Image, File & Knowledge (IFK) Manager

by

Mohd Fadzrizal bin Kamaruddin

6513

Dissertation submitted in partial fulfilment of

the requirements for the

Bachelor of Technology (Hons)

(Information and Communication Technology)

JANUARY 2008

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Approved by,

_____
(SAVITA K.SUGATHAN)
Lecturer/FYP Supervisor

Universiti Teknologi PETRONAS
Tronoh, Perak
JANUARY 2008

CERTIFICATION OF ORIGINALITY

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

MOHD FADZRIZAL KAMARUDDIN

ABSTRACT

This report describes in detail about the author's Final Year Project named Image, File & Knowledge (IFK) Manager. The project is proposed to one educational software developer in Kuala Lumpur. Its main objective is to develop a system that is used to systematize and centralize files according to their categories. The aim is also to create a forum as the medium for employees to discuss any job-related topics and share their ideas with each other. Recently, the company does not have a system to organize all images used in building up the software. Employees will put these images randomly in several folders inside the server instead of centralize them. Furthermore, employees in this company are not provided with a discussion tool which is very important for them to exchange their ideas, working skills, opinions and information. The author discovered that it was time consuming for the employees in Research and Development (R&D) Department to look for an image because they could not remember the exact location of the image since it is located separately inside the server. Observation is one method used by the author to gather every necessary data for this project. From his observation, trainees who are going to leave the company will hand over their knowledge such as working skills verbally to several new trainees. It is better if the company has a system that allows employees to share their knowledge continuously as the references to other people. Besides that, the author distributed a questionnaire to get some feedbacks from the employees regarding to the problems they are facing now. About 87% of overall employees are strongly agreed that it is very difficult to search for the image and the file while doing their routine works. The methodology used in this project is called Rational Unified Process (RUP) that is divided into four major phases; Inception, Construction, Elaboration and Transition.

Keywords: Content Management System (CMS), Knowledge Management System (KMS), images, document files, forum, knowledge, experiences, working skills, categorize, organize, capture and share.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE PROJECT

The idea to develop Image, File & Knowledge (IFK) Manager came up after the author discovered that the host company where he did his industrial training did not have a good system to manage all its images and document files properly. He also noticed that these images and files are not centralized and placed separately in several folders inside the server. Moreover, employees in this company faced some difficulties to share their working skills, information and opinion with each other since they did not have a method to do so. Therefore, employees are lacked of supports and references to complete their jobs on time. On the whole, this project is to develop one system that can resolve all problems as been mentioned earlier and propose it to the company or other multimedia company that produces educational software.

The author believed that these problems can be solved by implementing Content Management System (CMS) and Knowledge Management System (KMS) features in his system. When applied, CMS allows employees to organize those files systematically in one permanent location instead of their type, size and complexity. On the other hand, KMS has a technology called forum where employees can use it to conduct any discussion on a particular topic, exchange opinion or ideas and share their working skills among them. All information in the forum then will be captured in order that employees can always refer and read the information continually.

IFK Manager is called a Web Content Management System (WCMS) since it is a web-based content and knowledge management system. It is using the Client-Server Architectural Model where it has multiple of clients connected to the server which linked to the database. The system is accessible via the Intranet means that only employees of this company can use it. Hence, IFK Manager will be protected from outsiders who might abuse the system. Several other features such as Shout Out Box, News and On-line Poll are inserted in this system so that IFK Manager can be used to capture and share knowledge effectively.

1.2   PROBLEM STATEMENT

1.2.1   Images are not Well Organized and Centralized

In the host company, employees under Research and Development (R&D) Department use a lot of images in JPEG, PSD, PNG and GIF formats to develop the educational software. These images are stored in the server and shared to all departments in the company. But, they are not well managed and centralized. Employees love to keep them separately in many folders and subfolders or own computers. Therefore, employees could not look for the specific image faster when they wanted to use it and the searching process was time consuming. Content Management System (CMS) is the perfect solution to this problem. It has the ability to organize files orderly and centralized them in one permanent location inside the server.

1.2.2   Knowledge is not Capture and Share

Majority of employees in R&D Department are trainees who will leave the company after completed their industrial training. They did most of jobs in developing the software. Therefore, only they know how to solve some unique problems that might be encountered during the development process. These students did not have a method to record their new findings, problem solving techniques and solutions in words. Before leaving the company, they will hand over all their knowledge verbally to several new trainees. It is better if the company has a system that allows employees to share their knowledge continuously as the references to others. In this scenario, Knowledge Management System's (KMS) technology such as forum can be used to solve this problem. Forum gives employees an opportunity to do a group discussion on any job-related topic and share their views or opinion regarding the topic. All information in the forum will be captured and employees can refer to it continually.

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1.2.3 Ineffective Working Procedure

Files such as images and document files are located separately in many folders and subfolders within the server. Consequently, employees have to open these folders one by one in order to look for any specific image or document file. This procedure is time consuming because they did not know the exact location of that file. In addition, they faced some difficulties to categorize the image and the document file. To do so, employees must browse through several server shared folders before they can copy and put the file in its correct folder (category). CMS is well-known as a system that can organize files systematically by their categories. Employees are able to search them much faster and easier by using its integrated search engine. Besides that, employees do not have to browse server's shared folders anymore to categorize the files. IFK Manager will provide them with a simple user friendly interface to help employees to categorize those files.

1.2.4 No Discussion Tool

The host company did not provide any discussion tool for employees to do a group discussion or exchange ideas with each other. Recently, they must go and see the person face-to-face when they wanted to discuss any problem related to their job. The person is not always available for the discussion and might be busy to talk about it. Sometimes the employee is asking the same question to that person which already been asked by another employee in the past. To overcome this matter, the author is going to create a forum where employees in this company can use it as their discussion tool. They can discuss in detail about their job-related problems and look for the best solution for them in this forum. Besides that, a shout out box will be included in IFK Manager as an alternative tool for employees to have a real time chat among them.

1.3   OBJECTIVE

1. Perform a research on Web Content Management System (WCMS) and Knowledge Management System (KMS) features.

2. Develop a Web Content Management system which is used to centralize and organize files (images and document files) systematically in a particular location within the server.

3. Create a forum as the medium for employees to discuss any job-related topics and share their working skills with each other. Forum will capture all these and employees can use the search engine to search for the topic discussion.

1.4   SCOPE OF STUDY

1. Study the basic concept of Web Content Management System (WCMS), Content Management System (CMS) and Knowledge Management System (KMS) together with their main features.

2. Select the most suitable features to be integrated with IFK Manager so that problem statements of this project can be solved.

3. Develop a system to organize images and document files systematically in one central location so that employees can retrieve the files faster and easier.

4. Research and create one forum for IFK Manager so that employees can use it to capture and share their opinions, ideas, working skills and information with each other.

CHAPTER 2

LITERATURE REVIEW

2.1 WCMS CONCEPT

In this project, IFK Manager will be implemented as Web Content Management System (WCMS) since it is a web-based system. A system is called WCMS when it is purposely developed to operate on the web as a management system to control a large collection of web material such as images and document files, Wikipedia (April 2008). WCMS is integrated with Content Management System (CMS) that is used to create, control, edit and maintain the content. Moreover, WCMS is designed to allow users with little or no knowledge in website technologies to create and manage the content easily. Most of WCMS systems use a database to store the content. In this system, the administration is typically done through browser-based interfaces since WCMS is a website maintenance tool for non-technical administrators. WCMS's concept truly meets the author's objective to build up a web-based system that is used to organize a big number of images and document files systematically. For his system, the author would like to include a Knowledge Management System (KMS) in it so that IFK Manager can be functioned as content and knowledge management system too.

2.2   CMS AND KMS CONCEPTS

Rose Alinda Alias (2005) said that Knowledge Management System (KMS) is very important because it will help organization to have a competitive advantage and effective work through sharing and re-use of knowledge in an organization. Besides that, she claimed that KMS initiatives are used to systematically leverage information and expertise in order to improve organizational responsiveness, innovation, competency and efficiency. On the other hand, a CMS can make it easier to create and publish the content, to co-ordinate teams of authors and editors, to control branding and to reuse content across multiple channels (Graham Oakes, 2006). Their statements support the author's idea to build a system that applies both CMS and KMS concepts. By applying these concepts, images in the multimedia company can be organized systematically and employees' working skills can be re-used so that the work is effectively done.

2.3   CMS AND KMS FEATURES

Features of Content Management System (CMS) are ease of use, ease of navigation, security, searching, indexing, ease of access and platform independence (Balazs Halasy, 2005). Meso and Smith (2000) proposed that KMS components consist of technology, function and the knowledge by itself. In terms of technology, KMS should have the following features such as computer-mediated collaboration (CMC), e-mail, video conferencing, portal, search engine, intelligent agent and document management. They also said that in terms of its functionality, KMS involved processes for acquiring or collecting, organizing, disseminating or sharing knowledge and using knowledge among the stakeholder. Based on these facts, the author would like to include several appropriate features so that this system can work as been planned before and meets its objectives. Image, File & Knowledge (IFK) Manager is going to be equipped with search engine, ease of navigation, document management, security, forum and so forth.

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2.4 WITHOUT KNOWLEDGE MANAGEMENT SYSTEM (KMS)

Below are a few problems that might occur if a company does not have a Knowledge Management System (KMS):

1. New employees require a lengthy time to train themselves due to poor technical supports from other employees (Wikipedia, 2008). Normally, KMS is used to capture and share the knowledge such as working skills, problem solving methods, ideas and forth.

2. Knowledge sharing cannot be done effectively without KMS. In addition, it is very difficult to capture the knowledge since there is no appropriate method to do so. If KMS is implemented, employees can use the forum to make a group discussion, share information and exchange ideas.

3. There is no productivity improvement means that employees cannot improve their skills which will help them to accomplish their tasks more efficiently because they cannot share their knowledge and working skills with other employees (Liu, 2004).

4. When the most experience employee leaves the company, his or her valuable knowledge cannot be shared with other employees because there is no KMS. Therefore, employees will be lacked of references and supports if they encountered some odd problems.

2.5 WITHOUT CONTENT MANAGEMENT SYSTEM (CMS)

Without CMS, the content such as images, document files and other files will not be easier to handle. CMS allows non-technical users to easily manage their content (Gerry McGovern, 2002). Besides that, employees in a particular company will have some difficulties to search for a file if CMS is not implemented in the company. Normally, there are a lot of files to be managed and it is very difficult to seek the file without an appropriate system. The search engine in CMS can help employees to do the searching quickly and easier. CMS also is able to centralize the content. If CMS is not used, the content will be stored in many different locations inside the server and make it hard to find them.

2.6   KMS TECHNOLOGIES

2.6.1   Search Engine

In this system, the author decided to put in the search engine. It is the most important technology for the manipulation of explicit knowledge which helps people to find the knowledge. Since the trend in most organizations is for essentially all documents to become available in electronic form on line, the challenge of on-line access has been transformed into the challenge of finding the materials relevant for some task (A.D. Marwick 2001). Search engine will be used to look for a particular image or document file which is organized systematically inside the server. This technology is vital because employees can reduce their searching time and get a precise result.

