UTM

UNIVERSITI TEKNOLOGI MALAYSIA

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SECD 2523 Database

Section 09

PHASE 1:

Project Proposal

< Pesta Tanglung UTM Management System>

<Team SKTT1>

Team Members:

1. YEO CHUN TECK A21EC0148

2. LEW CHIN HONG A21EC0044

3. NG KAI ZHENG A21EC0101

4. GAN HENG LAI A21EC0176

1.0 Introduction

This project discusses the development of a new data management system for Pesta Tanglung UTM which is a university student club that often holds the activities, especially Mooncake Festival and Cultural Night at the outdoor venue. The purpose of this project is to help the Pesta Tanglung Club to construct a new data management system that might perform more effectively than the current method processes by the committees in the club. The current processes method of PTUTM Club is found to have several weaknesses that cause some issues when the amount of data entry is growing year by year. These problems could cause inefficient workflow and unnecessary time consumption then influence the accurately stored data. Thus, the new system is required to replace the current process method. The new system development to the club will help the committees be able to smoothly control things such as automatically updating or altering the student information and prevent the duplication of data in the club database. The information synchronization will give the committee assistance in accessing the members' information and activities arrangement.

The project will investigate the issues and provide solutions in the proposal to meet the club's needs by using the system development life cycle which is a staged method to overcome their problems. One of the requirements or features that need to be included in the system is an efficient data management system with a good tracking feature. Regarding these matters, the project team looked into the problems and proposed feasibility studies in the proposal to endure them. When it came to these issues, the project team investigated the issues and provided several ideas in the plan to deal with them.

2.0 Background Study

The origins of Mooncake Festival and Cultural Night can be traced back in the year 1997, the year in which UTM Chinese Student Council was first founded. Mooncake Festival and Cultural Night (then, known as Mooncake Gathering Night) as well as Spring Festival Exhibition were the two main events of the UTM Chinese Student Council. The former was usually held at Balai Cerapan every year until its disbandment from UTM Chinese Student Council in 1997, due to several reasons within the society. It was not until the 23rd of November, 1998 that Mooncake Gathering Night was taken under the management of the Mooncake Festival and Cultural Night Club. Its name was gradually changed to Mooncake Festival and Cultural Night, signifying the drastic changes it had undergone. To date, it is the first student-organized event to take place in an open-air venue, not inside an official hall. Its attractions include a lantern parade, a gigantic floating lantern, and various theme-related venue decorations. All these assets are there to make attendees feel more attached to the Mooncake Festival spirit. Furthermore, it has been 19 years since the first Mooncake Festival and Cultural Night took place, and each festival was organized successfully every year, except for the one in 1998. Mooncake Festival and Cultural Night will not only introduce Nan Yang Chinese culture to the community, but it is also a platform for all

individuals to gather together and celebrate this traditional Chinese celebration, regardless of race and beliefs.

The above picture shows the official logo of Pesta Tanglung UTM. There are several meanings for each element in the logo. The purple colour brings the meaning of honourable and respectable. In the Chinese tradition, purple colour belongs to the royals. One prominent example is The Forbidden City (Zi Jing Cheng) in Beijing. The Moon element resembles the brightest Moon on the 15th day of the 8th month in the lunar calendar. Also used to portray the unity and cohesion among Chinese students in UTM. The City Walls resemble the unity of every member of PTUTM, an impregnable force, and the energy and determination to perpetuate Chinese culture. The last is cloud element content in the logo due to cloud and water is always in a cycle, a never-ending cycle. Depicting PTUTM will be continuous and perpetual.

3.0 Problem Statement

There are several problems that occurred in the current system of PTUTM used, The first one is manual data organization. The person in charge (PIC) of this management system needs to organize the raw data collected from the club members into different categories of relations in order to obtain any useful information from the data. These categories of relations would be determined by the demand or the requirements of the users. However, in the current system, the PIC has to enter and store every raw data into various tables which represent relations manually to allow the users to obtain the information they desired from the tables created without seeking the information from the sea of raw data. Thus, this would lead to a problem related to manual operation limitations. Since the PIC needs to enter and categorize the data one by one, thus too much time and energy would be consumed. As a result, the PIC might commit careless mistakes due to inattention such as the PIC could accidentally enter data into the wrong table or skipping a data record. This issue would become more significant when the number of data collected or the relation created rose.

