

**Developing Knowledge Base Website with  
an Intelligent Search Engine**

by

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Dissertation submitted in partial fulfilment of  
the requirement for the  
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# **CERTIFICATION OF APPROVAL**

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A project dissertation submitted to the

Information Systems Programme

Universiti Teknologi PETRONAS

In partial fulfilment of the requirement for the

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**September 2021**

## **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 expect as specifies in the reference and acknowledgements and that the original work contained herein have not been undertaken or done by unspecified sources or persons.



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SITI ZUNAIRAH BINTI AZAHAR

## **ABSTRACT**

A knowledge management system is an essential part of an organisation that can bring value if implemented and executed correctly. The current practice of knowledge management among organisations are not fully utilised their worker's knowledge to a centralised platform. Knowledge sharing among workers are also inefficient, thus reducing their productivity and performance. The existing knowledge base is also not being organised and appropriately documented. This project serves the objectives of making knowledge sharing, searching, and storing easier in the organisation. The study on the knowledge base and intelligent search engine was also conducted to develop the website, intelligent search engine, and design its functionalities. This project also focuses on the internal usage of the knowledge base in the organisation. The methodology used in this project is the waterfall model as the project software development life cycle suitable for a small project where the requirement is well defined. This project aims to develop a knowledge base website with an intelligent search engine to make knowledge sharing, searching and storing more seamlessly among workers in an organisation.

## **ACKNOWLEDGEMENT**

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## **LIST OF ABBREVIATION**

**FYP:** Final Year Project

**UTP:** Universiti Teknologi PETRONAS

**PHP:** Hypertext Pre-processor

**HTML:** Hyper Text Markup Language

**CSS:** Cascading Style Sheets

**SQL:** Structured Query Language

**DBMS:** Database Management System

**RDBMS:** Relational Database Management Systems

**UML:** Unified Modelling Language

**AI:** Artificial Intelligence

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# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 Background of Study**

Knowledge comes from processing and interpreting data. It involves experiences, values, perspectives, and contextual knowledge and enables one to appraise current and new experiences and knowledge and absorb them. Knowledge emerges from the knowledge workers and is used by them. People employ knowledge in decision-making.

In this swiftly developing business field companies recognise that they possess a great degree of expertise and that this knowledge ought to be handled. The use and growth of knowledge are crucial for quickness, productivity and efficiency. It is also vital that companies to have the expert knowledge in the correct location, structured in a proper way and at a minimum cost. When looking at the strength and value of knowledge, organisation need to have a system which is known as a knowledge base system so that employees may access knowledge in any given moment, place and platform to accommodate all knowledge of the organisation.

Thus, knowledge management is essential for the organisation to make sure they have the best quality of knowledge that can be accessed by their employee which result in organisation performance and productivity. These projects help to make the expert knowledge to be shared, transferred, and stored more seamlessly. The organisation will benefit from many things if they implement knowledge base.

## **1.2 Problem Statement**

A knowledge base is intended to help employees find information fast and efficiently. Knowledge bases consist of an article, troubleshooting steps, diagrams, and procedures to assist its users. Knowledge management and sharing among employees in an organisation are inefficient, which has a negative impact on the overall productivity and performance of the company. Employees are unable to find a solution since the existing knowledge base is disorganised rather than organised. Worker's knowledge in organisation is not well managed and easily shared, which limit the company productivity and performance

## **1.3 Significance of the Project**

- **Improve productivity and efficiency of employees**

Internal knowledge bases which are routinely utilised and updated are an excellent means of keeping staff informed about developments. If a new employee asks how to accomplish something and asks other employees, they will probably receive a dozen different replies. As it happens, an individual has repeatedly distracted attention from any activities they undertake, which restrict their productivity and efficiency. However, by accessing the knowledge base rapidly, the user can get a concise and useful response by himself or herself, without having to disturb others from their duties. With a knowledge base, various departments can provide information which is beneficial or necessary for other departments. Some overlaps may occur, but the key to taking is that everyone have access to the information they need if they need it. This will increase the productivity of the organisation.

- **To provide a seamless experience for employees.**

Onboarding may be a time-consuming and demanding process. Firstly, we want to ensure that every new employee is aware of all processes and techniques to perform his work properly. However, it may take time to embark on and familiarise them with the contents. This platform for information can assist relieve this process. This procedure may also be automated with an internal knowledge base by

addressing common inquiries and by helping employees discover solutions to their questions.

- **Improved customer service for the organisation**

With a knowledge base, employees can address consumers swiftly and effectively. Access to troubleshooting in the knowledge base is considerably quicker than when customer services officers initially have had to approach their senior employees to fix client issues. The new boarding employees or an intern typically done this. This will significantly improve the firm customer service with a knowledge base up to date with essential information.

## **1.4 Objectives**

### **1.4.1 Project Objectives**

Following are the objectives of the project titled "Developing Knowledge Base Website with Intelligent Search Engine":

- To conduct study on knowledge base and intelligent search engine system.
- To develop knowledge base website with intelligent search engine.

### **1.4.2 System's Objectives**

The objectives for this knowledge base website system:

- To make knowledge sharing, searching and storing easier in organisation.
- To setup platform and design its functionalities.
- To develop intelligent search engine for knowledge searching.

### **1.5 Scope of Study**

The scope for this project is focus on creating a platform of knowledge sharing, transfer and storing that specifically for internal use in organisation. This project consists of three sections which is web design, setup and development, database indexing and management and intelligent search engine. Time limitation for this project is 6 months (26 weeks), and tools and software used in this project are HTML, MySql, JavaScript, PHP, CSS, WampServer, and Visual Studio Code.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Knowledge Base in Organization Performance**

A knowledge base is knowledge of your product, service or organisation so that workers or consumers may immediately and easily access the information needed. These knowledge bases include a mixture of videos, charts and diagrams which enable users reach desired solution.

