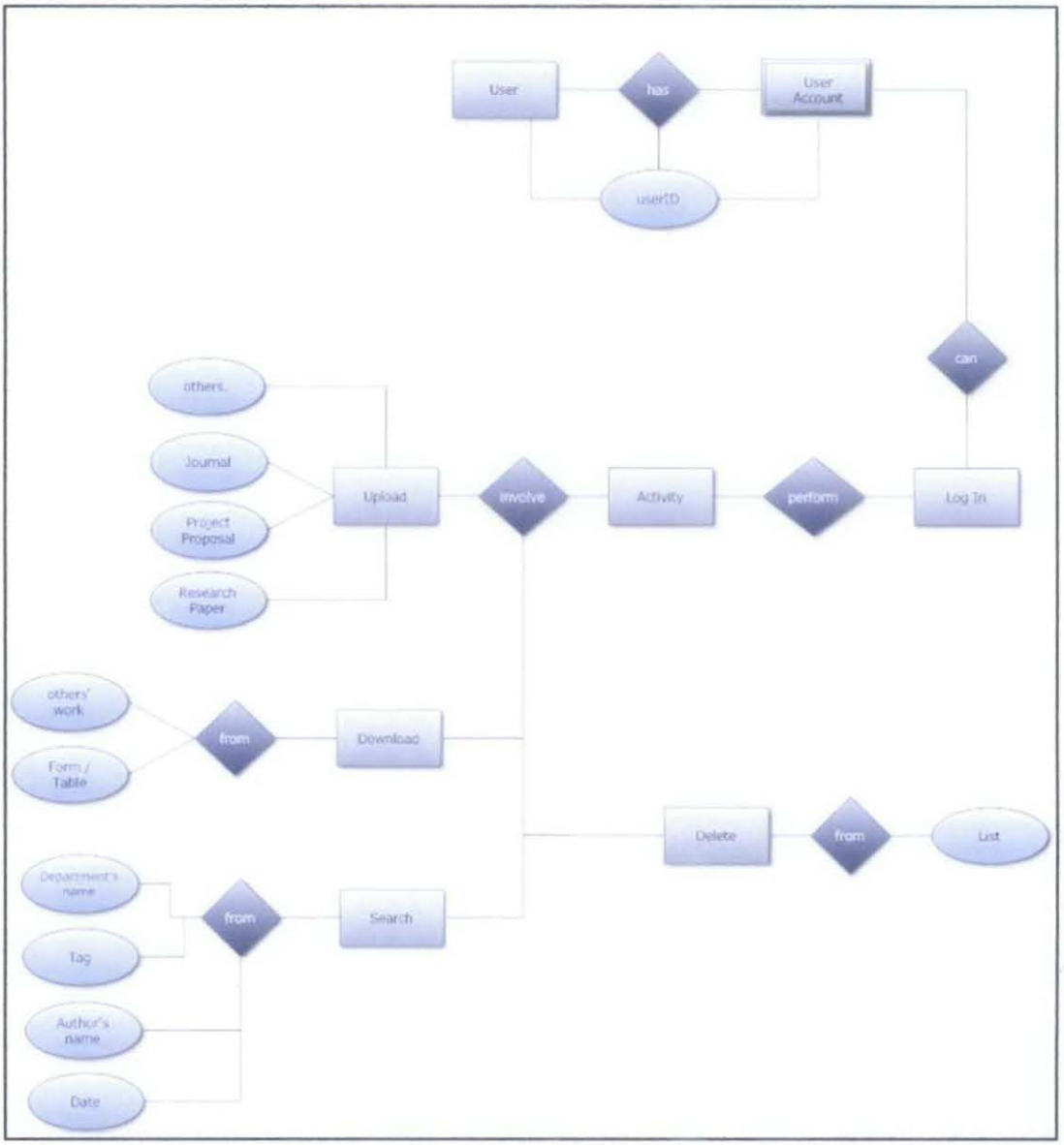

Figure 4.7 Entity Relationship diagram

Figure 4.7 shows the entity relationship diagram of the IPMS. It has four activities include log in, upload, download, search, and delete. User needs to have an account in order to log in into the system. Once the user has logged in, user can perform the activities mentioned earlier. When the user uses the upload activity, they can upload several types of documents like journal, project proposal, research paper and others. Download activity allows user to download other users' files. When using the search

activity, users can narrow down their searching by key in the details like department's name, by tag, author's name, as well as uploaded date.