The next problem is the separation and isolation of data. In the current system, different departments hold their own collection of data, which means the data is not shared among the departments even when different departments have participated in the same event or program. Therefore, we can see that a limitation on the access and control of the data arises. Moreover, since there are no overall rules about data management for every department to follow, every department will update its own regulation and this update will not be synchronised with other departments. As a result, it would cause difficulty when trying to integrate the data into a set of collections for general management due to the variation of the rules. Furthermore, this variation would produce some unnecessary procedures during the discussion about data with other departments. For instance, a department has to understand and get familiar with the data management rules of other departments. Lastly, due to the connectionless between the departments, the staff of a department may be unaware of potentially useful data held by other departments

The third problem is duplication of data. Duplication of data simply means entering the same data multiple times. The current system collects data via google forms that are created by the person in charge and filled in by the club member. Then, all the information collected will be stored and displayed in a Microsoft Excel spreadsheet. However, google form has no feature designed to identify whether the respondent has entered the same information twice or more than that. Hence, the system would treat the same data as distinct data since there is no restriction about data entering from a respondent. As a result, the same data would appear multiple times in the data storage of the current system. In addition, because the current system does not have any auto update or delete existing data function, hence the PIC needs to

check and update the spreadsheet whenever new data is recorded or delete duplicated data manually to avoid inaccuracy of results caused by data duplication. Besides, there is also another situation where a member keys in his/her data in different departments. For now, the different departments will create and spread their google form to club members for the same event. Therefore, there is a possibility that the same person fills in the same information on different google forms. Since the data collected are separated and not shared, the same data would not be merged and then will be identified as distinct data. Consequently, data storage would be wasted and the potential of getting different values or data for the same entity would be shrunk.

The fourth problem is the fixed queries or proliferation of application programs. This problem means that the operation that could be executed in the current system is limited, each program is written to fulfil a specific purpose. There is always a need for a new program when a new requirement arises. The current system could not fully satisfy the demand of the person in charge of solving a variety of tasks, such as summarising, sorting, calculation and so on. Due to this weakness, some of the processes are forced to be handled with external assistance outside the system such as external applications, manual methods, etc. Additionally, some of the programs or operations are developed to realise a specific function but the programs developed are not shared among the departments, so if a system needs a specific operation of another system, the system can only design another operation with the same logic.

Finally, the last problem would be the limitation of data operation. This problem leads to two sub-problems, the first one is the single data operation. In the current system, any operation done on the data could only be performed for a tuple at a time, meaning that the current system does not support the simultaneous operation for several tuples which have similar characteristics or criteria. As a consequence, the PIC has to repeat the same operation several times to manage several tuples, like updating information on every tuple of a collection of data. This circumstance would be expressed as the pipeline processing mode. In which the next sequences can only proceed once the previous sequences are done. Thence, the inevitability of repeated actions makes it impossible to complete the operation in a short time and the process would be delayed, subsequently, the system could not provide an instant response or reflection. Next, the second sub-problem is unresponsiveness to different conditions. The current system is unable to give different responses in different conditions, which means it could not operate differently to produce corresponding outcomes automatically based on different conditions. This situation occurred because it has no conditional operations that are responsible to identify and interpret the conditions and produce suitable results automatically. Thus, a person in charge is needed to monitor the consequences that are brought by any processes and execute suitable operations based on the situation faced. Since this is a manual process, it would rely on the experience and judgements of the PIC on the conditions encountered.

4.0 Proposed Solutions (include feasibility study)

Operational Feasibility

The new proposed system definitely will convenience the Pesta Tanglung UTM Club to manage and access control their student management system since the manual process has been minimized and replaced by automation. Since the proposed system could assist the committee in managing the student information hence no users would prevent it from becoming operationally feasible. Furthermore, there are no worries about human resource to operate since the committee of the club is a competent universities students and a fast learner who has the ability to operate the systems once it has been installed.

Technical Feasibility

In terms of technical, one personal desktop computer and monitor with Wi-Fi access are compulsory. This is because the users need the interfaces to interact with the database and Wi-Fi access to connect to the MyUTM website to do further action such as member appreciation certificate, check/key in member attendance and so on. The funds to purchase a personal desktop computer and monitor might be sponsored by i-league UTM, or else contributed by activity profit, member Fundraising, or product gains. In addition, regarding Wi-Fi access, Wi-Fi UTM will freely provide Wi-Fi- access for all the students on the UTM campus.