Pereira & Bamel (2021) states that firm knowledge is considered as a key resource that determines its competitive advantages. Knowledge base can be beneficial in decision-making and ensuring that all employees are informed regarding the company critical information and updates. These business decisions mainly involve strategic action plans in enhancing business with reference to lean activities, competitors' comparison, customer expectations and needful information for decision making (Muthuveloo et al., 2017). This information is typically shared with all employees in all subsidiaries operating plants in ensuring employees are aware of the course of actions for business sustainability (Muthuveloo et al., 2017). The media for such information sharing could be by newsletters, town-hall meeting, managers meeting, operational meetings, and/or memorandums (Muthuveloo et al., 2017).

Workers and upper levels consistently focus heavily on initiatives, especially collaboration and knowledge exchange, to ensure continued performance and sustainability. Additionally, employees would strive to discover, analyse, and absorb

this knowledge throughout daily activities to prepare themselves with the essential and requisite abilities to perform better at work, which would finally result in evaluation and job stability, in addition to career development. Muthuveloo et al. (2017) highlights that the key benefits that an organisational could gain from knowledgeable workers is the decision-making ability, whereby decision-making process requires an in-depth understanding of the situation and consider all the related advantages and disadvantages prior to making a decision. As a result, only individuals with sufficient knowledge and expertise can make such decisions, emphasising the critical nature of having competent personnel. Thus, management should provide a platform for knowledge production and exchange. Human capital is central for manufacturing competitiveness and product innovativeness. Garcia Martinez et al. (2017) argue that highly skilled R&D staff is a valuable strategy for high and low-tech manufacturing industries to enhance innovation performance as it increases the stock of knowledge of an organisation.

## **2.2 Search Engine and Machine Learning as Website Searching Tools**

Search engine is among the core components of a website and without it, it will become unable to help users who searching for information the search results are presented as a list of page title that are similar to the keyword the user is searching for. The entries in the search list are sorted by the search engine based on certain criteria.

Cooper and Omar (2018) states that internal engines are of a small scope for a company or organisation and are searchable within the local network, and the search process is through the database stored by the company and the company's information only. Search engine algorithm is applied to assist in delivering appropriate search results for queries that are extremely complicated. Information technology is utilised to obtain appropriate results from a large volume of data. The quickest way to obtain web documents is using cutting-edge searching technologies. If the storage memory is not being used correctly, then the data and documents will be unable to be stored. To handle inquiries easily, you need a search engine with good search efficiency.

Data clustering with K-Means involves the development of data clusters from groups of people who have related interests. This form of data mining is a subset of machine learning. Clusters are formed by dividing data sets into separate groups. The idea of compiling data is simple in nature and very close to the human in his way of thinking where whenever we deal with a significant amount of data to summarise a few of the groups or categories, to facilitate the process of analysis (Cooper & Omar, 2018).

### **2.3 Indexing in Database Management Systems**

A database is a structured collection of data that is often stored and accessed digitally through computer. The Database Management System (DBMS) is the software that facilitates data acquisition and analysis by interacting with end users, applications, and the database directly. Additionally, the DBMS software includes the fundamental administration tools for the database. However, according to computer scientists, database management systems may be classified based on their support database models. In the 1980s, Relational Database Management Systems (RDBMS) gained popular. These databases describe data as rows and columns in a sequence of tables, and the great majority of them write and query data using Structured Query Language. In the 2000s, non-relational databases, dubbed NoSQL for their usage of distinct query languages, gained popularity.

Creating indexes is the main task to improve database query performance, since the indexes are the most used technique to speed up queries response. It is important to properly choose the columns to be indexed, given that it also affects time to insert and update data and increase disk consumption (Albert et al., 2020). The primary purpose of an index is to accelerate the execution of queries in database applications (Albert et al., 2020).

Creating an index is to enhance the speed and performance of a search query's results retrieval. Without an index, the search engine will have to scan the whole



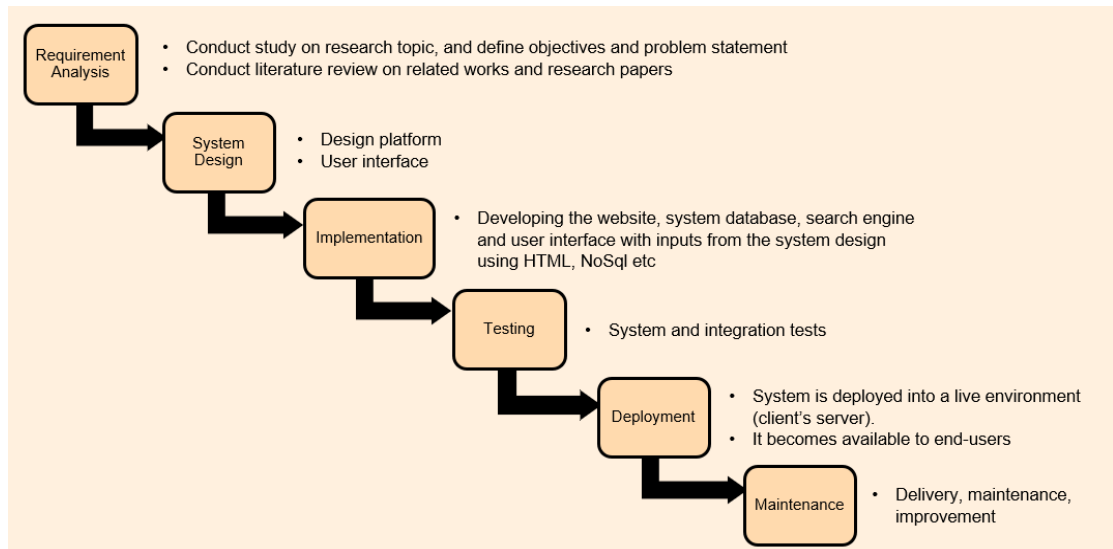
database, which would take a significant amount of time and computer resources. For instance, whereas a query against a 10,000-record index may take milliseconds, a serial scan of each record may take minutes. The greater computer storage necessary to maintain the index, and the significantly increased time required to perform an update, are offset by the time taken upon retrieval.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 Project Methodology**

This system is developed according to the Waterfall methodology as shown in Figure 1. In order to guarantee that all criteria are met and that the system presented meets the predefined goals, the demanding stage is extremely essential and the scope of work and time for execution is also defined. This phase also specifies the final product's functional and technical specifications and is utilised for development. The design phase follows, when a prototype is produced based on the requirements and the complete system layout is designed to move to the next step once accepted. When the development and implementation are finished, the following stage tests for a hidden error, which the developers left unresolved. This step is also crucial in the following stage of the maintenance procedure that guarantees that the system continues to function according to the requirements.