4.8 Prototype

IPMS have been developed using an open-source Content Management System or CMS, which is Joomla. The development using Joomla gives full opportunity for the developer to create a whole new environment for user experience. In the other hand, the coding patent of Joomla is widely known and easy to learn by any developer and programmer, if let say a new developer wants to add some other features in this IPMS system.

Figure 4.8 IPMS Homepage

Upload

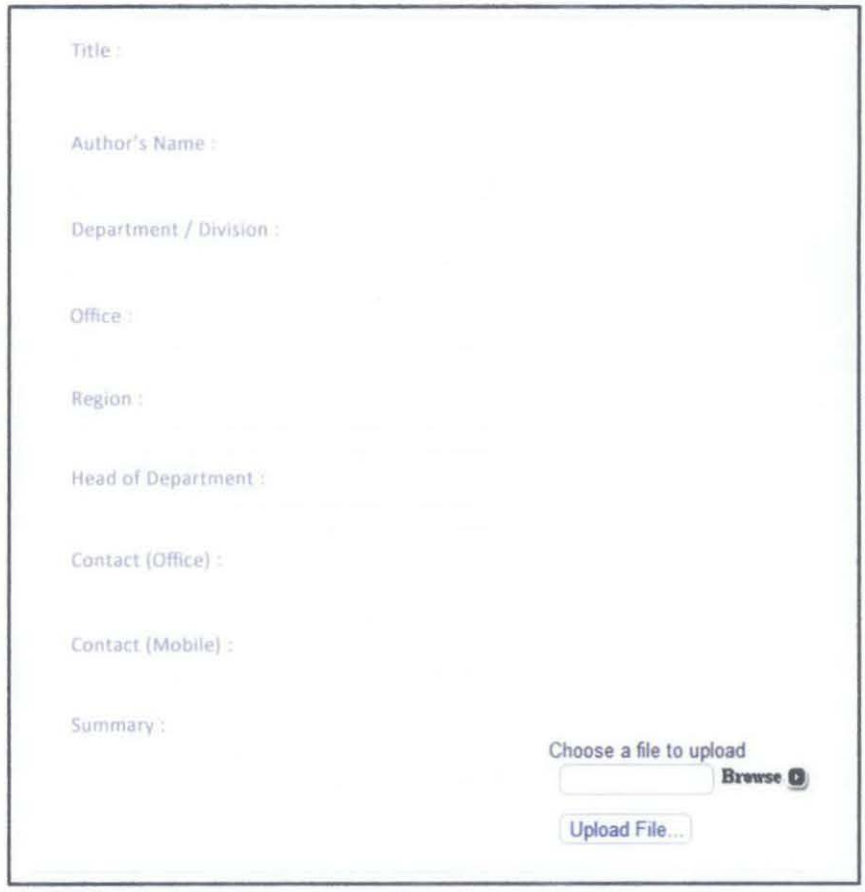

Figure 4.8i Upload

Whenever users want to upload their documents, they can simply go to this direction from the homepage:

- Directory
- "Choose Division" either Deepwater, Drilling, Exploration, Production, Subsea, or Subsurface
- Key in the details
- Browse the file
- Click "Upload File" button.

Download and Delete

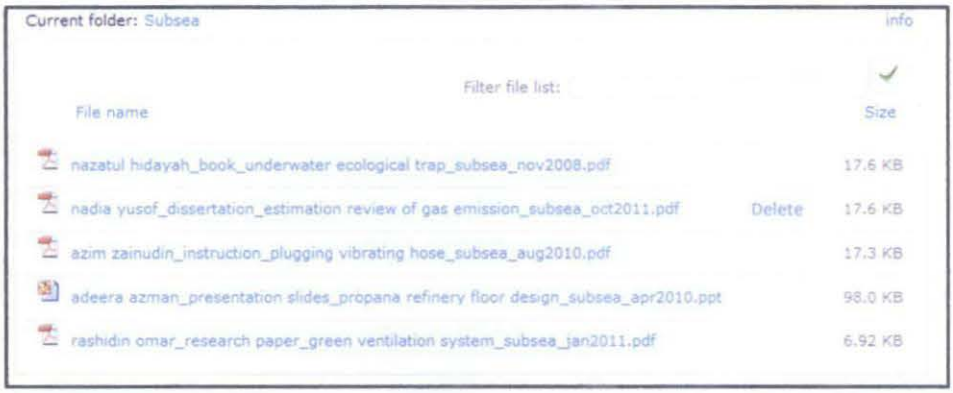

Figure 4.8ii Download and Delete

From the homepage, users can go to:

