UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SECD 2523 - Database
SECD 2613 - System Analysis and Design

PROJECT PROPOSAL

PROJECT NAME: INTERN DOCTOR

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SECTION: 01

GROUP 5

GROUP MEMBERS:

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1. INTRODUCTION

The internship website is a platform for college students to find the workplace to gain experience. The internship is important for college students to apply the knowledge from the class to a real working environment. This is a chance for college students to develop their professional skills and strengthen their personalities. There are a few internship websites on the Internet for college students to look for a position such as LinkedIn and Intersheep.com. The reason why internship websites are becoming more and more popular is because of the development of networks around the world. Companies can easily promote the positions they are looking for through the website while college students can easily find the positions they want through the promotion of the company. The main reason is that the company can view the resume of college students from the internship website to determine whether the interviewee is the person they want. This results in saving time for the company and interviewee.

Universiti Teknologi Malaysia has developed an Industrial Training System for college students to apply for internships. With this system, the administrators are able to ensure all the college students have applied for an internship program. College students are also able to search for the company through the list of companies in the system.

2. BACKGROUND STUDY

The Industrial Training System provides a platform for the administrators and college students to communicate with each other. However, there are limitations to the system. Administrators and college students cannot ensure the legality of the company. There is no platform for interns to evaluate the company. This condition will cause the college students to have no idea regarding the treatment of the company. Besides that, the system did not provide message notification alerts causing the administrators and college students to miss the message. Moreover, some tasks in the Industrial Training System must be done by manual control, which puts a burden on the administrator’s work. Hence, we are hoping to develop an internship system which can meet users' needs and overcome the limitations on the Industrial Training System.

3. PROBLEM STATEMENT

The first issue with the Universiti Teknologi Malaysia's Industrial Training System system is that it does not provide a platform for both data administrators and the company to observe each other. The data administrators are unable to observe the company to which the students have applied, while the company is unable to obtain the student's resume. This is significant because students may be involved in job scams and go unnoticed, while the company is unable to select students based on their preferences. Second, the system does not provide a progress bar for students to see whether or not their application has been approved. Third, this system does not provide students with reminder settings such as application due date, number of applications for documents, and so on. This makes it difficult for students to locate themselves in the systems.

Next, the system does not provide an interface through which the company can advertise itself. The advertisements are capable of providing opportunities for students to easily find internships while also assisting the company in promoting themselves among students. Furthermore, the system does not provide a communication interface for the company, data administrator, and students to communicate with one another, where students can send their resumes or chat with the company directly. Furthermore, the system does not provide an interface for the company to conduct online interviews or pitch sessions with students. Last but not least, students are unable to demonstrate a history of internship employment in some of the system's companies. This makes it difficult for students to demonstrate their abilities and makes it difficult for companies to select them for internships.

4. PROPOSED SOLUTION

The system we are developing will aid in the resolution of the system's problem. The system will serve as a communication platform for companies, data administrators, and students. This platform enables companies to promote themselves through advertisements, while students can submit their resumes if they are interested in working for the company. Besides, the advertisements will be filtered so that they include the company's organisation, general information, and vacancy information. This will prevent the platform from displaying pointless advertisements. However, the system is only available to registered companies. Before their registration is approved, the company's background will be investigated. The investigation is carried out by verifying the company identification through Suruhanjaya Syarikat Malaysia (SSM).

Furthermore, this platform allows data administrators to monitor the company's integrity, while the company can obtain resumes dropped by students. This platform also allows for online session interviews or pitching sessions to be held in order to interview students. Aside from the multifunctional platform in the system, the system developed has improvements in system documentation where students can display their internship employment history. Finally, the application letter will include a progress bar that will inform students whether their application has been approved or rejected. When a student's application status changes, either approved or rejected, they will receive an email notification. If students fail to apply the document before the deadline, the system will send a reminder via email to them.

5. FEASIBILITY STUDY

5.1 TECHNICAL FEASIBILITY

This system can operate on personal computers and mobile devices. The maintenance of the system will be performed by the system administrator. Administrators can only log in via UTM's Virtual Private Network (VPN). For the database management system, only administrators can access and also should be accessed via UTM's VPN. The normal interface can be accessed by students, supervisor, administrators and company by their smartphone and no need to use VPN so the system can be used easily and conveniently.

5.2 OPERATIONAL FEASIBILITY

The system should be easy to use. The target users are UTM students, UTM staff and company. The system has a simple user interface which has three types including students, administrator and company view. Users can just simply click on the button of the function they want, for example, click the "apply" and send the resume to the company they wish to apply to. All the functions are easy to understand and no extra knowledge is needed. To maintain the system, staff in UTM may be involved in the system maintenance process so it can reduce the cost.