**Figure 1 Waterfall Methodology**

Waterfall is the most common methodology for developing software. Due to its plan-based approach, it was indeed one of the most common ways for web development projects for many decades. The Waterfall method demands a lot of documenting and structure. The process is separated into numerous phases forming a series. Waterfall lacks flexibility and so every phase needs to be completed before proceeding to the next stage. If changes are needed or faults are found during the project, it will need to restart completely. As an outcome, projects managed via the Waterfall approach might take significantly longer. On the other side, it is excellent to make sure all deliverables match expectations and allow progress to be measured simply, as you can see all the project's scope in advance.

Waterfall approach is mostly employed in web development projects with a defined and established objective, a definite project completion period and few variations or modifications.

## **3.2 Tools**

The development of this project is divided into two categories:

### Research Tools

- Open Athens
- Google Scholar
- Science Direct
- Research Gates

### Website Development Tools

- HTML
- MySql
- PHP
- CSS
- JavaScript
- WampServer
- Visual Studio Code

## **3.3 Planning and Requirement Analysis**

This project is structured primarily into two parts: FYP 1 and FYP 2. The continuation of FYP 1 is merely to improve and finish the project, while certain actions need to be carried out again. The first phase is planning, and the collection of information defines requirement analysis. Research on literature review and study current available systems aids in to gather extensive information and decide the project requirements. This is the most essential stage of the project since it defines the Gantt chart's project scope and its schedule. If the project specifications are not valid, the end output will thus not meet the project objectives.

### **3.4 Design**

The case diagram is the visual illustration used to portray the dynamic nature of a system. It comprises of players, cases and their connections. Use case graphic describes how people interact with the system they are proposing. It is used to define the system specifications and external and internal variables influencing the system. The interactions and functionality could be demonstrated via sketching the diagram. Flowchart is also use to develop understanding how the system works and also to document the process.

### **3.5 Development Phase**

The development has been done using HTML, PHP, JavaScript, CSS and SQL and link to the WampServer as the database. However, change, on the other hand, is unavoidable and can take various forms. During the development phase, the complexity of functions such as creating and building an intelligent search engine proves to be more difficult than anticipated. These factors will affect project delivery timelines and add risk to project deliverables and its functionalities.

### **3.6 Testing Phase**

Before proceeding to deploy the system, usability testing was conducted. User interaction and primary tasks will be monitored during the usability testing. In this testing, each task's functionality is evaluated. As stated previously, this ensures that the system generated is following the specifications and objectives. As a result of this testing, most errors will be discovered, and the system will function more smoothly. The overall quality of the system improves when more bugs or errors are found and resolved during testing. Testing that are conducted cover most of the system major functionality. All of the restrictions had been fixed to their maximum extent.

### **3.7 Deployment Phase**

At this point, the system has fulfilled the user's requirements, and all of the system's functions are functioning as intended, assisting the user in the performance of their tasks. Therefore, the system is ready for deployment and is ready to be used by the end user at this point. The entire development process must be documented to ensure that the system can be easily maintained in the long run. At the same time, it would assist the user in comprehending how the system can be utilised effectively. After all of the development work has been completed, the system is ready to use. As a result, end users of the system will be able to put it to use in a real world setting.

### **3.8 Gantt Chart**

The following Table 1 displays the schedule for FYP 1 completion. The Gantt chart also displays critical milestones and project tasks to be accomplished during the project. As shown in Table 1, the first three weeks of FYP 1 involved preparing the project proposal, setting up a meeting with the supervisor, and approving the FYP proposal. The background study is conducted from week 3 until week 11; this includes literature review and currently available systems, preparing for the proposal defence. From week 10 until week 12 the draft of the interim report is reviewed and submitted to the supervisor. FYP 1 was then continued in the next semester, which is FYP 2; the phases of the project is design interface and implementation in the early weeks of FYP 2, which then later continued in development and testing the system and lastly, the viva and dissertation which has been extended the time to week 14 and week 15.

**Table 1 Project Gantt Chart**

Tasks	FYP 1												FYP 2															
	Week	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Project Proposal																												
Background study & Introduction																												
Literature Review																												
Data Collection & Analysis																												
Proposal Defence																												
Requirement Gathering																												
Interim Report																												
Design Interface & Implementation																												
Development and System Testing																												
Viva & Dissertation																												

## **CHAPTER 4**

### **RESULTS AND DISCUSSION**

#### **4.1 System Design**

##### **4.1.1 Use Case Diagram**

This UML use case diagram as shown in Figure 2 shows actor and use cases for the knowledge base website. General users can access the forum according to their accessibility level, which allows them to submit an article or post, update or edit, like and dislike post, and do knowledge searching. They can only view the knowledge and do knowledge searching concerning their level of access. Next actor who is assigned Verifier will check the validity and approve the submitted post or article from general users. Lastly is Administrator actor that manage user access and feedback panel.