2.6.2   Taxonomy

Taxonomies have been proved to be a popular way to build a domain model in order to help users to search and navigate. Its popularity is understandable as on-line tools become central to individuals' work. They naturally want to see the information displayed within a schema that reflects their own priorities and worldview. This trend is likely to lead to a proliferation of taxonomies in knowledge management applications (A.D. Marwick 2001). Based on Lars Marius Garshol (2004), taxonomy is a subject-based classification that arranges the terms in the controlled vocabulary into a hierarchy without doing anything further. The benefit of this method is that it allows related terms to be grouped together and categorized in ways that make it easier to find the correct term to use whether for searching or to describe an object. The author has decided to implement taxonomy in this system. He noticed that this technology is very suitable in organizing and categorizing all images and document files in IFK Manager. Normally, each file will has its own name and taxonomy can be used to categorize it based on the name itself.

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2.7   EXAMPLES OF SIMILAR SYSTEM

2.7.1   KnowledgeTree

KnowledgeTree is a document management system. It is easily secure, share, track and manage the documents and records of the organization.
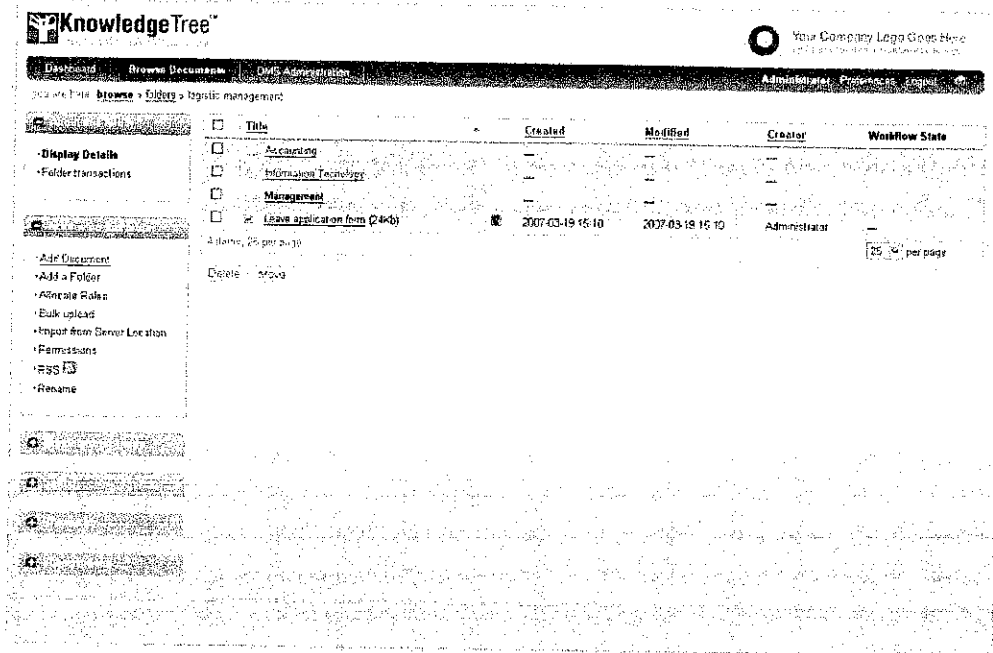

Figure 1: KnowledgeTree Screen Shot

KnowledgeTree features:

- Easy to Use Web and Microsoft® Windows® Interface
- Search within Document Contents or Metadata
- Access to Documents from within Microsoft® Office® Applications
- Available in over 20 languages
- Extend Using Web Services or our PHP API

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2.7.2 kManager

It is a knowledge management software platform for managing the multiple knowledge management functional needs of an organization and other business partners in one location, kManager. This system allows the user to create an unlimited number of document repositories with version control for multiple attachments.
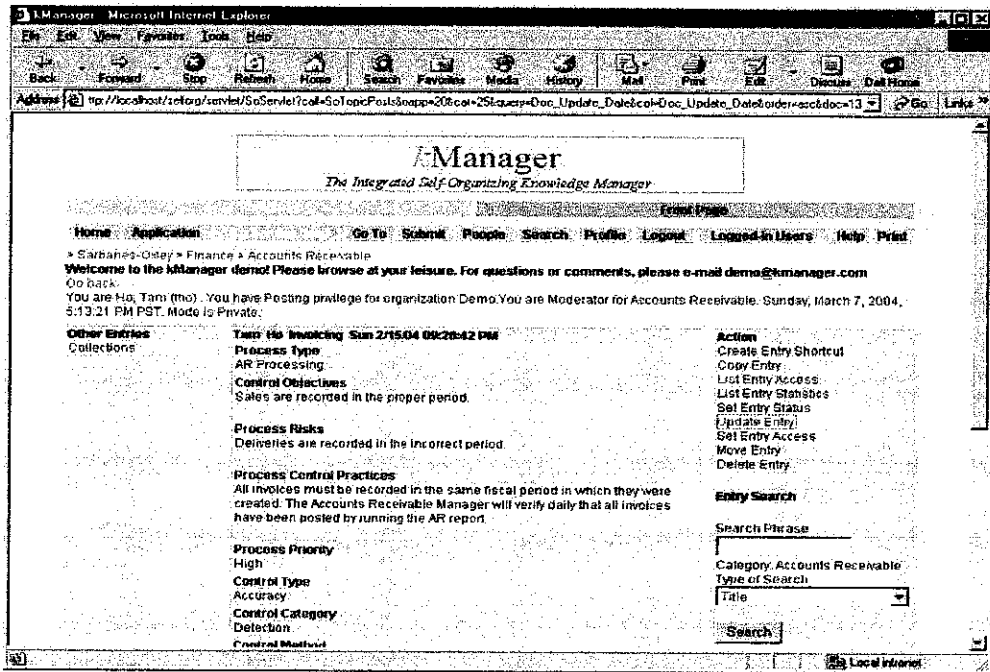
Figure 2: kManager Screen Shot

kManager features:

- It has several discussion forums which can be bookmarked and monitored.

- It provides a unique way to share files using a web browser.

- It uses extensible templates to provide any number of knowledge base areas as required.

- It comes integrated with a search feature that provides specialized search across all kManager knowledge management application templates.

- This system can be used to search for people across an organization based on their profile information.

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2.7.3 General Knowledge

General Knowledge is a knowledge management system. It is easy to use and provides an effective way to manage all types of knowledge bases. It has an intuitive user interface. In addition, it is simple to create, capture and store the documents in one location. This system also allows the user to retrieve the document faster.
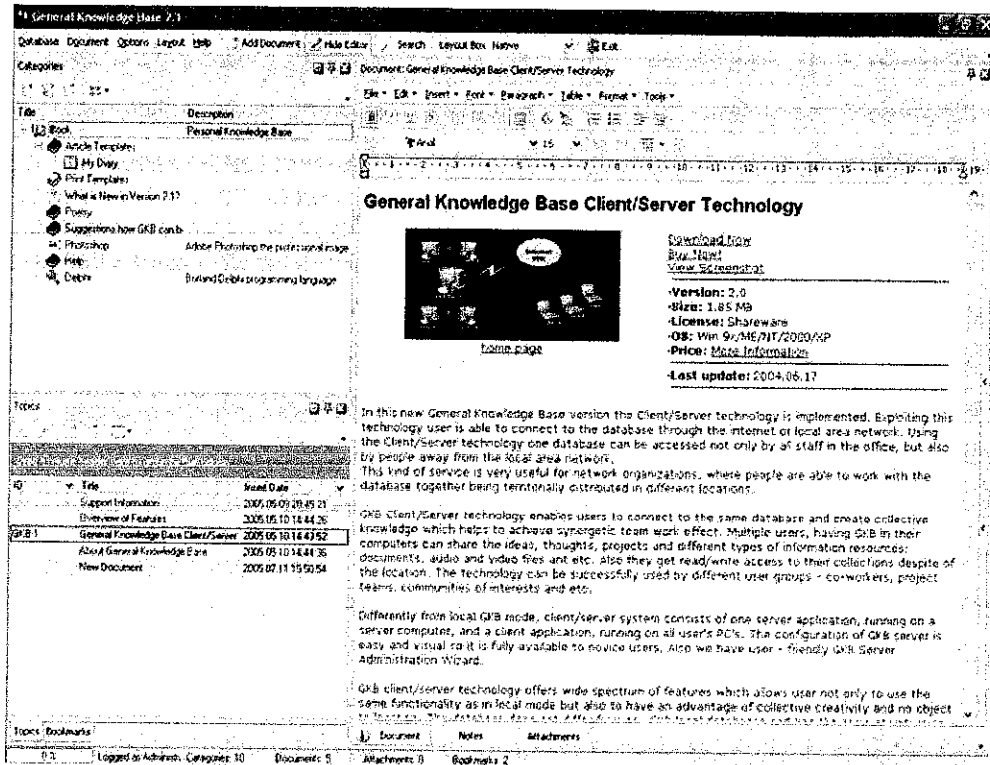
Figure 3: General Knowledge Screen Shot

General Knowledge features:

- This system can be accessed either on LAN, VPN, WAN or over Internet.
- The system has its own integrated Database Manager.
- It has a powerful search engine to allow the search according to any document criteria.
- It supports tables, hyperlinks, Styles Inspector to work with styles, Merge Tags Inspector for creating Print Preview templates, multi lingual including right-to-left languages and multi lingual live spell checker.
- It also has the capability to export documents in its own format to other formats such as TXT, RTF, DOC, HTML, XML and PDF.

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2.7.4 Mipsis CRM and Document Management

This software helps in collecting all knowledge data of an organization to build strategic advantages through increased customer loyalty and profitability. CRM (Customer Relationship Management) software uses its strong document management system. Besides that, it has several functions of product lifecycle and project management.
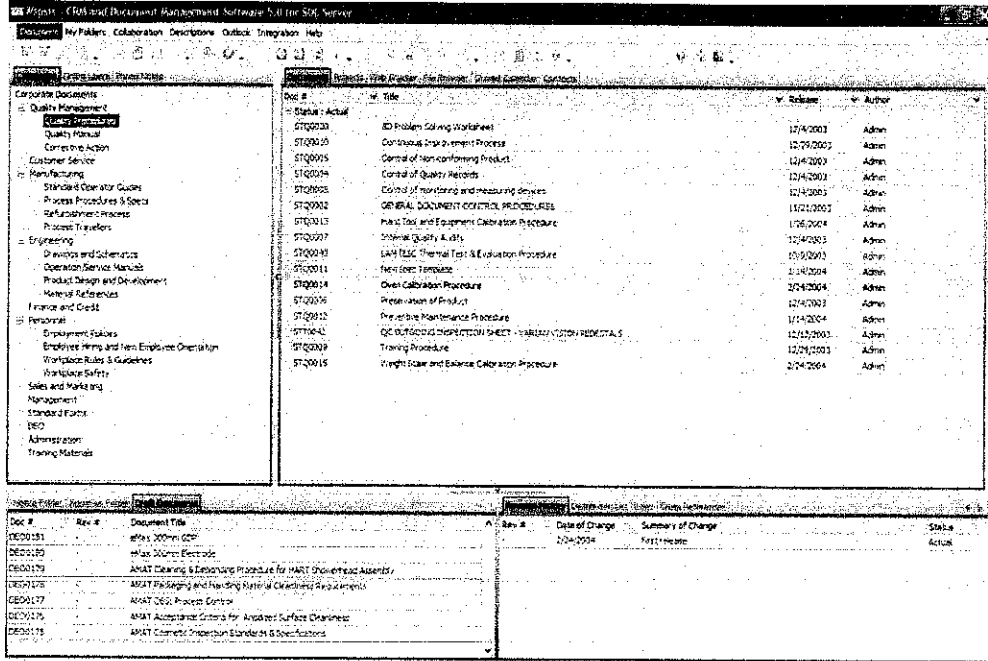

Figure 4: Mipsis CRM and Document Management Screen Shot

Mipsis CRM and Document Management features:

- Contact Manager.
- Issue Tracking.
- Product (life cycle) Manager.
- Human Resources Manager.
- Project Manager.
- Purchasing and Sales Manager.
- Shared Team Calendar.
- Outlook Integration.
- Workflow Diagram Designer.