5.3 ECONOMIC FEASIBILITY

Hardware and software that are includes to develop the internship system:

I. Hardware: Storage, Internet and End System,

II. Software: Operating system and firewall

ASSUMPTIONS	
Discount rate	3%
Sensitivity factor (cost)	1.5
Sensitivity factor (benefits)	1.5
Annual change in production costs (Salary)	1.5%
Annual change in production costs (Maintenance)	4%
Annual change in benefits	4%

Table 1: Assumptions of Cost Benefit Analysis

ESTIMATED COST (RM)	
Hardware	1,650
Software	5,500
Training	4,000
Maintenance (per year)	10, 000
Salary (per year for administrator)	30,500

Table 2: Estimated Cost of Cost Benefit Analysis

ESTIMATED BENEFITS (RM)	
Advertisement Cost (per year for 1 company)	500
Number of company (per year)	100

Table 3: Estimated Benefits of Cost Benefit Analysis

	YEAR					
COSTS	**0**	**1**	**2**	**3**	**4**	**5**
DEVELOPMENT COSTS						
Hardware	2475					
Software	8250					
Training	6000					
Total	16725					
PRODUCTION COSTS						
Salary		45750	46436	47133	47840	48558
Maintenance		15000	15600	16224	16873	17548
Annual Production Costs		60750	62036	63357	64713	66106
Present Value		58981	58475	57981	57497	57024
Accumulated Costs		58981	117456	175437	232934	289958

	YEAR					
BENEFITS	**0**	**1**	**2**	**3**	**4**	**5**
Advertisement Cost (100*500 per year)		75000	78000	81120	84365	87740
Present Value		72816	73522	74236	74957	75685
Accumulated Benefits		72816	146338	220574	295531	371216
Gain or Loss		13835	28882	45137	62597	81262
Profitability Index	81262/16725 = 4.86					

Table 4: Cost Benefit Analysis

From table 4, we know that the profitability index is 4.86, greater than 1. It shows that this is a good investment.

6. OBJECTIVES

- To create an online internship system that is easily to use by users
- To organize the database system of students information
- To organize the database system of the company
- To ease the work of administrator
- To ease the process of finding internship by students
- To ease the company to absorb talents

7. SCOPE

The scope of the project are:

Users

Students

- Students can use the system to find the company that suitable for their internship based on their field and requirement
- Students can provide own details
- Students can see the history of company's employment

Supervisor

- Supervisor can track the students' internship application progress

Company

- Company can display their advertisement
- Company can display their details and vacancy for jobs
- Company can accept or reject the application by students

Administrator

- Administrator can create and manage users from back end
- Administrator is responsible to approve and display the advertisement of company
- Administrator is responsible to verify the background of the company
- Administrator is responsible for the maintenance and the security of the system

System

Resume template

- Resume template is provided for students to download and apply internship

Notification

- The system will send notification to administrator and company when have students apply for internship
- The system will send notification to students and administrator when company accept/reject the application
- The system will send notification to students to remind the due date for application

Registration

- This system enables students registration for internship
- This system enables company to register so it can accept students for internship in this system