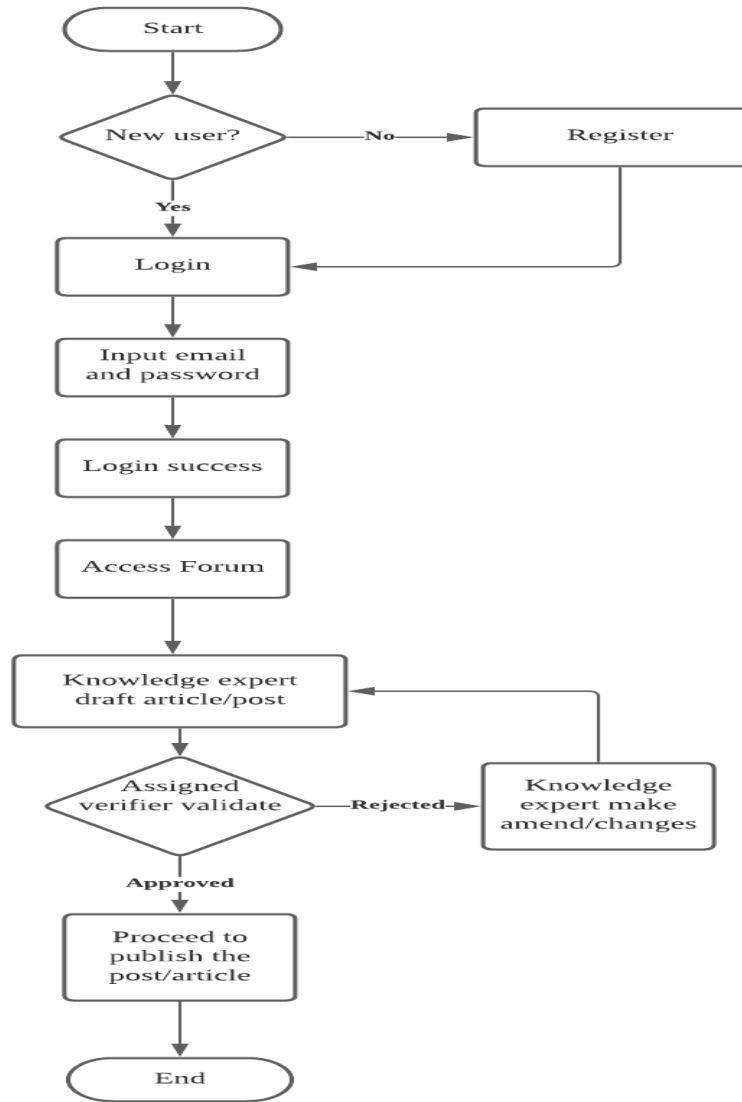




**Figure 2 Use Case Diagram of Knowledge Base Website**

#### 4.1.2 Flowchart

A flowchart is a chronological representation of the different phases of a process. It is a general tool which may be used to define many procedures, including a website workflow or services procedure. As shown in Figure 3, the general user known as a knowledge expert submitted the draft of the post or article. It will be sent to the assigned Verifier, which will validate the draft. If it is good, then the assigned Verifier will publish the drafts, or if it is rejected, the assigned Verifier can make a comment, and the knowledge expert may make amend or do any changes.



**Figure 3 Flowchart of Submitting Article/Post**

### 4.1.3 Search Engine and Indexing

Searcher, analyser, indexer, detector and user access are part of one search engine as shown in Figure 4. The search engine analyses user keywords and obtains an index database with the relevant document list during the search engine. It then scans the document list and matches the key words processed to extract web pages that fulfil requirements. Then, it calculates the degree of association between web page, key phrases and past results. If users click the next page results, the website organisation will search again to order results for users.

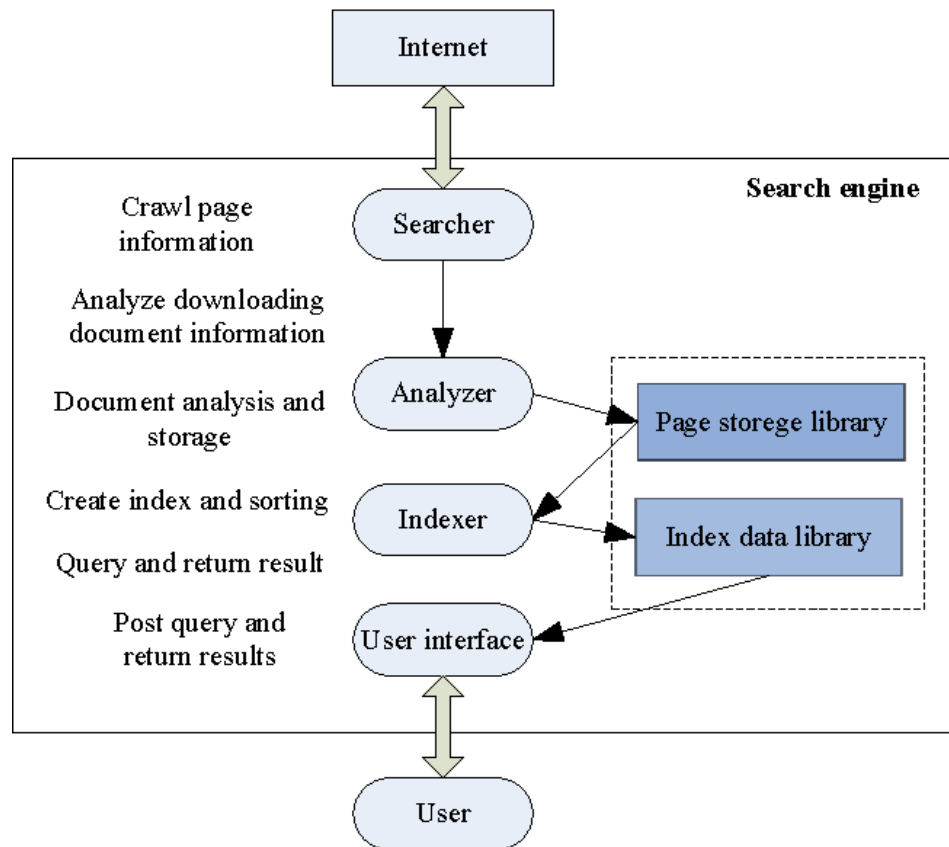
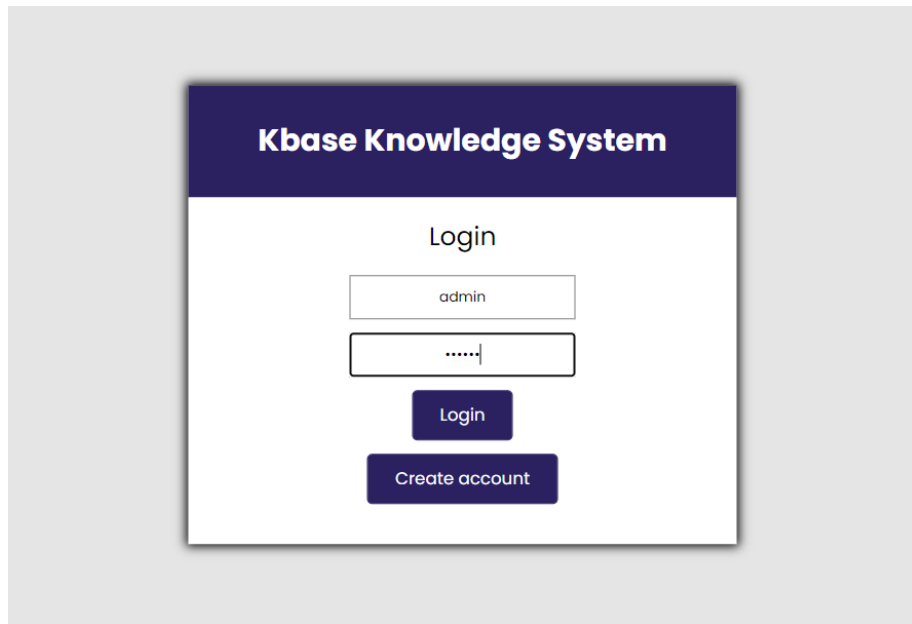