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CHAPTER 3

METHODOLOGY

3.1   RATIONAL UNIFIED PROCESS (RUP)

In this project, the author will be using a methodology called Rational Unified Process (RUP). RUP is one of the two well-known iterative development frameworks. It is an implementation of spiral model. This methodology is developed to solve the weaknesses in the Waterfall Model. It provides a disciplined approach to assigning tasks and responsibilities within a development organization. The goal is to ensure the production of high-quality software that meets the needs of end user within a predictable schedule and budget. Unified Modeling Language (UML) is the foundation for successful visual modeling in RUP. Its lifecycle organizes the tasks into some major phases which are Inception, Elaboration, Construction and Transition (A Rational Software Corporation White Paper, 1998).
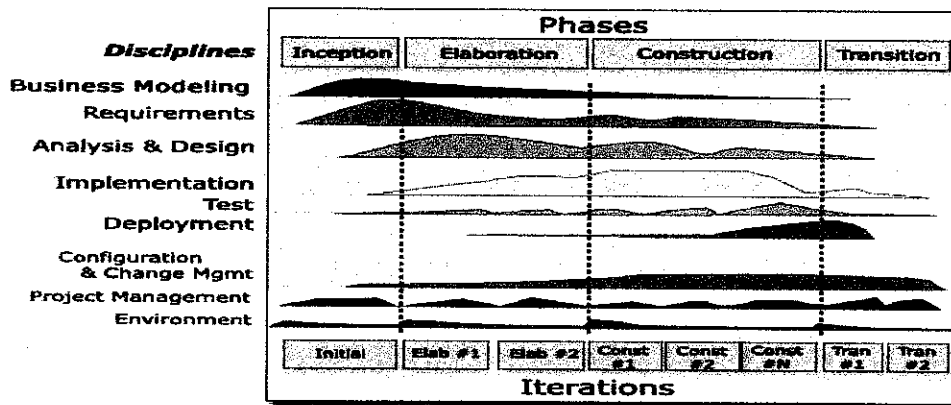
Figure 5 – Rational Unified Process (RUP)

The author decided to use RUP in his development process because:

1. It can be used to develop software iteratively.

2. The developer can easily manage his project requirements.

3. It has a milestone in each phase to assist the developer to verify the quality of the product.

4. This methodology helps the developer to control, track and monitor any changes on the software during the lifecycle.

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The process can be described in two dimensions or axes:

1. **Horizontal axis** represents the time and the dynamic aspect of the process as it is passed through. It is expressed in terms of cycles, phases, iterations and milestones.

2. **Vertical axis** represents the static aspect of the process. It is described in terms of activities, artifacts, workers and workflows.

3.2   PHASES IN RUP

Inception

In this phase, the scope of the project is prepared. If the project does not pass the Lifecycle Objective Milestone, it can be either cancelled or redesigned.

Possible deliverables from this phase:

- A scope or vision document which is the core project's requirements, key features, constraints and goals.
- An exploration of end user's requirements by using several requirement gathering techniques such as observation and questionnaire.
- Initial risk assessment by performing a feasibility study on time, expertise and cost.

The evaluation criteria of Lifecycle Objective Milestone:

- Stakeholder agreement on scope definition, cost estimation and schedule estimation.
- Credibility of the cost schedule estimates, priorities, risks and development process.

Elaboration

The problem domain analysis is done here. The architecture of the project starts to grow and gets its basic form. The project needs more assessment at this stage. There are two main Unified Model Language (UML) models required in Elaboration phase which are Use Case Model and Class Model. The prototype is started to be developed. This phase must pass the Lifecycle Architecture Milestone. If the project fails, it can be cancelled or redesigned.

Outcomes from Elaboration phase:

- Use-case model and Class model.
- A Software Architecture Description.
- A development plan for the overall project.

The evaluation criteria of Lifecycle Architecture Milestone:

- Is the architecture stable?
- Does the major risk elements have been addressed and resolved?
- Is the plan for the construction phase sufficiently detailed and accurate?

Construction

In this phase, the main focus is to build all components and other features of the product being designed earlier. The developer begins to do the coding. Several construction iterations may be developed in order to create a very good demonstrable prototype. The Construction phase produces the first external release of the software. This phase also has a milestone called Initial Operational Capability Milestone.

Some possible deliverables from this phase:

- The product is integrated on the adequate platforms.
- The user manual.
- A prototype of the product is released.

The evaluation criteria of Initial Operational Capability Milestone:

- Product is stable and mature enough to be deployed to end users?
- Are all stakeholders ready for the transition to end users?

<u>Transition</u>

In the Transition phase, the product is introduced to the end users. The quality of the product is checked to ensure it follows the quality level set in the Inception phase. The transition phase is entered when a baseline is mature enough to be deployed in the end user domain. If it does not meet the level or the standards of the end users' requirements, the entire cycle in this phase will be done again. After reached the Product Release Milestone the product is ready to use and ends its development process.

Main activities:

- "Beta Testing" to validate the product against user expectations.
- Fix any bugs and do some enhancements on the product.
- Conversion of operational databases.
- Train users and maintainers.

The evaluation criteria of Product Release Milestone:

- Is the end user satisfied with the final product?
- Are the actual resources expenditures still acceptable after the product is finished?

3.3 DISCIPLINES IN RUP

Business Modeling

Document business processes called business use cases. This assures a common understanding among all stakeholders of what business process needs to be supported in the organization.

Requirement

Describe what the system should do which allows the developer and the end user to agree on the requirement.

Analysis and Design

Its goal is to show how the system will be realized in the implementation phase.

Implementation

The purposes of implementation are:

- To implement classes and objects in terms of components
- To test the developed components as units.

Test

The purposes of testing are:

- To verify the interaction between objects.
- To verify the proper integration of all components of the software.
- To verify that all requirements have been correctly implemented.
- To identify and ensure defects are addressed.

Deployment

The purpose of the deployment workflow is to successfully produce product releases and deliver it to the end user.

- Producing external releases of the software.
- Installing the software.
- Providing help and assistance to end user.
- Conducting several beta tests.
- Migration of existing software or data.

Project Management

This workflow focuses mainly on the specific aspect of an iterative development process. Project management provides:

- A framework for managing the project.
- Practical guidelines for planning, staffing, executing and monitoring the project.
- A framework for managing risk.

Configuration and Change Management

It describes how to control a big number of objects produced by several people who are working on a common project. Control Management helps to avoid costly confusion and ensures that resultant objects are not in conflict.

Environment

The purpose of the environment workflow is to provide the software development organization and the software development environment.

CHAPTER 4

RESULT AND DISCUSSION

4.1 ARCHITECTURAL MODEL

IFK Manager is a web-based system that can be accessed via the Local Area Network (LAN) of the company. The system is implementing the Client-Server Architectural Model. The author decided to use this model because it is easy to manage and implement. Client-Server Architectural Model has multiple of clients and one server linked together as shown in Figure 6. There is a large database called IFK Manager Database connected to the server. This architecture allows more than one client to use the system simultaneously. Basically, the client will send an invocation message to the server when it wants to perform a specific task. The server will accept the message and processes it immediately. After that, the server will retrieve the requested data from the database and return the right result to the client.
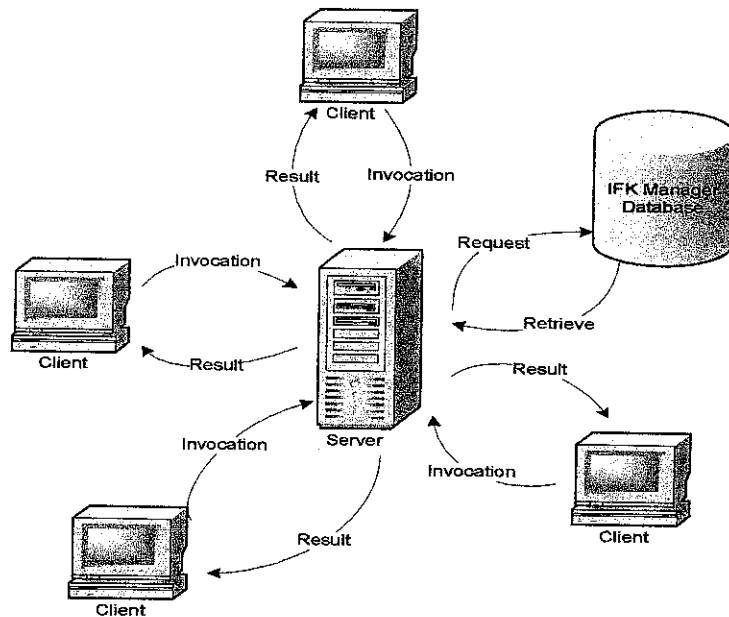

Figure 6 – Client-Server Architectural Model

4.2   SYSTEM FEATURES

Below are several features that will be included by the author in this system:

1. Search engine:

   Search engine is used to look for an image or a document file that is located inside the server.

2. Upload, Rename and Delete:

   Employee can use these operations to upload a file (image and document file), rename it and delete a specific file.

3. Organizer:

   It is used to group an image and a document file according to its appropriate category.

4. Login and Logout:

   This feature is to protect the system from a stranger. Employees who want to use IFK Manager must key in their username and the password correctly.

5. Forum:

   Forum is used as the medium for employees to discuss any job-related topics and share their working skills with each other.

6. Directory Overview:

   Directory Overview lists down all folders that are used to store the images and the document files inside the server.

7. Shout Out Box:

   It can be used by employees to have a chat and make a discussion with each other.

8. Notification:

   Employees will be notified with a message when a new file is added (image and document file) into the server.

9. Language:

   This system can be viewed in two languages; English and Bahasa Melayu.