- Go to "Directory"
- "Choose Division" either Deepwater, Drilling, Exploration, Production, Subsea, or Subsurface
- A list of documents will appear
- Click on any filename to download or;
- Click on "Delete" button at the end of the filename to delete *(applied for the owner of the file only)*

Search

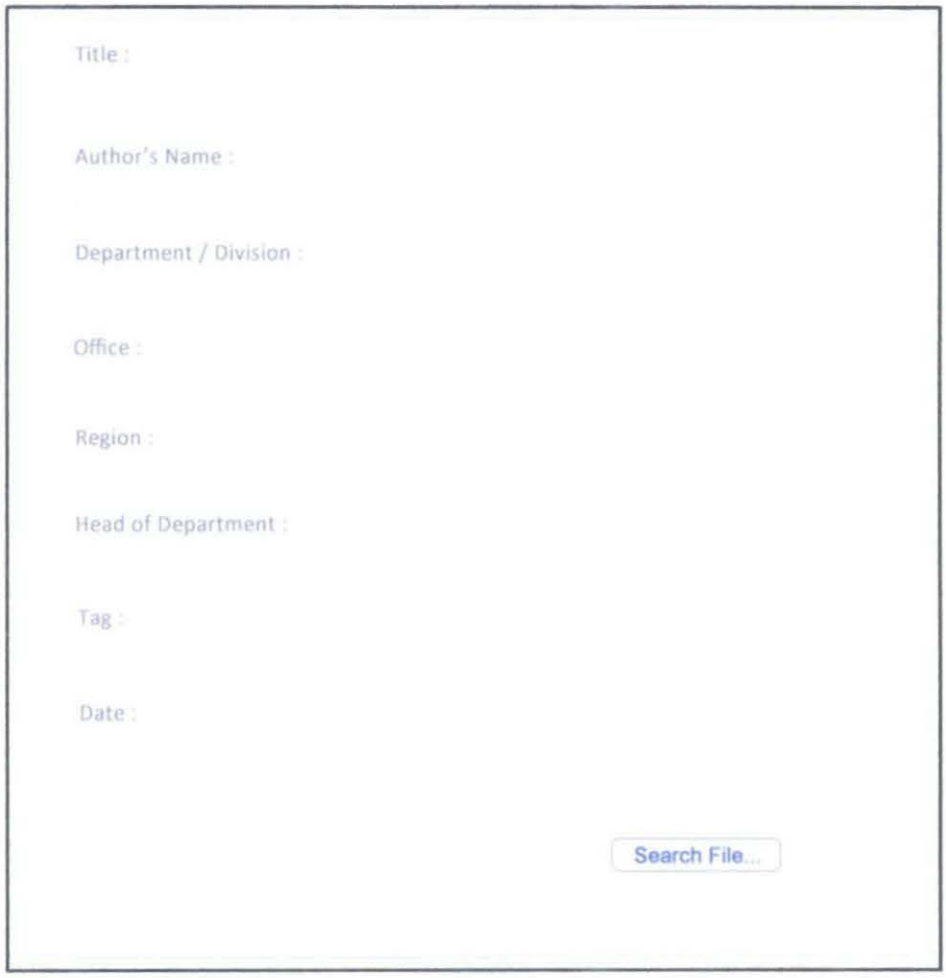

Figure 4.8iii Search

From homepage:

- Go to "Directory"
- "Choose Division" either Deepwater, Drilling, Exploration, Production, Subsea, or Subsurface
- Click "Search" tab
- Key in any details like title, author's name, or tag
- Click the "Search File" button

For the administrator, like the members of Knowledge Sharing unit as well as the Head of Department, they can manage the system through the backend of the system. Only the users with Special access level can access this system backend and they are meant to be the administrator.