Figure 4 Search Engine Process Flow

## 4.2 Web Application System

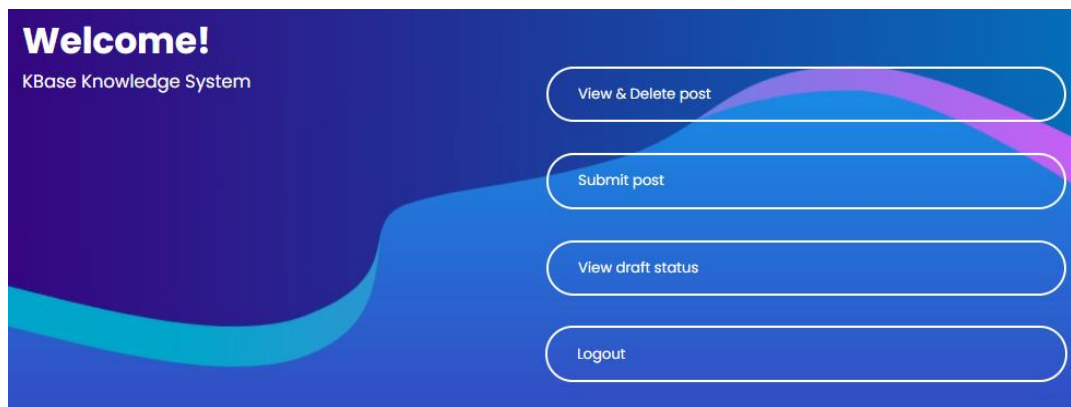
### 4.2.1 Login Page and Home Page

Building the login page was the first step in developing the Knowledge Base website. The login page allows the company to verify the user's identification and authentication to access the website features. The new user must create an account to enable them to control their information or setting on the website and security purposes. Employees (users), as shown in Figure 5, will begin interaction with the system by signing in and entering the system using their corporate email and password, which they set up at the beginning of their sign-up steps.



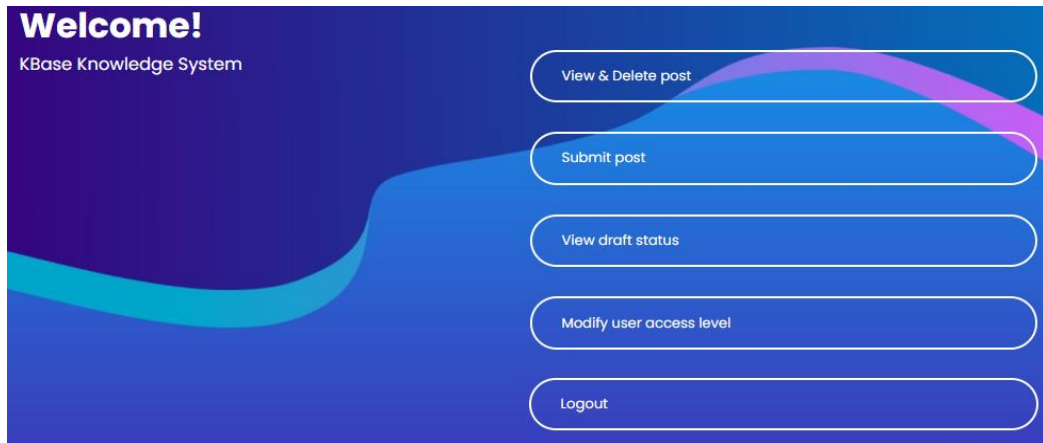
**Figure 5 Login Page for All User**

After the user has login into the website, they will see the index page or home page based on their respective level of access. As shown in Figure 6 normal user can access “View & Delete post”, “Submit post”, “View draft status”, and “Logout” page by clicking the button.