10. On-line Poll:

   This feature allows employees to vote on various issues related to the knowledge or contents within the organization.

4.2.1 SHOUT OUT BOX

Shout Out Box is an alternative way for employees in the company to do a simple and a short group discussion among them. They can exchange ideas and views which are related to their jobs. Besides, employees can get a quick solution to their problems by having a discussion in this component. Employees can send more than one message at a time. But, they may not be able to post their message and get several error messages as shown below if the nickname is empty, the message is empty, the message contains restricted words or they used nickname "Admin" to post their message.

Figure 7 – Shout Out Box

Figure 8 – Shout Out Box
Error Message

4.2.2 ON-LINE POLL

On-Line Poll is used to do a survey or a study especially in verifying the technical skills and the lesson learned of the employees in the company. For example, one poll to know the number of employees who can make an installer by using software named Inno Setup can be made. This feature is very useful because the result of the poll can be obtained immediately and the company can analyze the result before taking any further actions based on the result. Employees can vote only once and they must choose the answer before submit their vote. If not, several error messages will be displayed. This on-line poll is created by the administrator as shown in Figure 11. The administrator can create more than one poll but only one poll can be activated. The result of the poll is displayed in a bar graph.

Figure 10 – On-line Poll Error Messages

Figure 9 – On-Line Poll
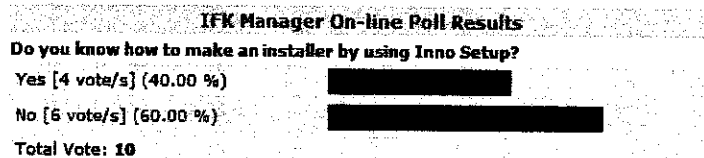
Figure 11 – On-Line Poll Result

Figure 12 – Create On-Line Poll

Figure 13 – Activate On-Line Poll

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4.2.3 NEWS

News is a method to make any important announcement so that all employees who are using this system will be informed and aware about a particular event. It also can be used to share the technical skills, information, best practices and lesson learned. For example, a notice to configure an IP address can be published by using this feature. Only the System Administrator can post and delete the announcement or notice as shown in Figure 15. Therefore, the employee must see the administrator before the news can be posted.

IFK Manager News
24-4-2008 10:48 AM   Please use Caller to insert, edit or delete questions for Smart Tutor. Ensure IP address of the server is correct:165.0.1.1
24-4-2008 10:39 AM   One seminar about Smart Tutor development skills will be held on 25/05/2008. Time is going to be announced later.
24-4-2008 10:35 AM   A training on how to create an installer using Inno Setup will be conducted today at 4 pm. Thank you.

Figure 14 – News Preview

Posted News	Date/Time	Action
Please use Caller to insert, edit or delete questions for Smart Tutor. Ensure IP address of the server is correct:165.0.1.1	24-4-2008, 10:48 AM	Delete
One seminar about Smart Tutor development skills will be held on 25/05/2008. Time is going to be announced later.	24-4-2008, 10:39 AM	Delete
A training on how to create an installer using Inno Setup will be conducted today at 4 pm. Thank you.	24-4-2008, 10:35 AM	Delete

Figure 15 – Administrator News Panel

4.2.4 IMAGE & FILE SUBSYSTEM

In this subsystem, employees can store and organize images or document files systematically in one location inside the server. Image & File Subsystem helps employees to find a specific image or document file easier in a short time. They can reduce their searching time too by using this subsystem. Images and document files are categorized by several folders which are located in one main folder whether "Files Bank" for document files and "Images Bank" for images as shown in Figure 16. Before upload, employees must select the image or the document file, choose the location to store the image or the document file and enter the security code. The purpose of this security code is to ensure on the authorize person can upload.
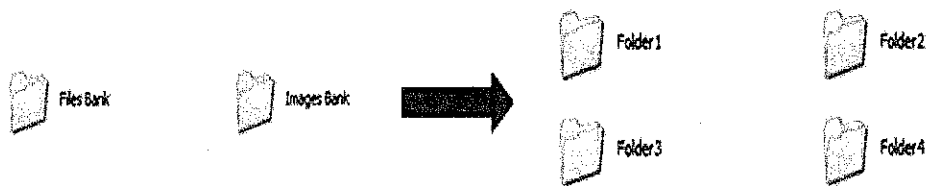
Figure 16 – Folders Structure

Figure 17 – Image Upload Form

Figure 18 – Create New Directory
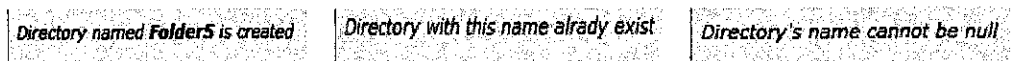
Figure 19 – Create New Directory Error Messages

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Create New Directory		
	[Upload Image	View Image	New Directory	Delete Directory]	
Select Directory: Folder1 [v]		
	Delete Directory	

Figure 20 – Delete Directory

Directory named **Folder5** is successfully deleted

Figure 21 – Delete Directory Error Message

The administrator can create a new directory which will be used by employees to categorize the image or the document file. However, only the administrator can delete the folder that is no more needed in this subsystem.

View Uploaded Image		
	[Upload Image	View Image	New Directory| Delete Directory]	
Select Directory: Folder1 [v]		
	View Image	

Figure 22 – View Uploaded Image

Image Name	Delete?	Action	Additional Information
1024_5.jpg	[ ]	Download - Rename	Image size: **158.77 KB** Uploaded on: **2008-01-22, 03:56:34** Resolution: **1024 x 768**

Figure 23 – View Image

File Name	Delete?	Action	Additional Information
Lec._11__Rec__Fea.ppt	[ ]	Download - Rename	File size: **589.00 KB** Uploaded on: **2005-05-05, 07:20:32**

Figure 24 – View Document File

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Images will be displayed as thumbnails while document files are listed without any thumbnails. Employees can click on the image in order to view it in a larger size. Before employees can view the image or the document file, they have to select the folder first as shown below. Employees also can sort them by name or date of upload. They also can download the image or the document file into their computers. Security code is needed to delete the image or the file from this system. Employees can delete more than one image or document file at a time.

Figure 25 – Delete Image or Document File

4.2.5 FORUM

In IFK Manager, forum is created in order to provide employees in the company with a tool for them to make a group discussion, exchange ideas or opinions and share their technical skills, best practices and lesson learned. Forum used in this system is open-source. It is very easy to use since it has similar functions just like other forums and employees can utilize this forum to capture and share any knowledge which is related to their daily tasks. IFK Manager Forum is also having a search engine so that employees can search for a particular topic easily. To use it, employees must enter their keyword and the topics will be listed as shown below.

	Forum	Topics	Posts	Last Post
First Category				
🗐	First Forum	2	3	Mon Apr 21, 2008 17:24:25 Last post by: Tem
🗐	First Forum2	1	2	Mon Apr 21, 2008 18:03:22 Last post by: Tem

Figure 26 – Forums

	Topics	Topic Starter	Replies	Views	Last Post
🗋	How to create a setup file using Inno Setup	Tem	0	1	Thu Apr 24, 2008 05:27:45 Last Post by: Tem

Figure 27 – Topics

🗐 General Access Forum

🗋 New Posts Since Last Visit

Figure 28 – Notification

Search Topic in Forum

Enter topic's name or click View to see all topics

Topic's Name: [   ]

[View]

⬇

Topic Found
How to create a setup file using Inno Setup	Last Post by: **Tem** at Thu Apr 24, 2008 05:27:45
First Page

Figure 29 – Search Engine

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4.3 FEASIBILITY STUDY

4.3.1 Technical Feasibility

Image, File & Knowledge (IFK) Manager's is feasible technically, although there are some risks to be considered in this project.

Image, File & Knowledge (IFK) Manager's risk regarding familiarity with application is low:

- IFK Manager can be used easily even though the employee's skill is low because the interface is simple and user-friendly.
- It is very easy to navigate through this system since IFK Manager is using icons that are well-understood.

Image, File & Knowledge (IFK) Manager's risk regarding familiarity with technology is low:

- The employee can employ this system without difficulty because they already know the basic operation of a computer.
- There should be no problem for the employee to get familiar with several technologies in this system because all of them are common and easy to use.

The project size is considered medium risk:

- IFK Manager will take about two semesters to complete.
- The system is going to be developed by one person only.

The compatibility with Image, File & Knowledge (IFK) Manager's should be good:

- The system is compatible with the current operating system used by the company.
- The system can be operated in several common browsers such as Internet Explorer and Mozilla Firefox.

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4.3.2 Economic Feasibility

Tools used in developing Image, File & Knowledge (IFK) Manager mostly are open-source software. Therefore, the system can be developed at a minimum cost since all these tools are freeware. The following are tools used by the author to build this system.

- Adobe Macromedia CS3:

  The software is used to design and develop a website. It allows the author to create the user-interface, forms and tables. Adobe Macromedia CS3 also supports PHP language, XHTML and Java Script which are implemented in IFK Manager. By using this software, the author can write dynamic pages easily and integrate a database with the system.

- Apache:

  Apache is installed by the author so that the computer can be operated as a web server for IFK Manager. It makes the system available and accessible to users via Intranet.

- phpMyAdmin:

  phpMyAdmin is a web-based application to manage MySQL databases. The author uses this software to set restrictions, create and handle databases used in IFK Manager.

4.3.3 Organizational Feasibility

From the organizational perspective, this project has a low risk. IFK Manager will not cause any failure to the business flow of the company. But, it will help employees to eliminate all their problems before this. This system also will benefit the company itself when the product such as educational software can be produced in a short period. It is because employees can do their works easily without any difficulties in locating the image anymore.