Economic Feasibility

Table 1: Estimated Costs and Expected Benefits for proposed system

Estimated Costs:		Expected Benefits:	
Hardware	RM3500	Product Sales	RM4000 per year
Software	RM12000	Activity Income	RM8000 per year
User Training	RM1000	Sponsor	RM3000 per year
Database Support	RM4000		
Maintenance	RM1000		

Table 2: Assumptions for the factor that Impact gain/loss

Assumptions:	
Discount rate	15%
Sensitivity factor (cost)	0.7
Sensitivity factor (benefit)	0.9
Annual increment (cost)	5%
Annual increment (benefit)	10%

Table 3: Cost-Benefit Analysis for proposed system

Criteria	YEAR									
	0		1		2		3		4	
1. Costs	Estimated	Actual	Estimated	Actual	Estimated	Actual	Estimated	Actual	Estimated	Actual
A. Development										
Hardware	3500.00	2450.00								
Software	12000.00	8400.00								
User Training	1000.00	700.00								
Total Development Cost	**16500.00**	**11550.00**								
B. Production										
Database Support			4000.00	2800.00	4200.00	2940.00	4410.00	3087.00	4630.50	3241.35
Maintenance			1000.00	700.00	1050.00	735.00	1102.50	771.75	1157.63	810.34
Annual Production Cost			**5000.00**	**3500.00**	**5250.00**	**3675.00**	**5512.50**	**3858.75**	**5788.13**	**4051.69**
Present Value (PV)			**4347.83**	**3043.48**	**3969.75**	**2778.83**	**3624.56**	**2537.19**	**3309.38**	**2316.57**
Accumulated Cost			**20847.83**	**14593.48**	**24817.58**	**17372.31**	**28442.14**	**19909.50**	**31751.52**	**22226.06**
2. Benefits										
Product Sales			4000.00	3600.00	4400.00	3960.00	4840.00	4356.00	5324.00	4791.60
Activity Income			8000.00	7200.00	8800.00	7920.00	9680.00	8712.00	10648.00	9583.20
Sponsor			3000.00	2700.00	3300.00	2970.00	3630.00	3267.00	3993.00	3593.70
Annual Benefit			**15000.00**	**13500.00**	**16500.00**	**14850.00**	**18150.00**	**16335.00**	**19965.00**	**17968.50**
Present Value (PV)			**13043.48**	**11739.13**	**12476.37**	**11228.73**	**11933.92**	**10740.53**	**11415.05**	**10273.55**
Acccumalted Benefit			**13043.48**	**11739.13**	**25519.85**	**22967.86**	**37453.77**	**33708.39**	**48868.82**	**43981.94**
Gain or Loss			**(7804.35)**	**(2854.35)**	**702.27**	**5595.56**	**9011.63**	**13798.89**	**17117.30**	**21755.88**
Profitability Index	**1.32**	**1.88**								

Solutions

In our proposed system, there are five solutions, the first one is the automatic data organization. With this solution, the person in charge (PIC) could establish different categories of relations from the raw data according to the requirements in a short instant. With this function, the raw data collected would be able to be categorized into different attributes which specify the characteristic of a tuple. The different combinations of attributes would describe different relationships. In other words, the raw data will be categorized into different attributes and represented in the desired relation. In this function, the PIC just needs to be involved in the process of determining certain attributes that will be organized into a certain relation from a set of attributes. Thus, we can conclude that this simplification of the complex and redundant manual data organization process is achieved by removing the task of manual data entry from the whole data management process. This improvement could save tons of time because the PIC does not need to perform the one-by-one tuple-checking process to inspect any data error anymore. Hence, human error could be avoided since manual checking is difficult to avoid omissions Moreover, data alternation processes like removing or adding attributes in a relation can also be implemented easier.