Chat

- This system enables communication between administrator, company and students

Interview

- This system enables company to interview students online

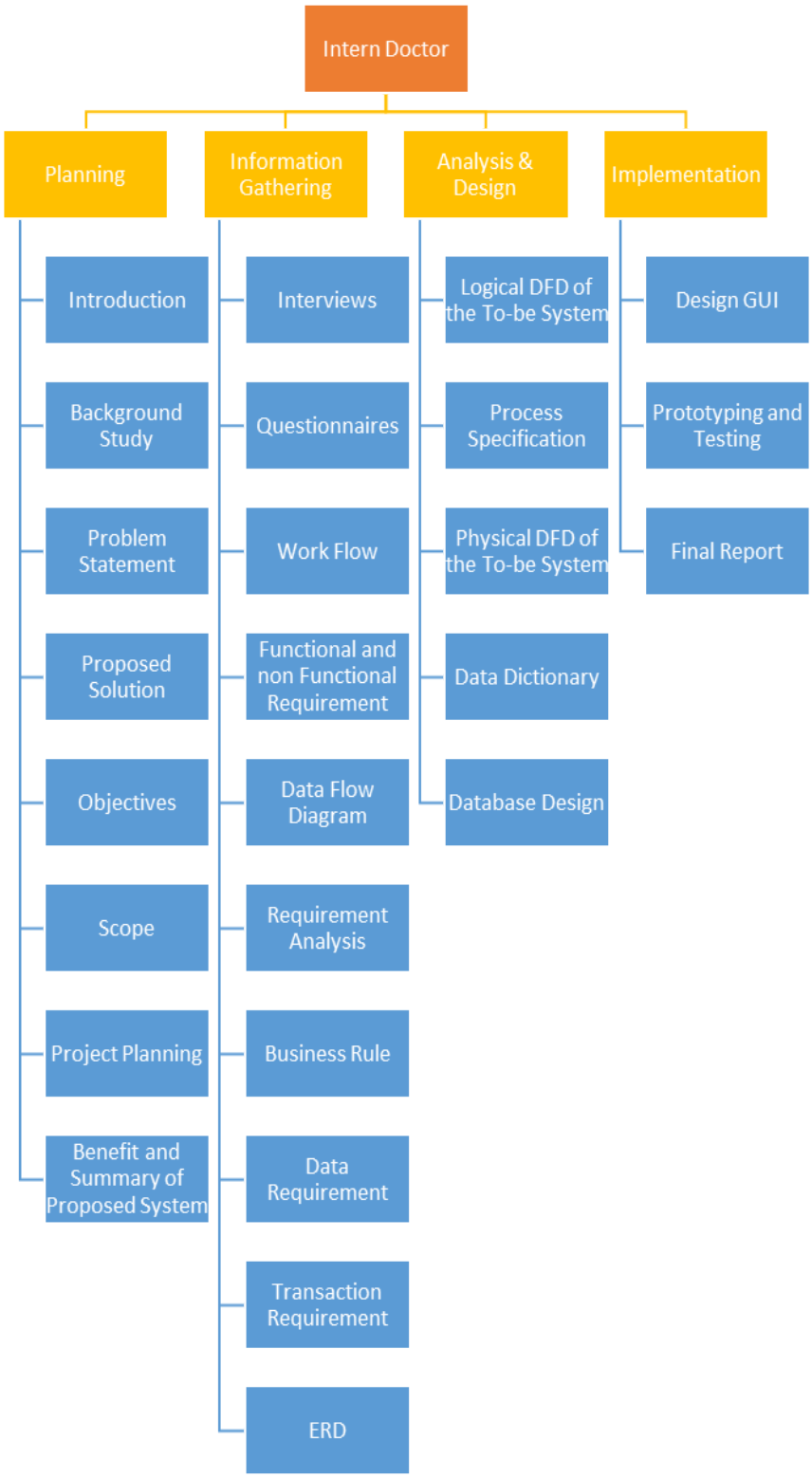
Application progress

- This system enables students to check their application progress

8. PROJECT PLANNING

8.1 HUMAN RESOURCE

8.2 WORK BREAKDOWN STRUCTURE

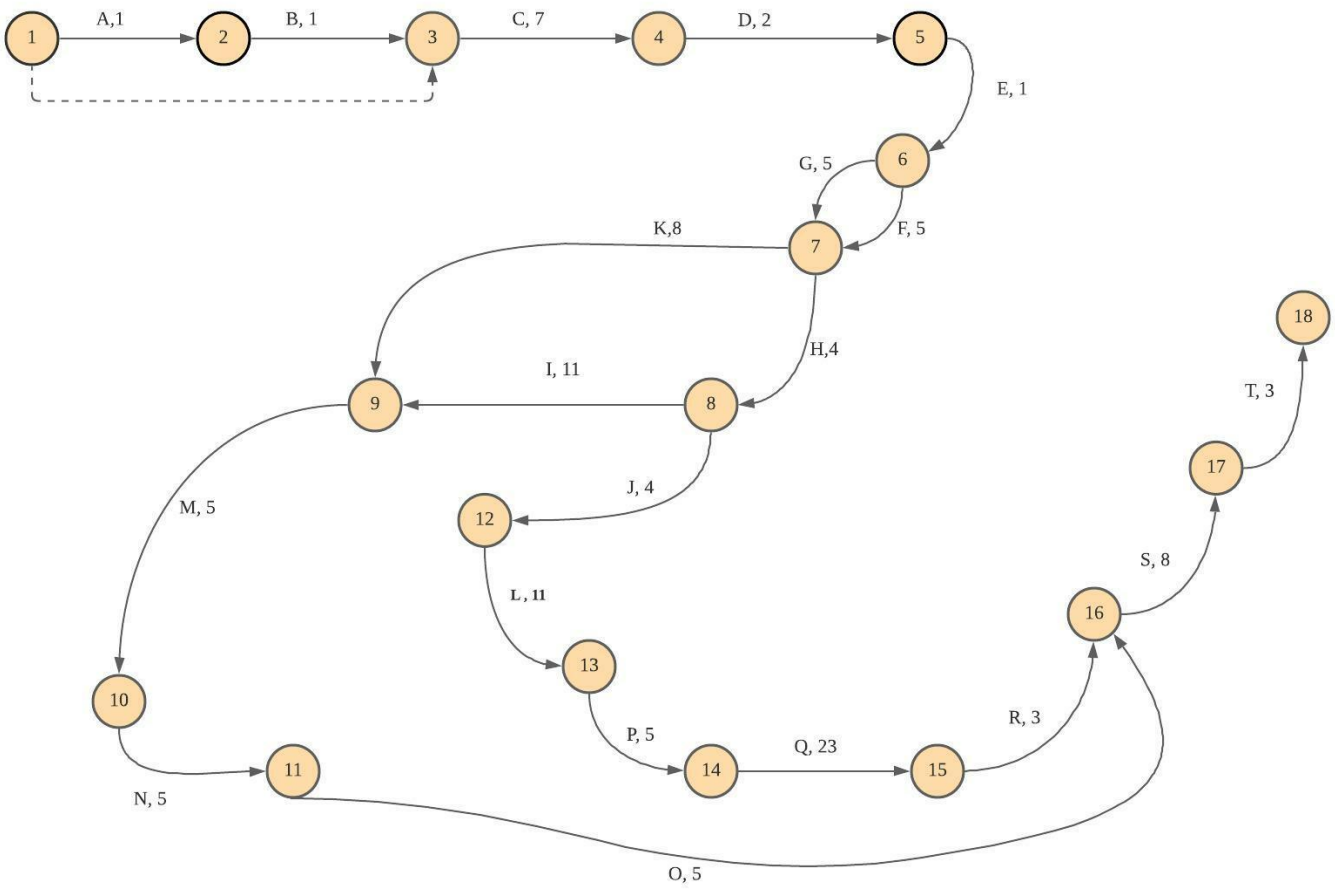


8.3 PERT CHART

TASK	ACTIVITY	PREDECESSOR	DURATION (DAYS)
A	Attend Workshop 1	None	1
B	Attend User Requirement Interview	A	1
C	Prepare Proposal	A, B	7
D	Finalize Proposal	C	2
E	Submit Proposal	D	1
F	Conduct Interview	E	5
G	Conduct Questionnaires	E	5
H	Generate Workflow	F, G	4
I	Create Data Flow Diagram	H	11
J	Conduct Business Rule	H	4