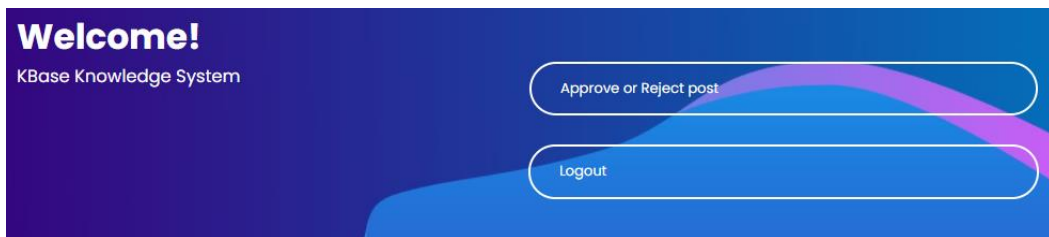
**Figure 6 Home Page for User**

Admin can access the same as regular users, but it has one extra button that allows them to modify and change user access level in Figure 7



**Figure 7 Home Page for Admin**

Meanwhile, Verifier can access the “Approve or Reject post” and “Logout” page as shown in Figure 8.



**Figure 8 Home Page for Verifier**

Users can be authorised at three levels: employee (user), Verifier, and Admin. Each level has a different role of access in viewing the contents and functionality of the system, and the administrator will manage the system in terms of user access levels for the system.

#### **4.2.2 Submit a Post Page and View Draft Status Page**

User and Admin have access to submit a post shown in Figure 9. On this page, users can enter the title, keyword, and content of their article. The keyword is for easier knowledge searching and storing. Once the user finishes writing their article,

they can click the submit post button, which will send to the Verifier page and up for their approval.

**KBase Knowledge Management**  
Submit Post

Post Title:  Keywords (separate with commas):  Author:

Post Content:

[Submit Post](#) [Back](#)

**Figure 9 Submit Post Page**

Next, users can see the status of the submitted post on the View Draft Status Page. If the Verifier has not approved the draft submitted, it will show that the status is pending, as shown in Figure 10.

**View all draft posts**  
View details of all submitted draft posts

Id	Title	Author	Content	Keyword	Date Created	Status
17	Troubleshooting Android apps	sarah	When a mobile app acts up, the culprit is often corrupted data. Many apps cache bits of data—like a friend's recent status update or a menu icon—in your phone's local storage. This lets you access the app more quickly the next time you pull it up. However, the locally stored information can...	app, crash, crashing, app stuck, stuck	2021-11-25 23:00:41	Pending

[Back](#)

**Figure 10 View Draft Status Page**

### 4.2.3 Approve Draft Page

Verifier can view all of the draft posts submitted by registered users on this page. After checking is done, the Verifier can proceed to approve the post by clicking the approve button. The system will then capture the action and load the post into the knowledge inventory database, and in this project, we use MySQL through a local web server, WampServer.

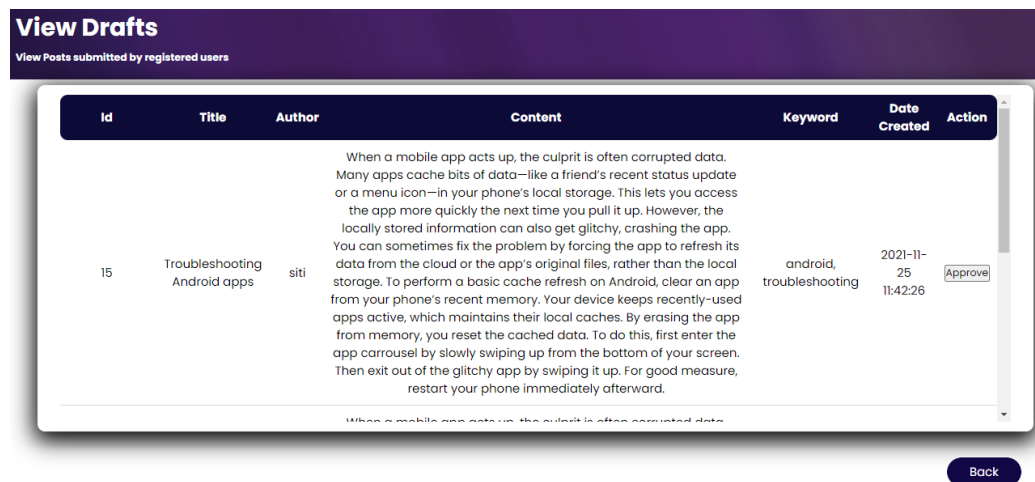


Figure 11 Approve Draft Page

### 4.2.4 Article Search Page

This function allows the user to search for any available articles in the search box; the search category options for id, title, content, and keyword are all available for the user to choose from. It makes searching for information more convenient for the user, as shown in Figure 12.

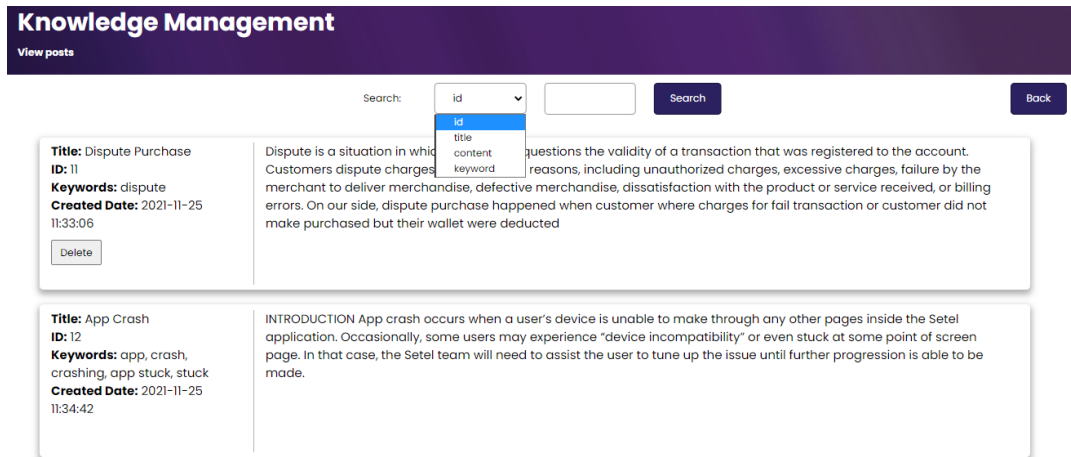


Figure 12 Search Page

Once the user inputs the keyword in the search box, the system will run the query string against the database, and the search result will be shown in Figure 13.