The next solution is the unification of data. Firstly, data collection from different departments should be unified into a single global data collection that can be shared over all departments. To achieve this solution, we proposed to store the data collected from different departments in a single location, so that the data could be accessed and controlled by every department that is involved in the same event or program. However, this solution is not just simply combining the data from different departments, the data collected would be categorized into different groups based on the events these data are involved in or the purposes of the data collected. Therefore, the PIC would have no worries that the data collected for a specific event be messed up with other data. Besides, there would be no confusion or difficulty when several PICs from different departments are assigned to be involved in one event. After the data is stored, they will be specified with their source to allow the users to have information about where the data comes from or the purpose of the data and proceed with further investigation or operations. Since the data is unified, the general rules about data management are necessary for every department to follow. These rules will be discussed and determined by all departments so that the data from different departments would be stored in the same format that can be understood by all departments. As a result, the procedure of integrating the data from different departments could be removed since the data is stored in the same location initially and all the updates or changes in data will be synchronized automatically to every department. Hence, there is no explanation among departments about the data management needed and all departments could access desired data collected by other departments. Although the data collected from different departments are unified into a single collection, the departments would still have their own authority over their own data. Meaning that they could still use their own data only for their own department's purposes or uses like viewing, updating and so on. Any operations done on their own data would not affect other departments' data in the unified data collection and any operations done on other departments' data in the unified data collection would also have no effect on their own data. Next, they also have the freedom to decide the accessibility scope of other departments, such are limited access or whole access. Thus, some of the data might be hidden from other departments and not all operations done by other departments can be executed on the data. In general, the unification of data would establish a connection between different departments while still maintaining the data security of each department.

The third solution will be focused on the maintenance of consistency and accuracy of data. Our proposed solution will be able to identify whether the information or value of the new data entry is new by referring to the records in the data collection of the system and then producing a corresponding process to that data. For instance, when there is a new data entry, the system will search through the data collection to check if the same information exists in the collection. If yes, the system will map the information to the corresponding record instead of overwriting the record with the information.

Oppositely, the system will treat this data entry as new data to be recorded. Hence, the data duplication issue can be countered and the data will always be up to date so the data storage will not be wasted. In addition, the updation of the data will not just occur in a set of data collection only. If other data collection sets contain the same record that may consist of some attributes corresponding to the information of data entry, the update would also be reflected in these records.

The fourth solution suggests that the system should have the scalability for its operations provided in order to fulfill various demands of users. The operations provided would be more sufficient and useful in supporting the users anytime for multiple processes which ranged in any difficulty level. This means that the operation should not be limited to one process only, Each operation should be executable in different processes as steps for different requirements. Hence, it would be much easier and have more space for developing a new program. If there is a new requirement, the PIC does not have to redesign the whole program, just for adding a new operation. Consequently, the users will not have the demand for external methods or assistance since the system has a complete mechanism to help them realize their desired processes. Furthermore, all the operations should be integrated into one system instead of each department having its own operations. This action allows each department to use the functions of other departments and at the same time, the same operation would not be built repeatedly.

Eventually, “Improved Data Operations with parallel implementation and responsiveness to different conditions” will be our last proposed solution. In the designed system, the operation will be improved in its implementation as well as responsiveness. We aim that the execution of operations will not be limited to a single tuple only. The PIC will have the convenience of performing the same operation on more than one tuple simultaneously, which is the parallel data operations implementation method. This enhancement allows the outcome of the response to be reflected in a shorter instant because the repeating process on several tuples has been removed. Besides, all the operations in the system should be able to be initiated automatically in response to different conditions. Simply put, the system should have the ability to detect and identify the conditions based on the predefined condition criteria and rules. Then, it will carry out suitable operations to produce an appropriate result without the monitoring of the PIC. With the responsiveness to different scenarios, the system will lead to multiple possibilities for implementation in the system and the outcomes will also be produced accurately as the expectation of the PIC. As a consequence, this accurate response will gain the trust of the users to implement the system in different conditions.

5.0 Objectives

Our goal is to create a database that will help the Pesta Tanglung UTM Club address its present problems and improve upon them.

1. To compare and contrast the limitations of the file-based system and the importance of using the database in an organization/business.
2. To learn how to identify and address problems in an existing system, and how to design and implement a new system that meets the needs of the users
3. To learn how to use database design tools and techniques, such as normalization and entity-relationship modelling, to ensure the integrity, efficiency and scalability of the database.
4. To learn how to use the system development life cycle (SDLC) to plan and execute a software development project, including conducting feasibility studies, creating a design document and testing and deploying the system.
5. To create a conceptual data model with ER modelling based on the data provided in an enterprise view.
6. To acquire skills in database design and management using Oracle SQL, including how to create tables and relationships, insert, update, and delete data, and use SELECT statements to retrieve and analyse data.
7. To gain knowledge and skills in system analysis and design as well as project management and team collaboration.