Figure 4.8iv Control Panel or Homepage

Figure 4.8iv depicts the control panel for the administrator to manage the system. There are few functions that can be used in order to maintain the system including Access Level, Content Manager, as well as Menu Manager.

Figure 4.8v User Manager: Access Level

Figure 4.8v demonstrates the function that the administrator can use in order to set and determine users' access level. It is divided into three categories which are Public, Registered, and Special. Public is for unregistered user, Registered for users that have registered, and Special allows the users to access the backend of the system, in which they are the administrator of this system.

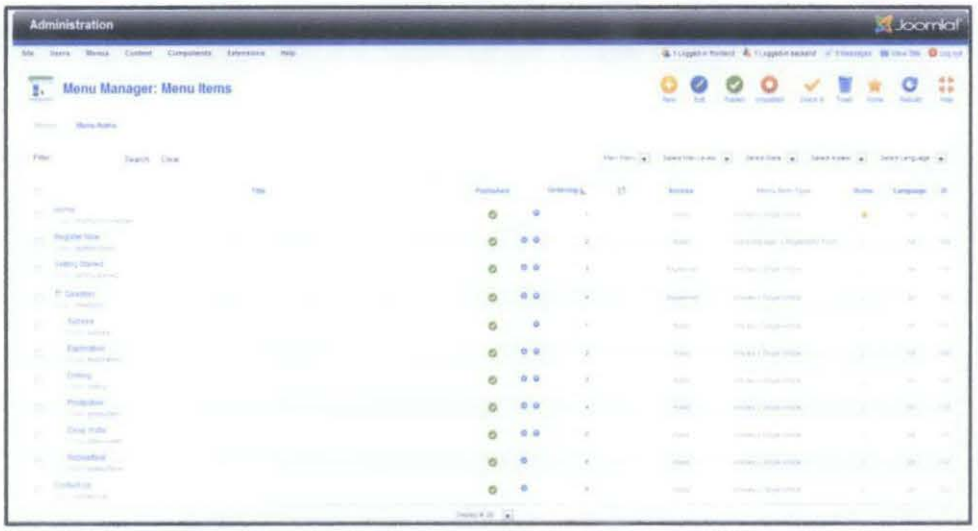

Figure 4.8vi Content Manager: Menu Items

Based on the Figure 4.8vi, administrator can manage the content of the system like to add new article, new functions, enabling and disabling the functions, as well as determine the access level of the content. Managing the content allows the administrator to update the system at any time according to changes.