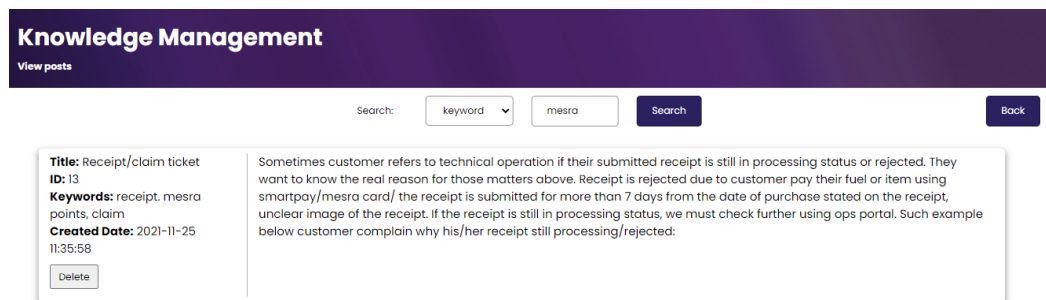


Figure 13 Search Page Result



## 4.2.5 Modify User Access Level

Admin has the functionalities to modify or change user access levels. User access levels can be changed by editing on the Role column and clicking the updated button. There are three types of user access levels: User (employee), Verifier, and Admin. A pop-up notification will be shown on the screen once the role has been successfully updated in the database.

The screenshot displays the 'View all users' interface. At the top, a notification box states 'localhost says Successfully updated!' with an 'OK' button. Below this is a table listing users with their details and an 'Update' button for each row.

Id	Username	Email	Role	Action
1	khairul	khairulaiman@iplace.my	user	<input type="button" value="Update"/>
2	sarah	sarah_suhairi@iplace.my	admin	<input type="button" value="Update"/>
3	verifier	azahari@iplace.my	verifier	<input type="button" value="Update"/>
4	siti	siti@iplace.my	user	<input type="button" value="Update"/>
12	admin	admin@iplace.my	admin	<input type="button" value="Update"/>

Back

Figure 14 User Access Level Page

### 4.3 Usability Testing

Tables below shows all the result of the testing done.

**Role:** Admin, Verifier, and Users

**Table 2 Usability Testing: Task 1**

<b>Task 1</b>	
<b>Goal</b>	View and Search Post (Admin & Users0
<b>Inputs</b>	Choose keywords, title, content, and id. from the options available
<b>Assumptions</b>	View specific article
<b>Steps</b>	<ol style="list-style-type: none"><li>1. Fill out username and password</li><li>2. Click Login</li><li>3. Click View/Delete post button</li><li>4. Enter keywords/id/title/content in the search box</li><li>5. Click submit</li><li>6. Relevant article shown</li></ol>
<b>Fail/Success</b>	Success
<b>Notes</b>	Successfully search the relevant article based on user query.

**Table 3 Usability Testing: Task 2**

<b>Task 2</b>	
<b>Goal</b>	Submit Post (Admin & User)
<b>Inputs</b>	Fill title, keywords, and contents
<b>Assumptions</b>	Draft post submitted for approval
<b>Steps</b>	<ol style="list-style-type: none"><li>1. Fill in the title, keyword, and content</li><li>2. Click submit</li></ol>
<b>Fail/Success</b>	Success
<b>Notes</b>	<ul style="list-style-type: none"><li>- Draft successfully submitted for approval</li><li>- Users are not able to upload and attach a file such as pdf, words, and images.</li></ul>

**Table 4 Usability Testing: Task 3**

<b>Task 3</b>	
<b>Goal</b>	Approve Draft Post (Verifier)
<b>Inputs</b>	Click approve button
<b>Assumptions</b>	Post successfully adds in knowledge inventory
<b>Steps</b>	<ol style="list-style-type: none"><li>1. Click “Approve or Reject post”</li><li>2. Click “Approve or Reject” button</li><li>3. Updated in knowledge inventory database</li></ol>
<b>Fail/Success</b>	Success
<b>Notes</b>	<ul style="list-style-type: none"><li>- Post successfully updated in the knowledge inventory database.</li><li>- Users can search the article in “View/Delete post”</li><li>- Reject features are not working</li></ul>

**Table 5 Usability Testing: Task 4**

<b>Task 4</b>	
<b>Goal</b>	Modify User Access Level (Admin)
<b>Inputs</b>	Fill and edit user access level
<b>Assumptions</b>	Change the user access level
<b>Steps</b>	<ol style="list-style-type: none"><li>1. Click “Modify user access level.”</li><li>2. Click “Role”</li><li>3. Edit and change to three options admin, Verifier, and user.</li><li>4. Updated in user’s database</li></ol>
<b>Fail/Success</b>	Success
<b>Notes</b>	<ul style="list-style-type: none"><li>- Successfully updated in the user’s database.</li><li>- The dropdown option button would be more suitable</li></ul>

**Table 6 Usability Testing: Task 5**

<b>Task 5</b>	
<b>Goal</b>	View Draft Status (Admin & User)
<b>Inputs</b>	View draft status
<b>Assumptions</b>	Get the status of the draft
<b>Steps</b>	<ol style="list-style-type: none"><li>1. Click “View draft status.”</li><li>2. View draft status if pending, approved, and rejected</li></ol>
<b>Fail/Success</b>	Success
<b>Notes</b>	User not able to see if the draft is rejected

#### **4.4 Discussion**

The Knowledge Base web system is only intended to be used by the internal employees of an organisation only. Based on the result discussed above, a significant part of the system has met its initial functionality. Usability testing also has been conducted to assure the intended functionalities is working as it should. However, this system has more limitations; for example, the functionality of the submit post cannot attach format files such as pdf, words, and images to be uploaded with the content of the post.

Besides, the search system can only be searched up to 4 categories; the challenges of making the search features to be AI like is due to the time limitation and skills to develop it to work properly.