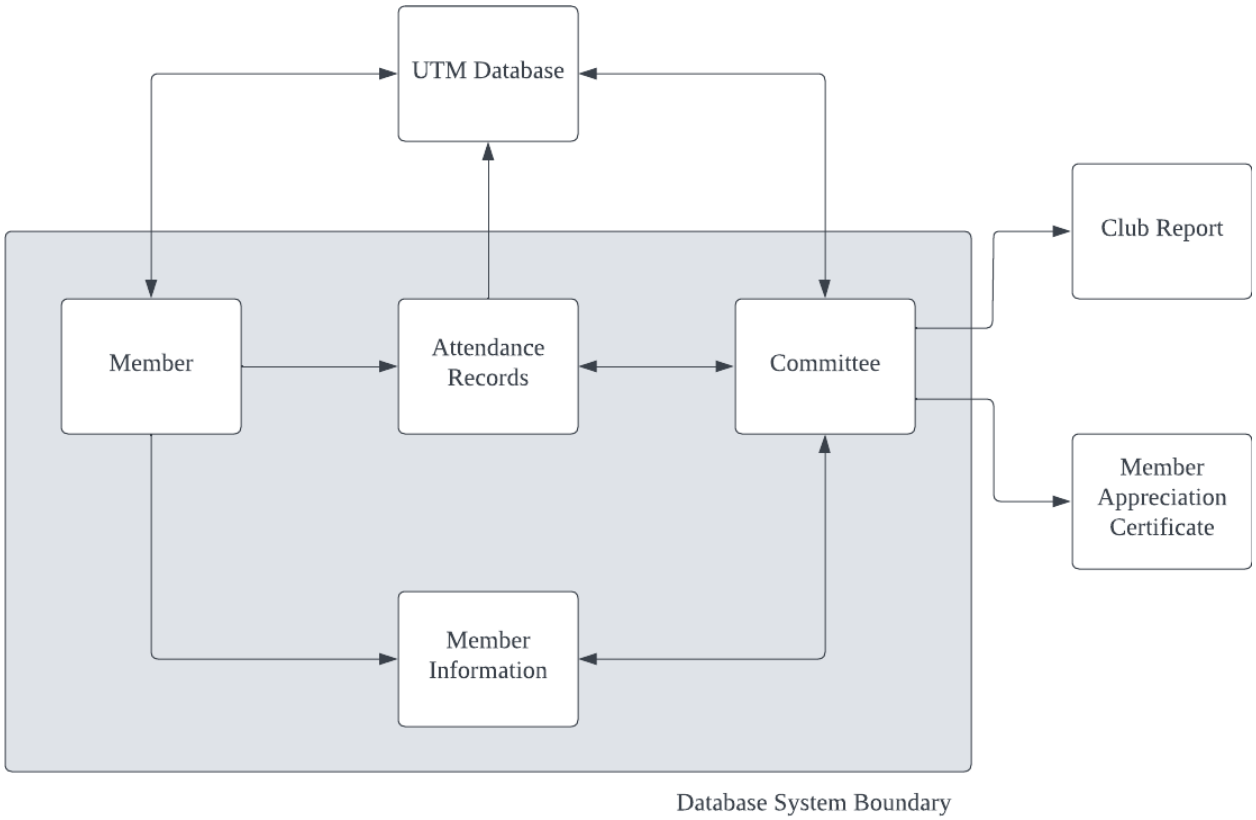
6.0 Scope

We are now planning to develop a database system that can help the Pesta Tanglung Club to simplify its student management process and enhance its current student management system. The proposed database system will easily committee on sorting categories, produce a list of systematic student information, record member attendance, etc. First-time users have to register to the system first and then log in to the system before access to the database. The project's duration is 15 weeks, which is approximately 4 months.