4.4   ACTIVITY DIAGRAM
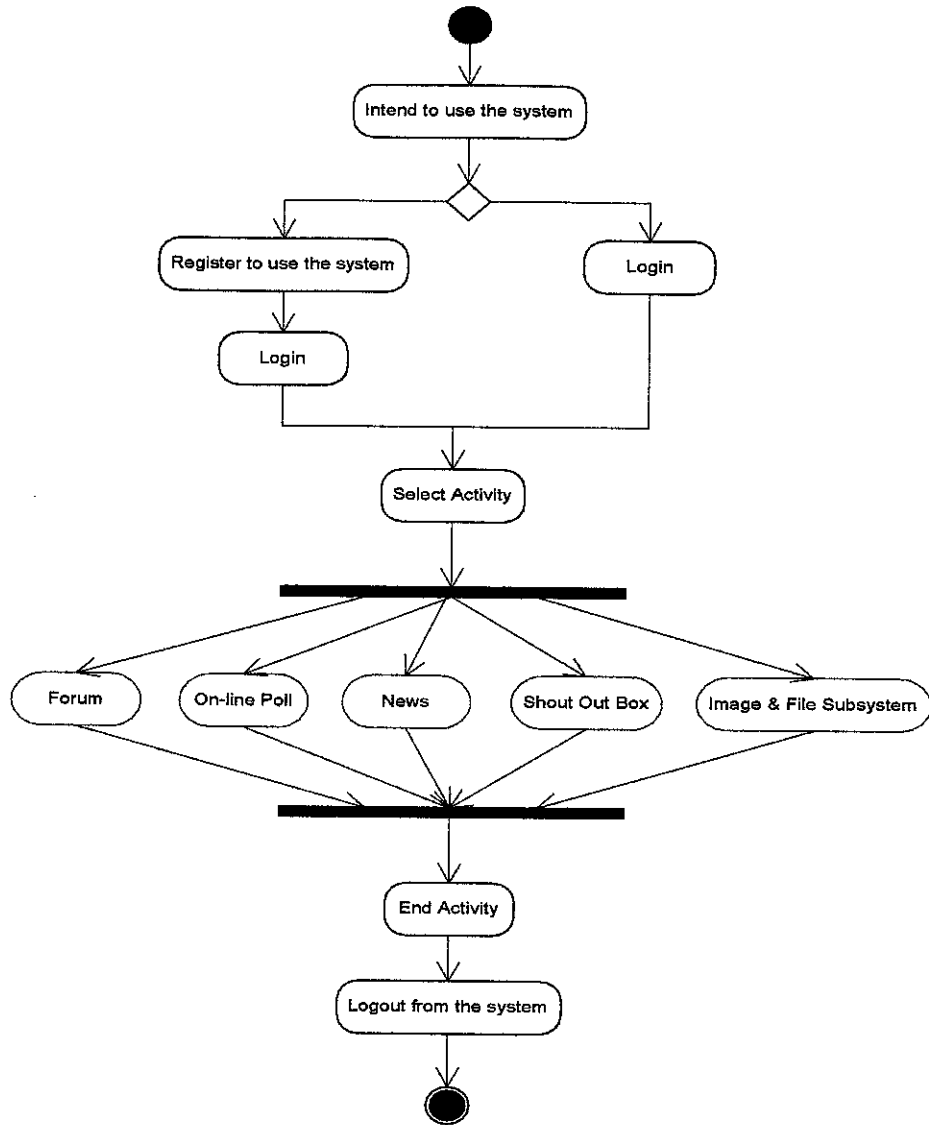
Figure 30 – IFK Manager Activity Diagram

Activity diagram above depicts how the system operates and what processes that are perform during its operation. To start using this system, employees must register themselves first with IFK Manager. After registered, they can login and select the activity they want to perform as shown in the diagram. When employees have finished up their activity, they can logout from the system.

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4.5   USE CASE DIAGRAM

IFK Manager

Register

Login

Change Language

Search File & Image

Image & File Subsystem

Forum

On-line Poll

News

Shout Out Box

Logout

Employee

System Administrator
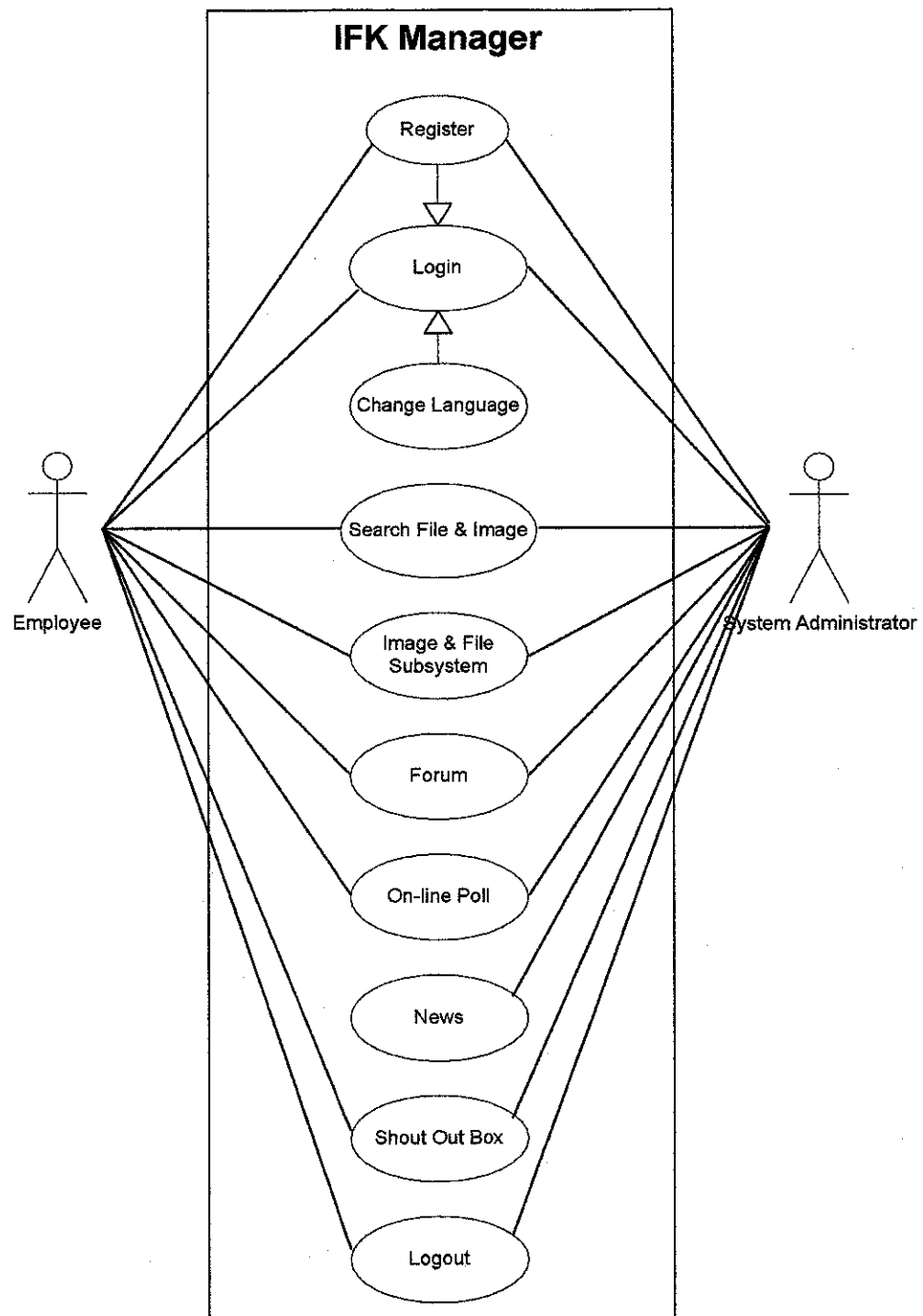
Figure 31 – IFK Manager Use Case Diagram

This use case diagram shows the interaction between the employee, the system administrator and the system itself as a whole. It also illustrates all functions that can be performed by both users in this system.

Image & File Subsystem

- Login
- Upload File
- Notification
- View File
- Sort File by Name or Date
- Delete File
- Rename File
- Search File

Employee

System Administrator
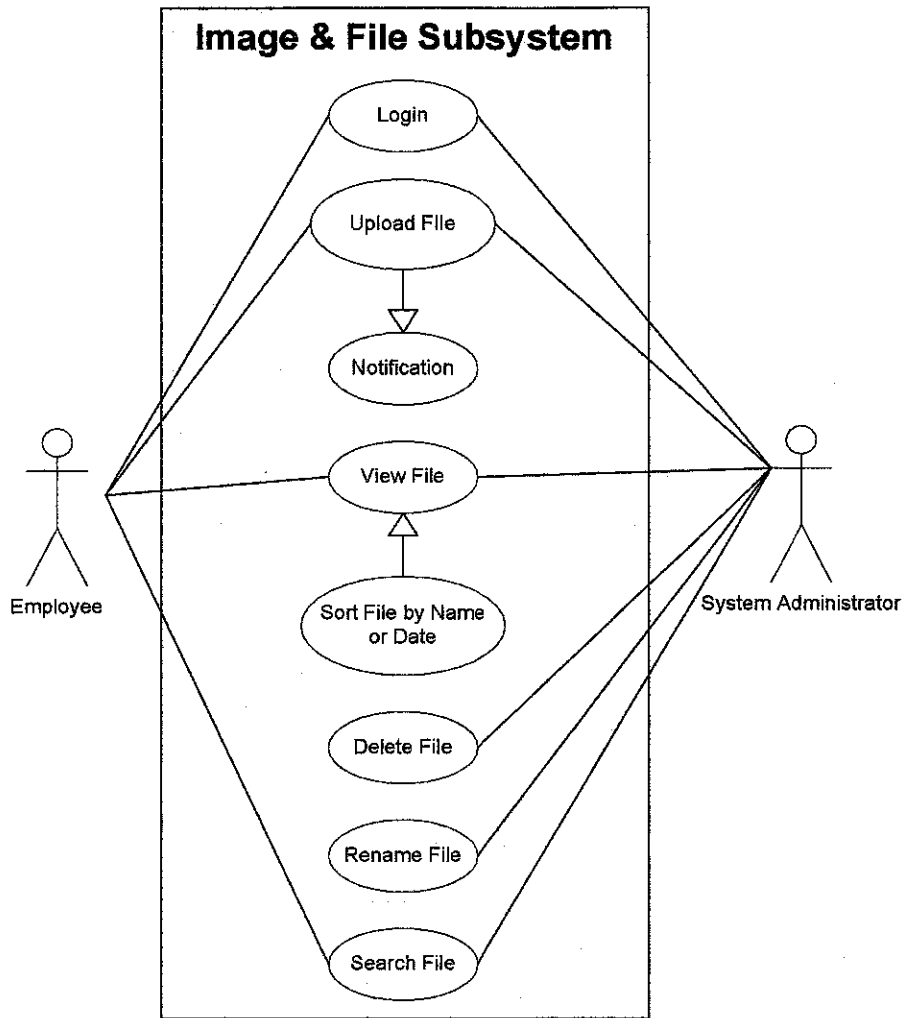
Figure 32 – Image & File Subsystem Use Case Diagram

In Image & File Subsystem, both users can upload the file such as image and document file. This subsystem will subsequently notify other users in IFK Manager about the file. Files can be sorted by name or date when both users are viewing them. Images will be viewed in thumbnail while document files are listed down in a list. They also can use the search engine to search the selected file. Only the system administrator can give the employee the authority to delete and rename the file.