K	Analyze Requirement	F, G	8
L	Create ERD	J	11
M	Logical DFD of The To-be System	I, K	5
N	Process Specification	M	5
O	Physical DFD of The To-be System	N	5
P	Data Dictionary	L	5
Q	Database Design	P	23
R	Design GUI	Q	3
S	Prototyping and Testing	O, R	8
T	Final Report	S	3

Table 5: Pert Chart

Pert diagram



Path 1= A-B-C-D-E-F-H-J-L-P-Q-R-S-T
= 1+1+7+2+1+5+4+4+11+5+23+3+8+3
= 78 days

Path 2 = A-B-C-D-E-G-H-J-L-P-Q-R-S-T
= 1+1+7+2+1+5+4+4+11+5+23+3+8+3
= 78 days

Path 3 = A-B-C-D-E-G-H-I-M-N-O-S-T
= 1+1+7+2+1+5+4+11+5+5+5+8+3
= 58 days

Path 4 = A-B-C-D-E-F H-I-M-N-O-S-T
= 1+1+7+2+1+5+4+11+5+5+5+8+3
= 58 days

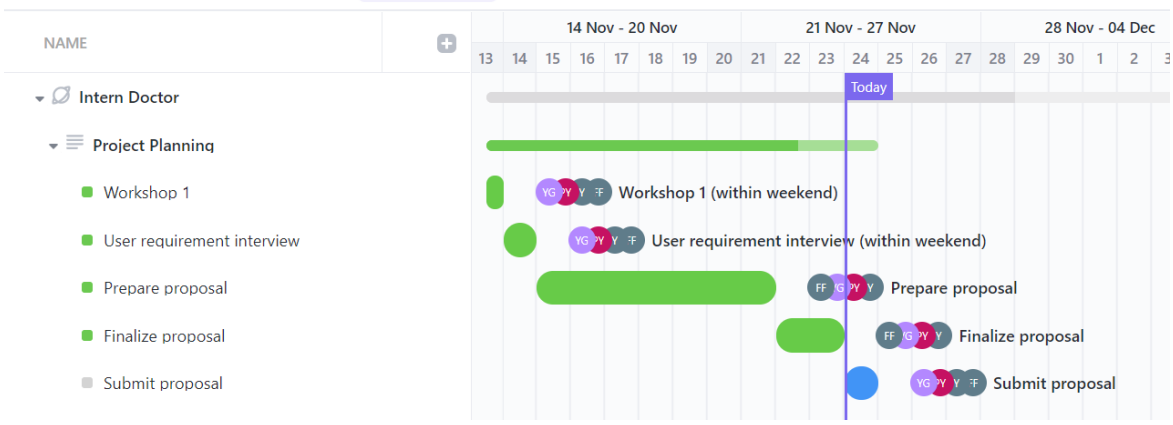
Path 5 =A-B-C-D-E-G-K-M-N-O-S-T
= 1+1+7+2+1+5+8+5+5+5+8+3
= 51 days