The Knowledge Base web system will still have much improvement to be done. For instance, soon, the system can be a vital move for organisations to analyse the knowledge inventory stored in their database to be used to improve productivity and performance.

## **CHAPTER 5**

### **CONCLUSION AND RECOMMENDATION**

#### **5.1 Relevance to the Objectives**

Overall, the objectives of the project have been met which is to make knowledge sharing, searching and storing easier in an organisation, to setup platform and design its functionalities and the system and to develop an intelligent search engine for knowledge searching. The prototype application has been tested for usability after three months of development, as discussed in Chapter 4. No critical system functions were found to be malfunctioning during testing.

This project aims to provide a functional website that may serve as a knowledge base for the company on a single platform, increasing productivity and efficiency. Having a knowledge base is more than simply putting information in a centralised spot; it is also about gaining insight into the material. It is a productivity tool, a means of having everything at the tip of one's fingers, and above all, it is a worthy investment for any business out there looking to grow. In conjunction with this, an appropriate knowledge base may be established to facilitate the sharing and transfer of information more effectively.

## 5.2 Recommendation

Certain aspects of this project have the potential to be further developed in the future. With practically any project that has a software component, the possibilities for future expansions are practically infinite.

This recommendation will merely draw attention to the significant areas where further effort might benefit the project.

- Developing an intelligent search engine, which includes artificial intelligence (AI) searching tools that make knowledge searching convenient, is an obvious first step.
- The next step could be to include an in-depth analyses report that can be generated automatically by the system based on the knowledge inventory database, which can be very useful in monitoring and assessing the company's business problems and performance.

In order to properly examine all of the additional capabilities of the system that can benefit the business as a result of having a knowledge base system, additional time would be required. as well as skills. While detailed in the general idea of how this may be accomplished, the particular work involved would be better suited for a separate project. Aside from that, the systems' and objectives' primary functions have been accomplished..

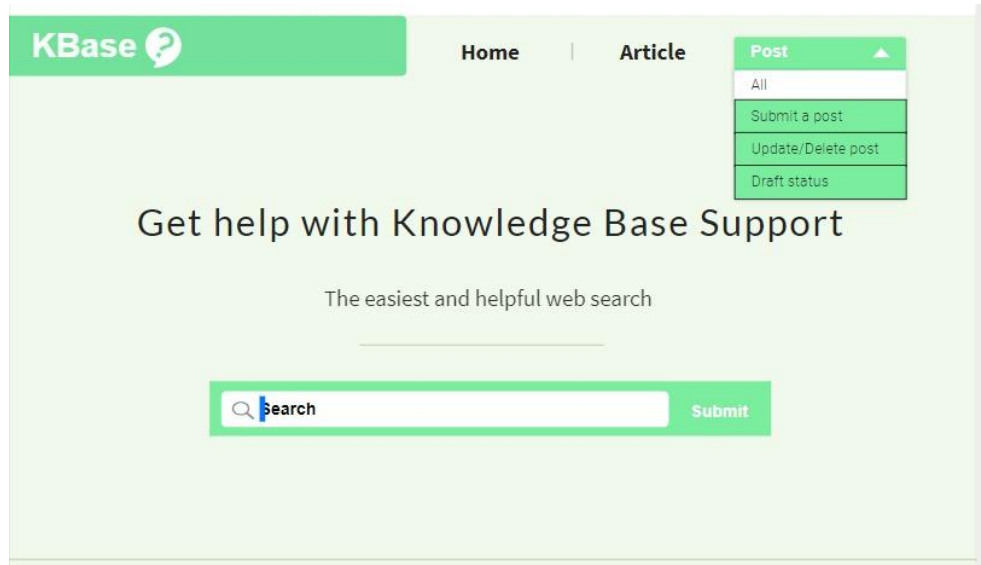
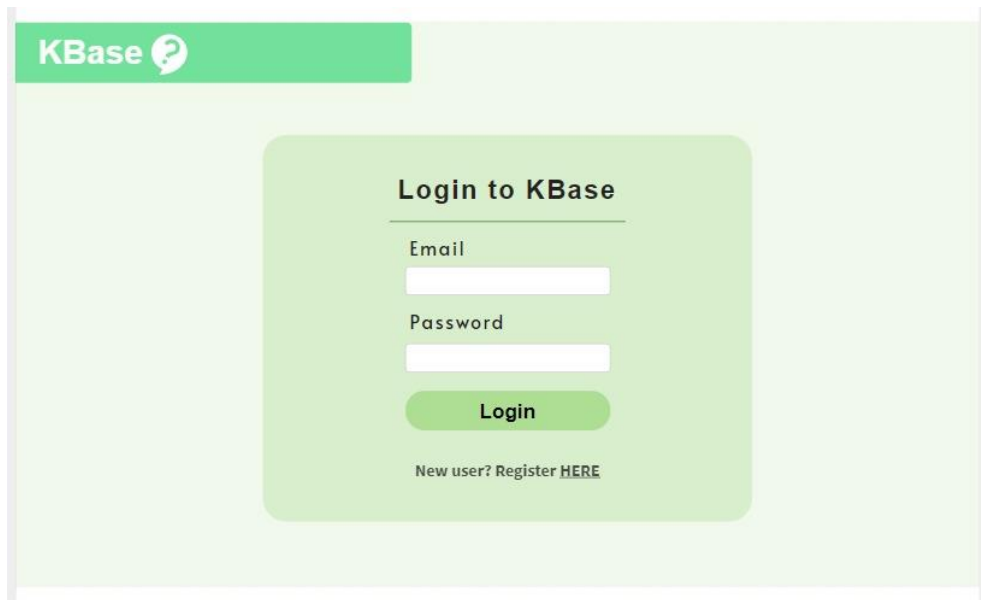
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# APPENDICES

## User Interface Pre-design



## Article

### Dispute Purchase

Dispute is a situation in which a customer questions the validity of a transaction that was registered to the account. Customers dispute charges for a variety of reasons, including unauthorized charges, excessive charges, failure by the merchant to deliver

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