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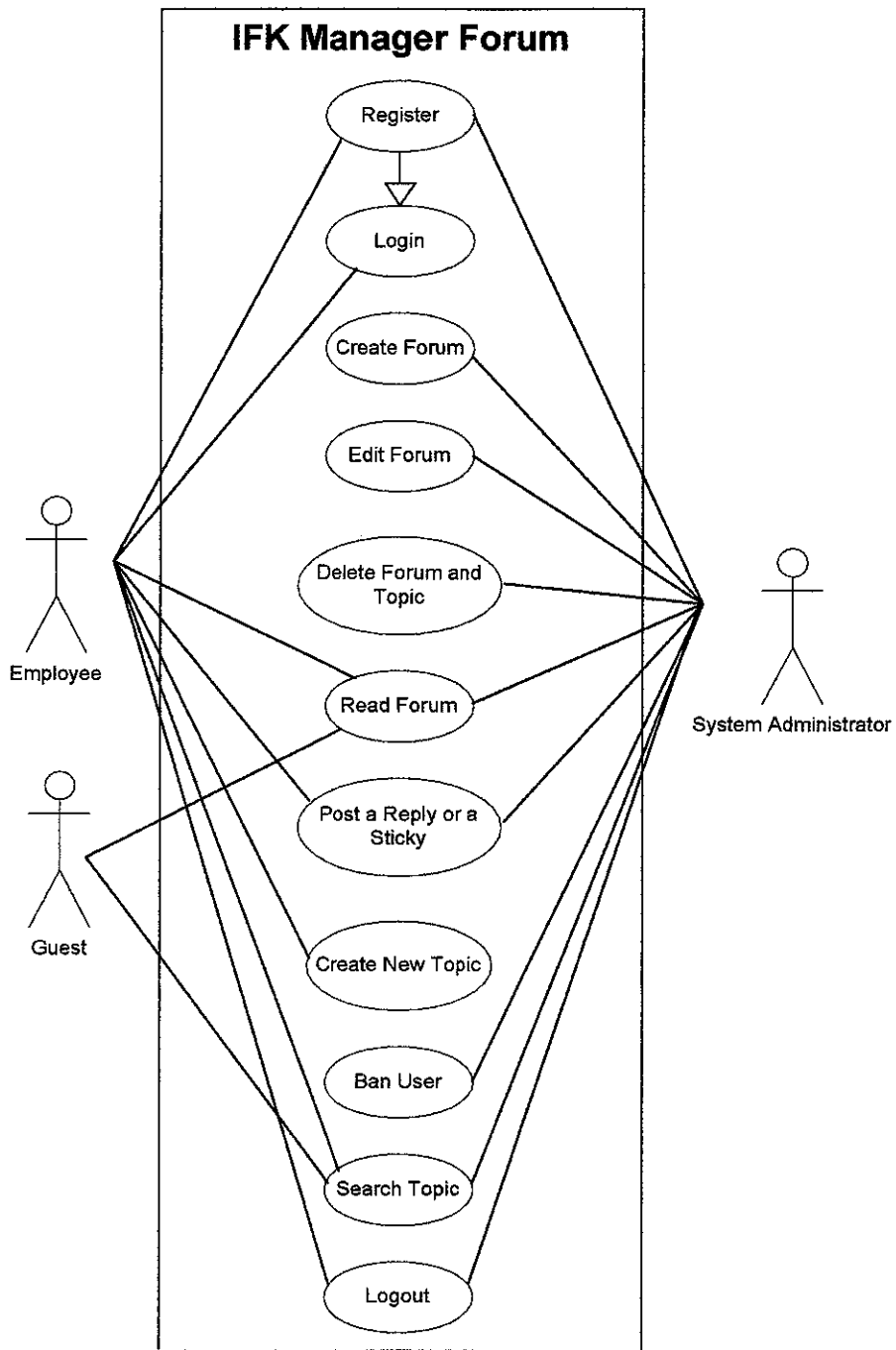
Figure 33 – IFK Manager Forum Use Case Diagram

The system administrator will create several forums for employee to join. Employees must login first into the forum before they can post a reply or a sticky and create any new topics. If they do not login, employees can use the forum as guests where they can only read the forum and search for the topic. The administrator has the power to ban the employees from using the forum permanently, delete the forum and edit it.
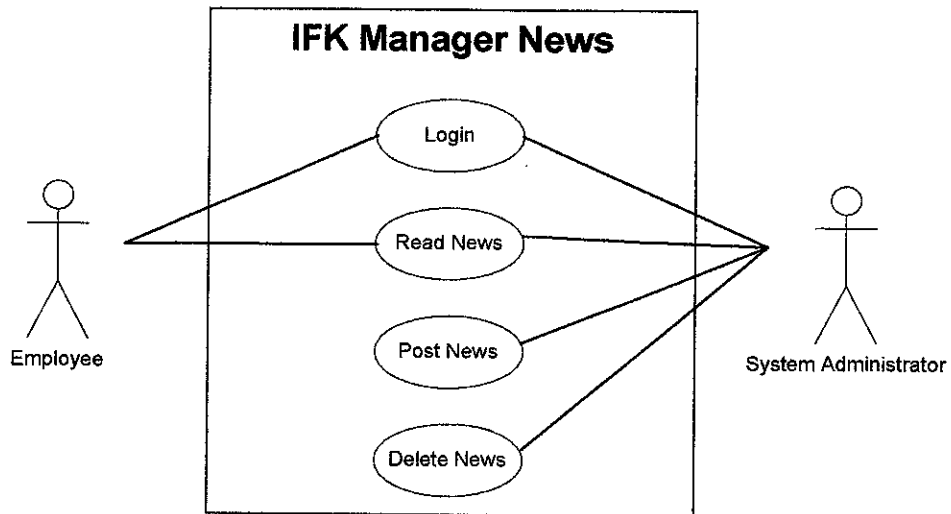
Figure 34 – IFK Manager News Use Case Diagram

The employee and the system administrator can read the news after logged in to this system. But, only the administrator has the authority to post and delete the news.
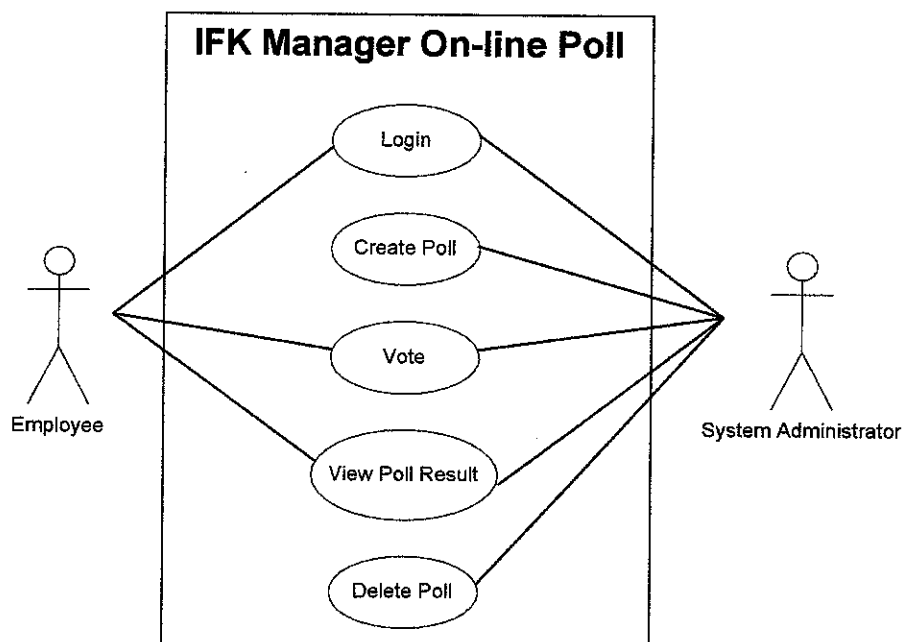
Figure 35 – IFK Manager On-line Poll Use Case Diagram

The system administrator will create an on-line poll for the employee to participate. Both users can vote only once and they can view the result immediately after voted. The poll can be only deleted by the administrator who has the power to do so.
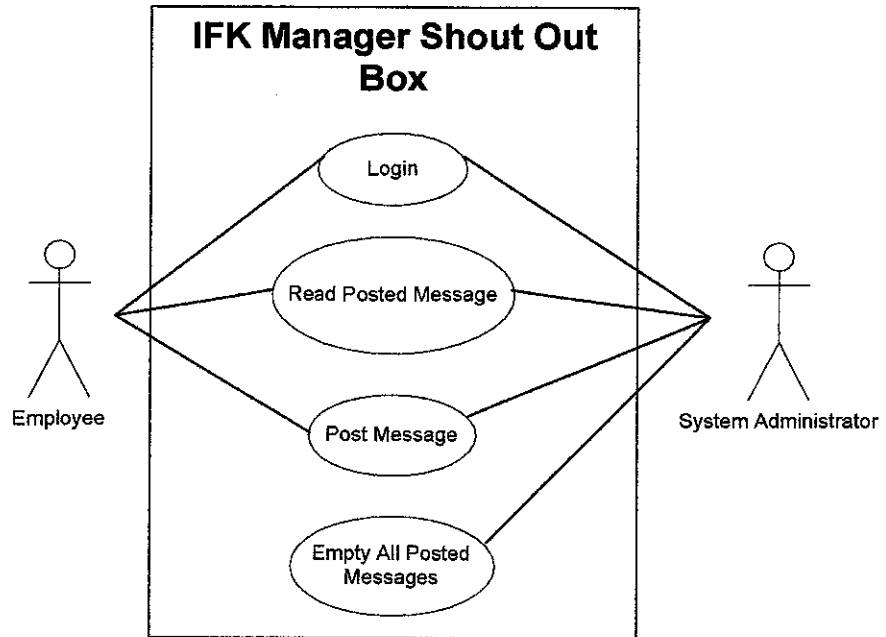
Figure 36 – IFK Manager Shout Out Box Use Case Diagram

The employee and the system administrator can read the posted message in the shout out box after logged in to IFK Manager. They also can reply by posting their own message. But, they must make sure that the nickname and the message is not empty. The administrator is the only person who can empty the Shout Out Box by deleting all posted messages in it.