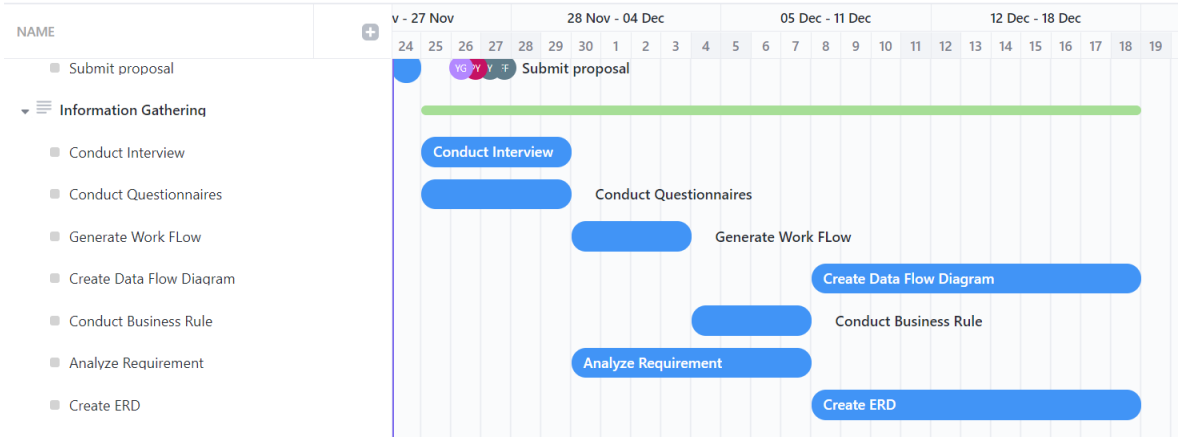
Path 6 =A-B-C-D-E-F-K-M-N-O-S-T
=1+1+7+2+1+5+8+5+5+5+8+3
=51 days

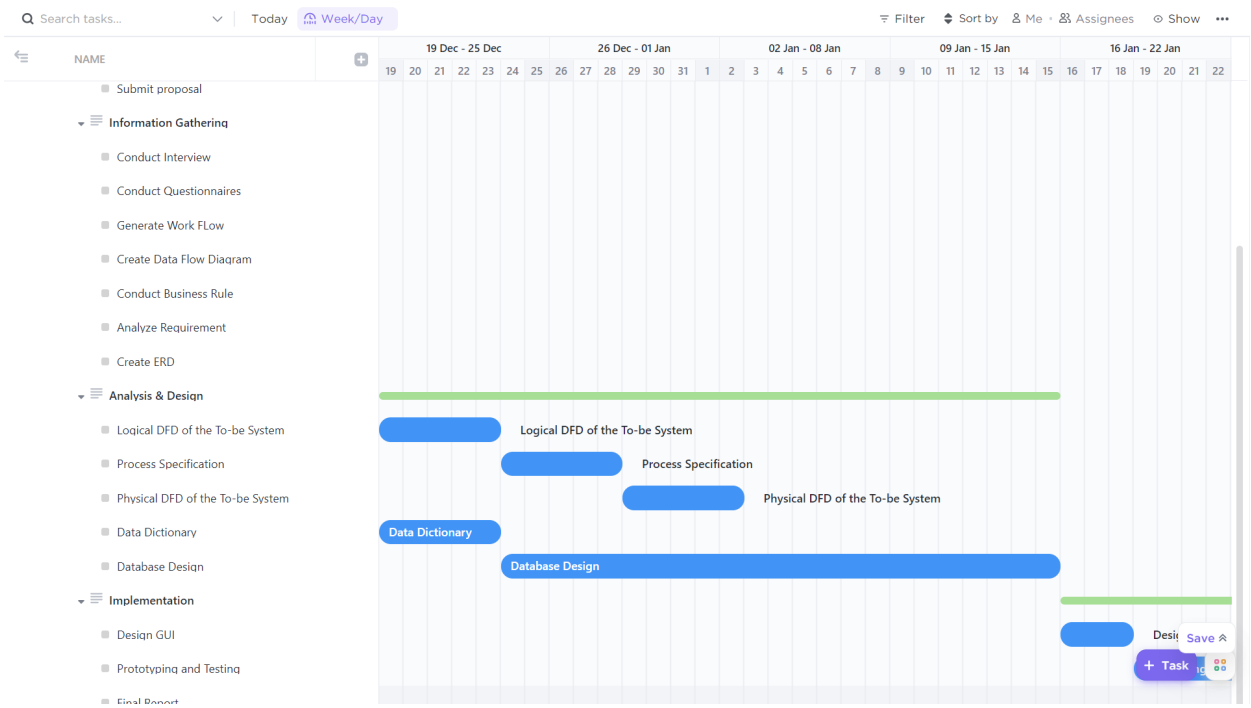
Critical path is Path 1 and Path 2.