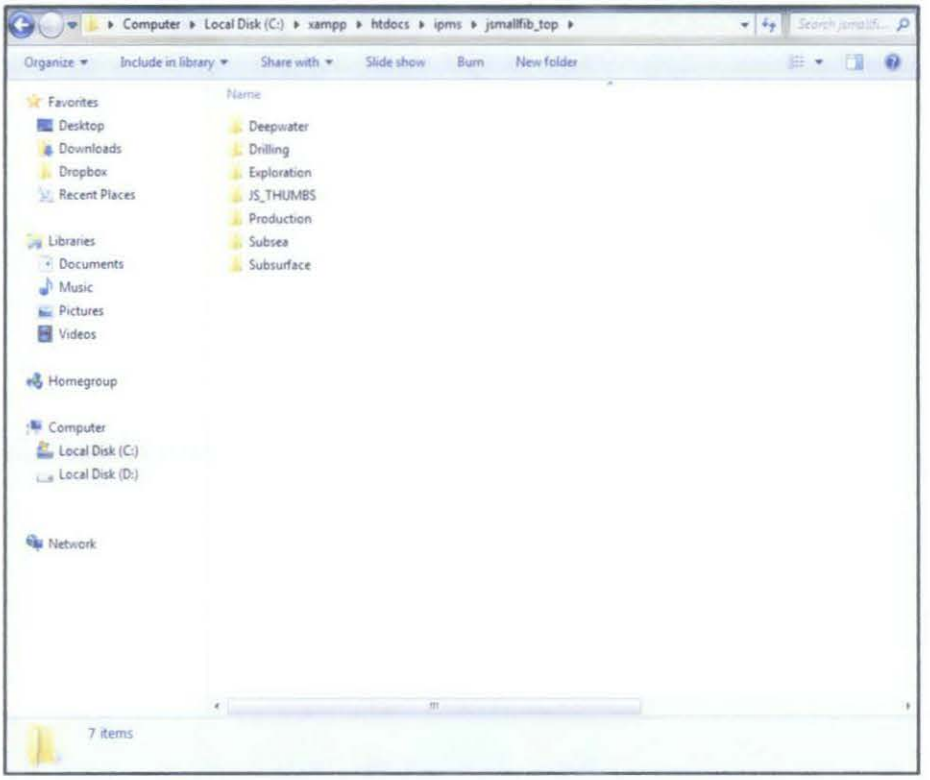

Figure 4.8vii Storing the uploaded files

All those files that have been uploaded will be stored within the folder storage that has been resided in the local folder. The folders can be found within the "xampp" folder in the local C drive partition. This folder shows that all the files are being stored by the localhost and it is located within the local drive. The path of the file is like the following:

Local Disk (C:) > xampp > htdocs > ***ipms*** > ***jsmallfib_top***

ipms and ***jsmallfib_top*** are the local folder decided by the developer. It can be anything but the path to reach the storage folder will be the same. It should contain two other folders within the ***htdocs*** folder.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

In this chapter, the hopes and recommendations for this project will be discussed. Before the system gets into its final touch, there are several matters that should be reminded back in order to achieve what has been discussed. The release of this system will hopefully help the targeted organization to have a better approach in handling the intellectual property matters.

5.2 Conclusion

Based on the objectives of this project, which are:

- Collecting ideas in tangible form before it can be proceed to be granted by MyIPO.
- Gathering all the ideas and justified by a body who will be supervising all the ideas.
- Collecting and gathering patented and pending request of files in organizations for future reference in intellectual property area. The system will act as a hub or intermediary in particular organization.
- Allowing users to search for related ideas that have been patented. This activity will be able to help users to check whether their idea or much alike idea has been produced by other people or not.

- Allowing the organizations to collect all the patented ideas and locate them in one place that are accessible to all for best practices and references.

Hopefully with the objectives that have been clarified in the early development of this project, this system will have better guidance in order to make it readily available.

With the planning of this project, it is expected to help the organization to reorganize back its current system. This project will give more benefits to the organization in many ways. It could cut the cost and time. These are the resources that should be concerned because they are a part of major resource in an organization. All the features that have been identified and the analysis that has been made could be a major guidance in proceeding with the project. Hopefully this project will help the organization to implement a better system in order to assist its day-to-day business operation.

Like has been discussed in the earlier part, this system helps to overcome few drawbacks of practicing traditional way. The current practice that is currently used involves pen and paper, and more papers. Applicants need to fill in a 5-page form (more or less) and it will involve more papers in the future. Based on current trending of this technology era, the head of departments can simply download the paperwork and copy them to their tablet or smart phones. They can view and read the paperwork anywhere even at home. From there, the head of department can cut the time of reading the paperwork. When the paperwork is on a paper, they can't bring back a bundle of papers anywhere, surely because it is heavy and messy. With the presence of this IPMS system, hopefully the burden can be put away and managing the intellectual property matters will be more intelligent.

5.3 Recommendation

This system has been developed based on the opportunity that the developer saw. The developer feels like there is some improvement that can be made from the targeted organization, which is PETRONAS Carigali Sdn. Bhd. Although the features are pretty basic, but it could helps to manage to improve the traditional way that has been using since long time ago.

The recommendation for this project in the future could be:

- More appealing and attractive user interface; perhaps it may includes live newsfeed, global news updates, as well as instant messaging features.
- Targeting small companies that promote innovation and invention; in which many of its employees keep producing new product or items. For example, companies like PETRONAS subsidiaries that supply the company technical stuff and chemical solutions.
- More functions within the system like forum, comment, as well as notification system to the head of department.
- Include the safety functions in order to prevent any virus that contains in the documents spread away.

5.4 Summary

This chapter provides the wrapper of the contents as well as the recommendations that can be made in the future from various sources like lecturers as well as potential users. It is to hope that this system will help anyone who involve.

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