4.6   CLASS DIAGRAM
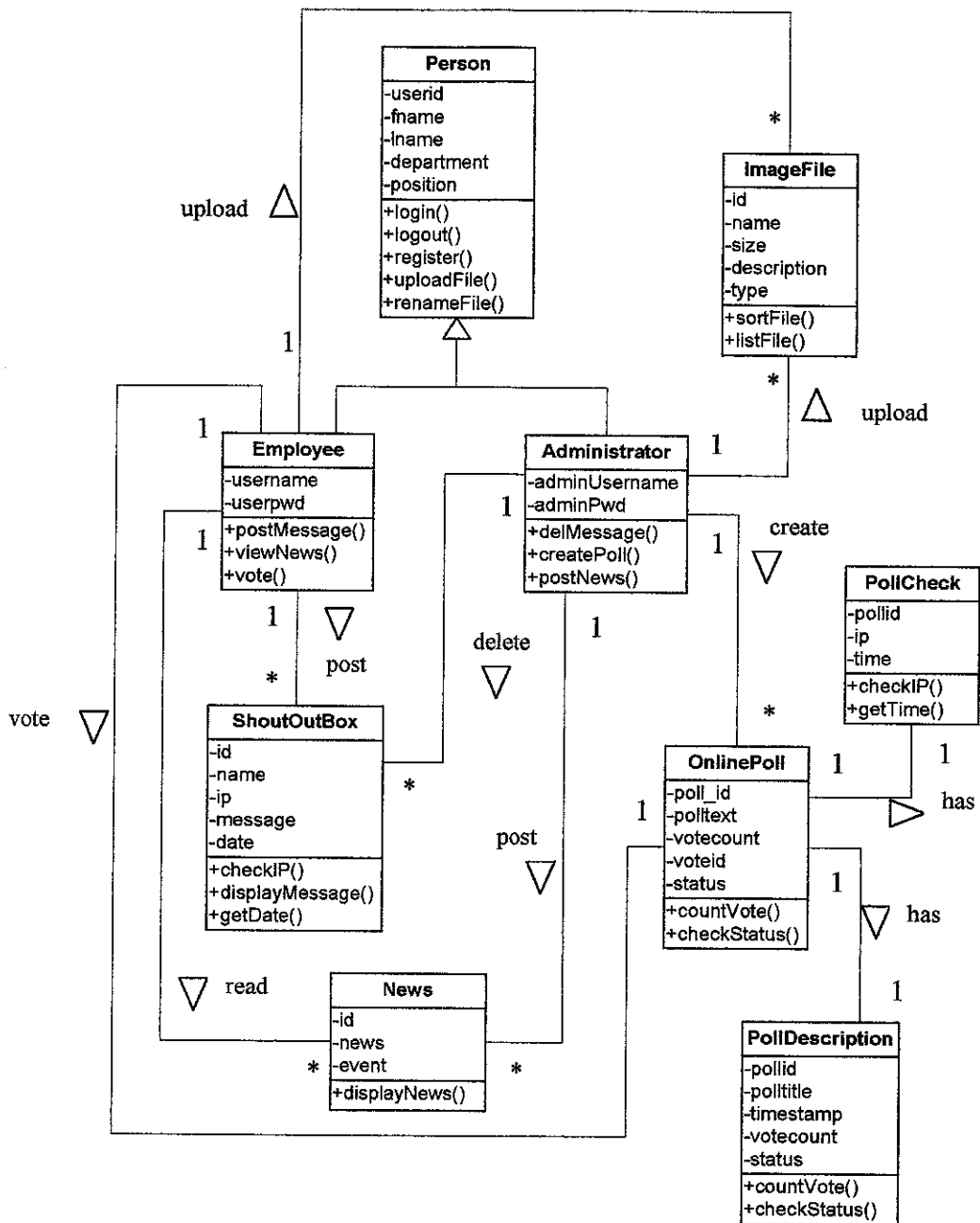
Figure 37 – IFK Manager Class Diagram

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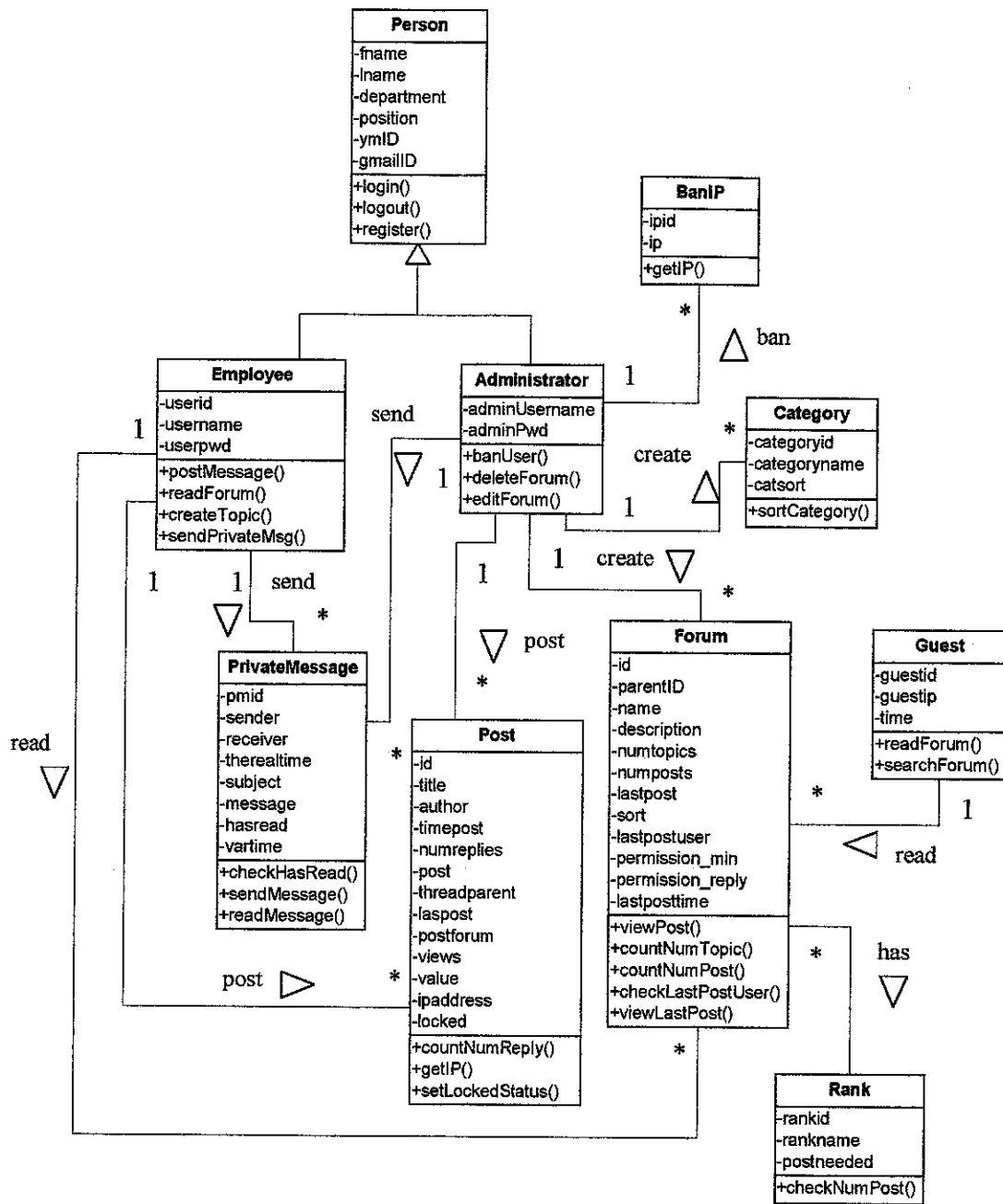
Figure 38 – IFK Manager Forum Class Diagram

4.7   KNOWLEDGE FLOW DIAGRAM
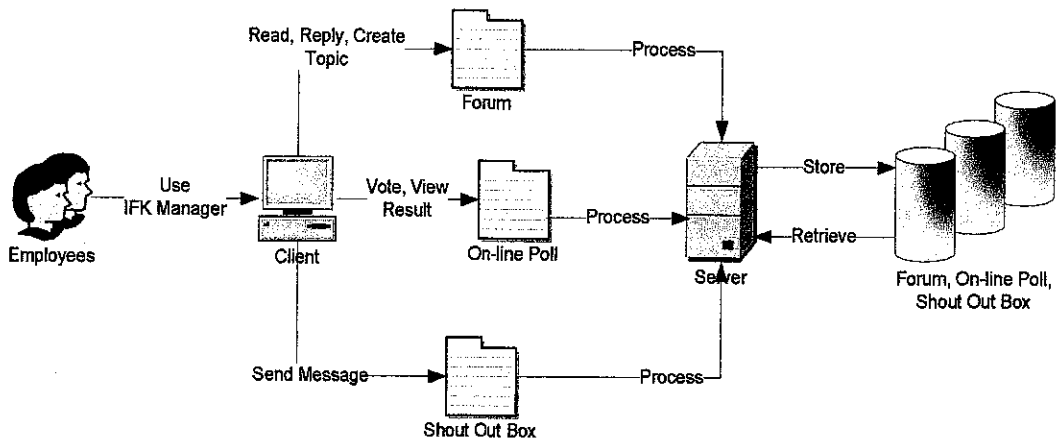
Figure 39 – IFK Manager Knowledge Flow Diagram

The diagram above shows that the knowledge is coming from employees who intend to use IFK Manager. Employees can access the system by using the Internet browser in their computers. They can select one out of three components; Forum, On-line Poll or Shout Out Box. Employees can read the posted message, reply to other message and create a new topic by using the Forum. When they replied, the message will be captured and stored into the database. Then, the message can be retrieved by other employees who want to read or reply to the message. In the On-line Poll, employees can vote and view the result of several polls that have been created. All answers from the employees are captured and the database is used to store them. Employees can retrieve the data from the server in order to view the result in a bar graph. For the Shout-Out Box, employees can post a message which will be captured on the spot and put into the specified database. The message is displayed via the employees' Internet browser after it is recovered from the database.

The browser is used as the communication channel for the knowledge to flow in IFK Manager. Generally, the knowledge is posted to the server which will process it and store the knowledge into its appropriate database. If the employees want to retrieve the data of the selected component, the process will be reversed. The knowledge will be retrieved from the database via the server. After that, the knowledge is sent to the employees who can view the result by using the Internet browser.

4.8   DATA GATHERING TECHNIQUE

4.8.1   Observation

Observation is the first technique that is used by the author to gather the data for this project. During his 8 months industrial training period, he took this opportunity to observe and evaluate the current working procedure within the company especially under R&D Department. The company is a multimedia company and it has produced a lot of educational software. The author had been involved in several projects while undergo his training there. He noted some weaknesses in the recent operational procedure and came out with the following results:

- The author noticed that the employee took a long time to search for a particular image within the server. He experienced this problem by himself when he involved in some of the projects.

- The project was delayed because some images or files were lost and misplaced. The employee could not track them faster. Sometimes the company asked the graphic artist to redraw the picture which can increase the software development cost.

- Besides that, several new trainees could not accomplish the task given effectively due to a lack of continuous supports from the senior employee.

- In this company, employees did not have any tools to capture and share their working skills, problem solving techniques, opinions and information. Normally, new trainees learned these skills verbally from the senior employee but they are likely to forget them a couple weeks later.

4.8.2 Questionnaire

The second method used by the author to collect the data is questionnaire. It had been distributed to 15 employees in the company mostly in R&D Department. The number of participant involved in this technique is small since the company does not employ many employees. The questionnaire was given to each participant. Its main purpose is to get some feedbacks from employees whether they really needed this system or not. The example of the questionnaire can be viewed in the Appendices.
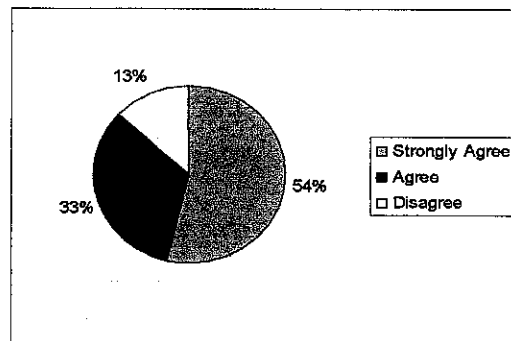
Figure 40 – Pie Chart 1

Figure 40 shows the result for the following question, "Is it very difficult to search for images and document files by using the current system applied?" in the questionnaire. 87% of overall employees are strongly agreed and agreed with this question while 13% are disagreed. The author concludes that this company requires a system that is used to organize and centralize all images and document files within the server. As a result, employees can find them easier and faster without wasting the time.
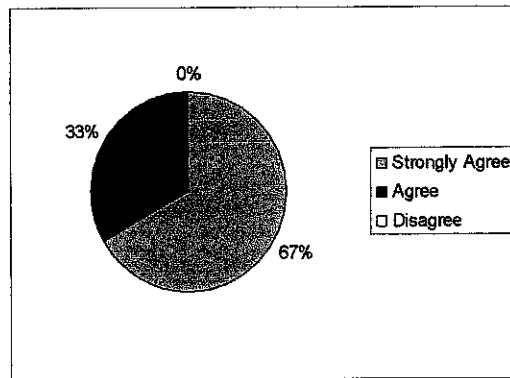
Figure 41 – Pie Chart 2

Result in Figure 41 is based on the question "Is it very hard to do the job without a support from other employee's working experiences?" from the questionnaire. 67% of overall employees are strongly agreed and another 33% employees are agreed. There are no disagree employees. It means that the company needs a system integrated by knowledge management tool such as forum so that employees' working skills and experiences can be captured and shared.