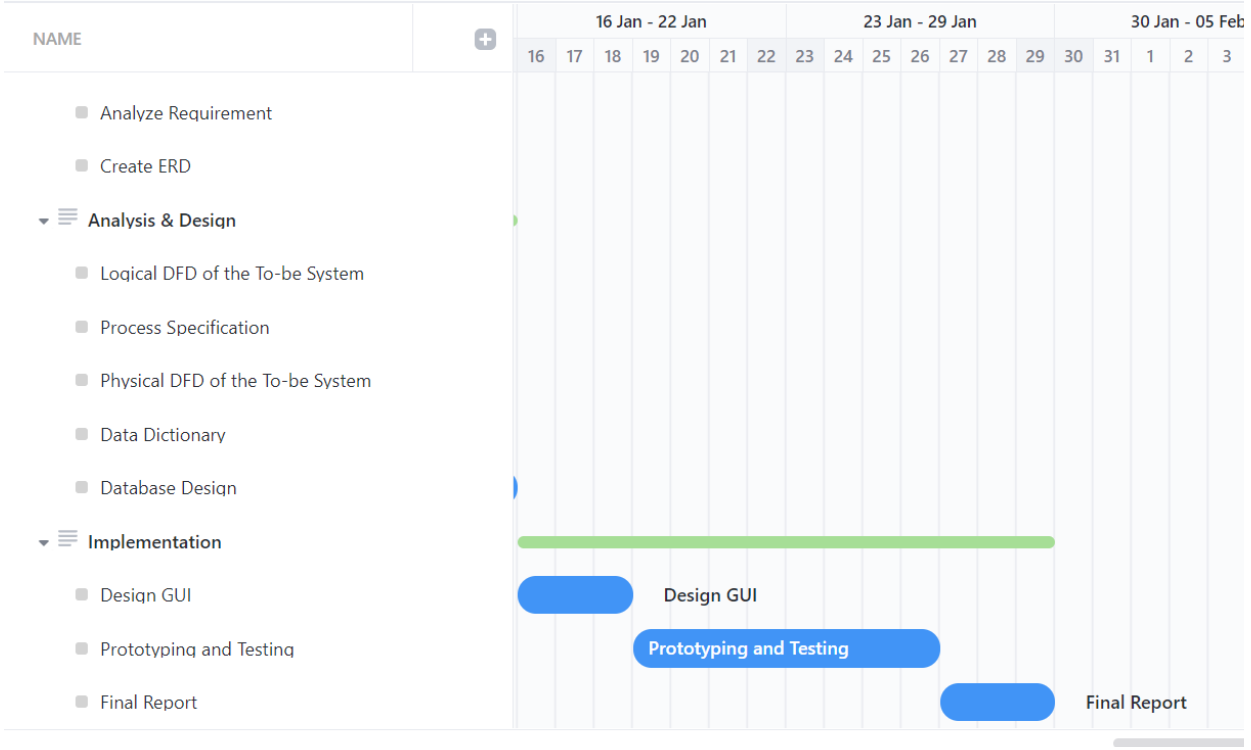
8.4 GANTT CHART

Link: https://app.clickup.com/25555781/v/g/4-43595801-7






Search tasks...
Today
Week/Day
Filter
Sort by
Me
Assignees
Show
NAME
19 Dec - 25 Dec
26 Dec - 01 Jan
02 Jan - 08 Jan
09 Jan - 15 Jan
16 Jan - 22 Jan
Submit proposal
Information Gathering
Conduct Interview
Conduct Questionnaires
Generate Work FLow
Create Data Flow Diagram
Conduct Business Rule
Analyze Requirement
Create ERD
Analysis & Design
Logical DFD of the To-be System
Process Specification
Physical DFD of the To-be System
Data Dictionary
Database Design
Implementation
Design GUI
Prototyping and Testing
Logical DFD of the To-be System
Process Specification
Physical DFD of the To-be System
Data Dictionary
Database Design
Save
Task


NAME
16 Jan - 22 Jan
23 Jan - 29 Jan
30 Jan - 05 Feb
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3
Analyze Requirement
Create ERD
Analysis & Design
Logical DFD of the To-be System
Process Specification
Physical DFD of the To-be System
Data Dictionary
Database Design
Implementation
Design GUI
Prototyping and Testing
Final Report
Design GUI
Prototyping and Testing
Final Report

9. BENEFIT AND SUMMARY OF PROPOSED SYSTEM

9.1 BENEFIT OF INTERN DOCTOR SYSTEM

Tangible Benefits

- Increase the productivity to avoid the repeat task
- Improve the process efficiency to reduce the time required to complete the application
- Gain extra resource benefits such as advertising fee paid by the companies

Intangible Benefits

- Enhance users experiences such as use the functionality on system interface easily
- Increase users satisfaction due to the addition of new functionality

9.2 SUMMARY

Nowadays, students have more convenient ways to apply for their internship through an online platform provided by the university. The functionality of an industrial training system is critical in helping students, administrators and companies to manage the process of internship of students holistically.

Our proposed system is to improve the current industrial training system by adding several features. Firstly, both company and administrator may observe the status of students mutually to make sure their internships are progressing well in respective companies. This mutual interaction enables companies to obtain the resume of students conveniently during the application period and filtration of students' applications can be done easily to make sure there is no overlapping employment at the same time. Moreover, administrators are able to filter out the unreputable and untrusty companies from the application list by verifying the background of the company before approving the registration of the company into the system in order to ensure students apply for legitimate companies. This system also makes the communication between administrators and students become easier.

Besides, progress bars of approval and reminder functions are also added to ease student preparation. The students can easily visualize the approval of their application and always check for their readiness in preparing the important documents such as approval letter. The reminder will remind students about the important dates such as the due date of application for companies.

In addition, one of the new features which is the company advertisement interface in this proposed system enables the companies to promote themselves and let the students have further understanding about the company before applying. Meanwhile, the chances for students to get offered will increase. Students are also able to check the employment history of companies.

In conclusion, the Intern Doctor system provides an excellent platform for users such as administrators, supervisors, students and companies to communicate between each other effectively. The new and advanced functionality in the system will enhance the user experience and increase their satisfaction when using this system. The profits gained from the advertisement fee will also help in reducing the maintenance cost. Undeniably, our system will definitely bring a lot of benefits to every user.

10. REFLECTION OF WORKSHOP 1

10.1 USER REQUIREMENT

First of all, I was honored to have an opportunity to participate in Ts. Haslinda Rasip's workshop on user requirements. Before that, I did not know anything about user requirements. However, after her explanation, I understood why user requirements are so important to produce a product.

According to the speaker, user requirement is a process that helps us to understand and determine what we are supposed to build and why we build it. Speaker had provided 3 gathering requirements processes which are requirements elicitation, requirements documentation and requirements understanding. These processes are important in building a project or producing a product. This is because these processes provide an opportunity for us to gather the information that are needed in building a project or producing a product and ensure everyone knows what we are trying to do.

Besides that, the speaker had shared the tips that were able to help us in gathering the user requirements. These techniques are useful because they can help us to set clear goals and paths when building a project. Moreover, the speaker showed us good requirements for capturing. From the demonstration, I know that there are several ways to perform good user requirements. The most important thing is that we must have clear goals and do projects consistently. Besides interviews, we can also obtain user requirements through other methods.

In the Q&A session, the speaker said that when we want to upgrade the existing system, we must understand what we have now and what we will do. This will help us analyze the gap between the existing system and the current system. Sometimes, users will change their needs at any time. Hence, we have to evaluate and analyze new user needs and find a solution to overcome this situation. Through the speaker's answer, I learned that the priority of user needs is based on the significant impact of a project on

users. Sometimes, we can provide some solution for conflicts and users will make decisions based on the solution we provide.

The speaker said that when carrying out a project, we must be experts in providing solutions and evaluating all aspects. This is the best way to build trust between us and our users. Then, the scope will be released after finalizing the user requirements. Last but not least, asking for permission to take note of the information is important to prevent the security issues.

In conclusion, I had a deeper understanding of the user requirements. The knowledge I had gained from the workshop is helpful in order to complete the project.