4.8.3   Interview

Interview is another technique used by the author to collect the necessary data for his project. The interview was conducted at the host company on 4th October 2007. Its main objective is to understand in detail how employees perform their daily tasks especially when working with images and document files. Besides that, this interview is aimed to survey whether there is a method for employees to share their ideas and do any group discussions or not. Five employees from Research and Development (R&D) Department and four from other departments had been selected as interviewees. It was a structured interview since the author wanted to get more specific and accurate information to develop IFK Manager. Most of the questions in this interview were closed-ended questions. There was no time limit for the interviewees to answer the questions.

Below are the questions that were asked during this interview:

- Please specify the problems that you have to encounter when performing your daily tasks?
- How long it takes to search for a particular image or a file document which is located inside the server?
- Why is it too difficult to look for the image or the file?
- What kind of method do you use to share your ideas, information and working skills with other employees?
- Do you think that the company should provide a forum for employees to do a discussion, share information and exchange ideas?

The interviewer discovered that employees in R&D Department took a lengthy time to search for a specific image or a document file inside the server. Employees admitted that the searching process was not easy because the files (image and document file) were kept in different folders and subfolders. They must open up those folders one by one and look for the image or the document file manually. Besides that, employees in this company wanted a system which could allow them to discuss any job-related topics, share their working skills and exchange ideas with each other. The interviewer was informed that employees must meet the most experience worker personally when they encountered some unsettled problems in their tasks. However, the person might be busy to go with the discussion. As a result, they had to solve their problems by themselves or stopped awhile their tasks until they found a good solution. At the end of each interview, most of the interviewees were happy with this project and hoped that it will bring a lot of benefits to the company as well as the employees later.

4.8.4 Post Interview

IFK Manager was handed to the target company although it is not fully complete so that employees in that particular company will get familiar and feel comfortable to use the system. After a period of time, a post interview has been done to get some feedbacks from the employees about this system. The post interview was conducted on 15th April 2008 which involved several employees in Research and Development (R&D) Department since they use this system frequently compare to other employees in the company.

Below are the questions that were asked during this interview:

- How do you feel when using this system?
- Do you think it is easy to use all features in this system?
- Can you specify any problems that you have been encountered when using this system?
- Does this system solve your problems before?
- Do you think that the forum in IFK Manager is very helpful and beneficial?

Majority of the interviewees are strongly agreed that IFK Manager is easy to use and they do not have any difficulties to understand its user-friendly interfaces. They also feel comfortable to all features of this system although some of them are not complete yet. But, they said that IFK Manager will be more useful and beneficial if those features are ready to be used later. Employees managed to reduce their time in searching the images or the document files by using the Image & File Subsystem in IFK Manager. They can easily locate them when they are stored in one location and organize systematically. Besides, they found out that the forum is very helpful. Through this forum, they can capture and share their working skills, best practices, lesson learned and technical skills. They also admitted that their daily tasks become easy and simple when they make use of this forum actively.

4.9   TESTING

The author has performed several tests on IFK Manager to ensure the system can operate correctly without errors. The objective of this testing is to discover faults or defects in the system where the behavior of the system is incorrect, undesirable or does not conform to its specification. Besides that, the testing is to check whether the system meets all requirements of this project.

4.9.1   Conduct the Testing

The test was conducted by inviting several employees who work in R&D Department at the company to assess the system. There is no time limit for this testing so that they can slowly test the system and find as many errors as possible. The employees can test the system in any manner until the system crashes or displays an error. The author uses a technique called Release Testing where these employees only focus on the functionality of the system. They must assess the system components such as IFK Manager On-line Poll, Image & File Subsystem, IFK Manager Forum, IFK Manager Shout Out Box and IFK Manager News. This testing can be stopped whenever they cannot find a single error or more errors and satisfied in testing the system. At the end of the session, they are required to give some feedbacks about the system so that it can be improved again later. The testing is considered as successful if one or more errors are detected and it is fail if the employees cannot find any errors during this procedure.

4.9.2 Testing Method

The method used by the author is called Release Testing. It is the process of testing a release of the system that will be handed to the real user. The author uses this method because he wants to increase the real user's confidence that IFK Manager meets its requirements and ready to be implemented. Release Testing is usually a black box testing process because its tests are derived from the system specifications. IFK Manager is treated as a black-box without knowing how the internal system behaves. It aims to the test the functionality of the system according to the requirements. The tester only concerns with the functionality of the system and not how the system is implemented. This level of testing requires thorough test cases to be provided to the tester who can simply verify that for a given input, the output value is the same as the expected value specified in the test case (Laycock, 1993).

4.9.3 Test Case

Input Value	Expected Value	Output Value	Remarks
Nickname and *Message*. Then, clicks *Shout It!*	Message is posted and displayed	Message is posted and displayed	Message is posted
Nickname without *Message*. Then, clicks *Shout It!*	"*The message is empty*" will be shown	"*The message is empty*" is shown	Fail to post the message
Message without *Nickname*. Then, clicks *Shout It!*	"*Please enter your nickname*" will be shown	"*Please enter your nickname*" is shown	Fail to post the message
Nickname and *Message*. Then, clicks *Clear*	Nickname and Message will be cleared	Nickname and Message is cleared	

Table 1 – IFK Manager Shout Out Box Test Case

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Input Value	Expected Value	Output Value	Remarks
Select an answer and clicks *Vote*	Total vote will be increased by one	Total vote is increased by one	Success to vote
Answer is not select and clicks *Vote*	*"Please select your answer before vote"* will be shown	*"Please select your answer before vote"* is shown	Fail to vote
Click *View Results*	Results of the on-line poll will be displayed	Results of the on-line poll is displayed	
Select an answer and clicks *Vote* once again	*"You are allowed to vote only once a day."* will be shown	*"You are allowed to vote only once a day."* is shown	Fail to vote

Table 2 – IFK Manager On-line Poll Test Case

Input Value	Expected Value	Output Value	Remarks
Browse .JPG file and clicks *Upload*	The file will be stored inside the server	The file is stored inside the server	
Browse .GIF file and clicks *Upload*	The file will be stored inside the server	The file is stored inside the server	
Browse .PNG file and clicks *Upload*	The file will be stored inside the server	The file is stored inside the server	
Browse .PSD file and clicks Upload	The file will be stored inside the server	The file is stored inside the server	
Browse .DOC file and clicks *Upload*	The file will be stored inside the server	The file is stored inside the server	
Browse file with other extension and clicks *Upload*	"The file has invalid extension" will be displayed	"The file has invalid extension" is displayed	Other file extension are invalid

Table 3 – Image & File Subsystem Test Case

Test cases as shown above help the author to test the functionality of IFK Manager. The testing is focusing on the core components of this system.

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CHAPTER 5

CONCLUSION AND RECOMMENDATION

Image, File & Knowledge (IFK) Manager is a system that applies the Content Management System (CMS) and the Knowledge management System (KMS) concepts. The research on CMS and KMS helped the author to identify the suitable concepts, designs, features and technologies for his system. The author developed this system to solve several matters encountered by employees in doing their daily tasks. IFK Manager has proved that it can help a multimedia company to organize and centralize images that are used to build up the software systematically. This system truly assists the company to capture and share the knowledge such as the employee's working skills and experiences. IFK Manager comes up with several useful features so that employees can perform their task faster and easier. In the future, the author would like to enhance this system by adding in the video conference so that the knowledge sharing process will be more interactive. IFK Manager is going to operate as it should do. However, employees' attitudes where they still cannot leave behind their previous behaviors such as handed over the working skills verbally can make this system fails to achieve its main objective. Employees have to set their mindset and start to use the system appropriately and actively participate in the knowledge sharing process. As a conclusion, the author hopes that IFK Manager will benefit the multimedia company once the system is implemented.

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APPENDICES

1-1 GANTT CHART

ID	Task Name	Start	Finish	Duration	Sep 2007				Oct 2007				Nov 2007			
					9/9	9/16	9/23	9/30	10/7	10/14	10/21	10/28	11/4	11/11	11/18	11/25
1	Project Research	8/3/2007	8/24/2007	3.2w												
2	Project Planning	8/27/2007	9/7/2007	2w	▪											
3	Project Analysis	9/10/2007	9/14/2007	1w	■											
4	Define Requirement and Functionality	9/24/2007	9/28/2007	1w			■									
5	Information Gathering	10/1/2007	10/5/2007	1w				■								
6	Modeling Design	10/8/2007	10/19/2007	2w					■							
7	Interface Design	10/22/2007	10/26/2007	1w							■					
8	Oral Presentation	10/29/2007	11/2/2007	1w								■				

Figure 42 – Gantt Chart

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1-2 QUESTIONNAIRES

IMAGE, FILE & KNOWLEDGE (IFK) MANAGER QUESTIONNAIRE

The purpose of this questionnaire is to get some feedbacks from employees regarding to their recent working procedure in a multimedia company. Please take a few minutes to answer the following questions.

Rating scale: (1) - strongly agree   (2) - agree   (3) - disagree

1. It is very difficult to search for images and document files from the server by using the current system.

    (1)   (2)   (3)

2. A management system is needed in order to organize all images and document files in this company.

    (1)   (2)   (3)

3. The searching process for any image and file is very tedious and took a long time to get a result.

    (1)   (2)   (3)

4. At the beginning of your employment in this company, it is very hard to handle the previous project without any reference from the senior employee's technical supports, experiences and skills.

    (1)   (2)   (3)

5. Is the company needs a system where employee can contribute and share their ideas, views or skills related to a certain task.

    (1)   (2)   (3)

6. It is very difficult to learn a specific technique which is required to solve the task from other employee verbally. This technique must be captured in texts so that it can be referred again later.

Yes   No

Put your comment here (if any):

....

....

....

Thank you for answering this questionnaire. Your honest opinions will be very helpful so that a system called Image, File & Knowledge (IFK) Manager can be developed to improve the working procedure in this company.