10.2 PROJECT PLANNING AND MANAGEMENT

First and foremost, I would like to thank the speaker, Mr Azmi Kamis, for taking the time to share his knowledge on project planning and management with us. The workshop began with an overview of the speaker's general information where the speaker is an experienced project manager who has spent more than ten years as an IT Officer at Universiti Teknologi Malaysia. Following that, he gave a brief overview of the most common causes of project failure, such as poor planning, failure to recognise project warning signs, and a lack of communication at all levels and so on. The speaker then gave us an overview of project management. We learned in this section that there are many ways to carry out the project, one of it is the agile method. We were aware that agile methodology is a novel approach to project management. One of the examples given by the speaker was that in the agile method, feedback is given to customers after each phase, as opposed to the old school, which only gave the customer the final product at the end. Agile methodology helps in avoiding the situation where customers are dissatisfied with the final product.

In addition, we also learned about the agile scrum and scrum team. The scrum team consisted of a scrum master, a product owner, and team members. Then, the speaker

went into great detail about the agile scrum process, which gives us an idea of how project management works. Furthermore, the speaker introduced us to new development tools. The tools and applications introduced by the speaker are very useful and will help us with the project. ClickUp, GitLab, and Xd were among them. Besides, the speaker also shared his work experiences as an IT Officer, including project management in the development of UTM Smart. We have learnt a lot of good ideas for how to carry out a project as a result of this.

Before the session ended, there was a Q&A session where we could ask the speaker questions. We were able to ask some questions that were able to help us with the project, particularly teamwork. The speaker encouraged us to hold a daily stand-up meeting with the team members so that we could identify problems and difficulties that they were experiencing. The daily stand up will aid in uniting all team members in order to complete the project. As a result of this workshop, we were able to learn more about project planning and management. I hope that we will be able to complete our project successfully.

10.3 DATABASE DESIGN AND MANAGEMENT

Firstly, we are glad that we could have a great workshop with speaker, Mr Aris Bin Arifin and would like to thank him for sharing his experiences as a data administrator in UTM. In the beginning, he introduced himself and from the introduction we knew that he is an UTM and expert IT Officer who works as data admin, database admin and data engineer for 21 years in UTMdigital.

After that, he explained to us about the job scope of database administrator. The database administrator has to choose the best software and hardware for the organization’s database system to make sure the management is running smoothly and the maintenance cost is in the capability. UTM has two main database systems which are Oracle system for general and also MySQL database system for learning systems. The hardware is run on the solaris spaq architecture. Database administrators have to manage

the database infrastructure such as servers for the database to operate normally and maintain the system security to avoid the internal and external attack. Designing database schema, deciding the database backup and restore policy, designing authorization checks and validation procedures are also the job scope of a database administrator. They are required to monitor the database system daily to make sure the service is not interrupted and can be accessed by users. We just realize it is not easy for a database administrator to be in charge of many tasks in order to guarantee the users' experience.

Besides, the speaker showed us the database architecture of UTM that consists of many servers. He told us the recovery center is located at UTM Kuala Lumpur so they can switch the database if there is any disaster in UTM JB. According to Mr Aris, there are several tools for database administrators to monitor the performance of databases. For example, Oracle Enterprise Manager Cloud Control and MySQL Workbench. Moreover, we also learned about the current database sizing in UTM which is 1.5TB and the data architecture of UTM. From the architecture, we can see that there are three levels in database architecture which are data services, applications and users. Data services level which consists of operational database, data repository and flat data is used by application level that includes reporting system, websites and also operational and mobile applications while the components in application level are used by the users that involve operational internal users, top management, parliament, ministries and government agencies.

Furthermore, the speaker also mentioned the importance of database schema design to make sure there is no interruption and any major issue for the operational system. The system developers and database admin must follow the SOP to ensure good manners in the proposed application system. The system developer has to prepare the system requirement specification followed by table structure and ERD for every module. Data dictionary of all the proposed tables and ERD is needed too and it will then be evaluated by the database admin. After evaluation, the database admin needs to create the related database objects and deploy them in the development. Then, the application

testing process will be gone through by the system developer. Lastly, the database admin will deploy the production of the database and monitor the performance.

Before starting the Q&A session, we got a sneak peek from Mr Aris about the UTM data architecture. We were having more understanding about the operation of our university's database after the trip. In the Q&A session, we were provided the chance to ask a lot of questions about databases that may help us in our project. The speaker had told us some tips to avoid mistakes when developing the system. We need to study clearly about the user requirement, adhere to all the policies and prepare enough database sizing. When we face data loss due to disaster or accidently delete, we can restore the data from backup but the prerequisite is always make sure the backup runs based on policies.

In summary, we had learned much about database design and management from this workshop. We hope the knowledge we gained could help us to have a deeper understanding and apply it in the following tasks of our project.