- **Major User View**

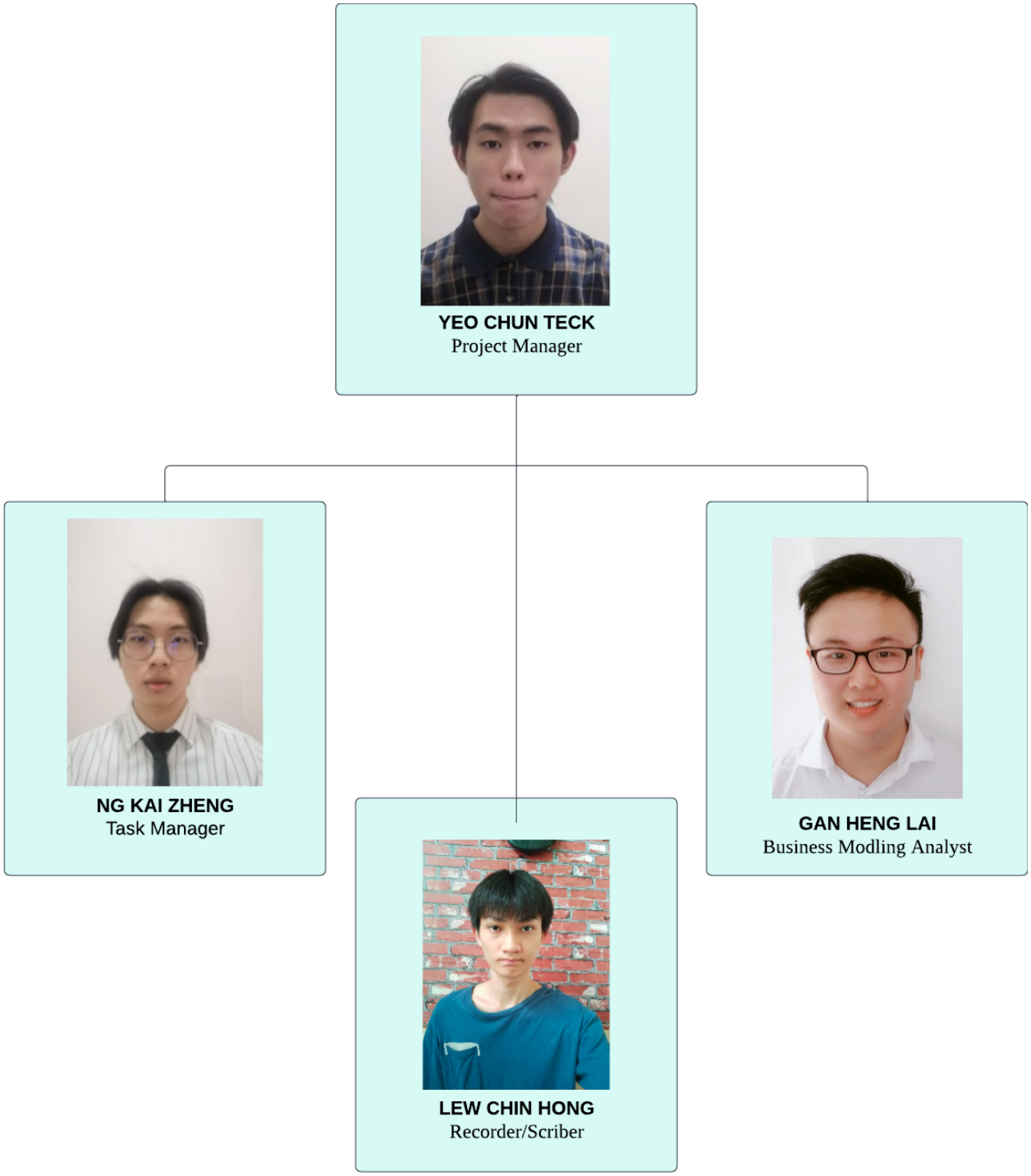
The major users of this project are the committee and members of the Pesta Tanglung UTM Club. From the perspective of the committee, an efficient and accurate system is required to ensure that data processing is error-free. For instance, in the process of recording members' information, checking and keying in attendance, members appreciate certificates, etc. From the perspective of the member, the member would not want their certificate information to be wrong and new systems could make sure to have records of their attendance. The committee have permission to add, update, delete and other modification to data on the database. However, the member of the club only has permission to view the data from the system.

6.1 Boundaries of database application

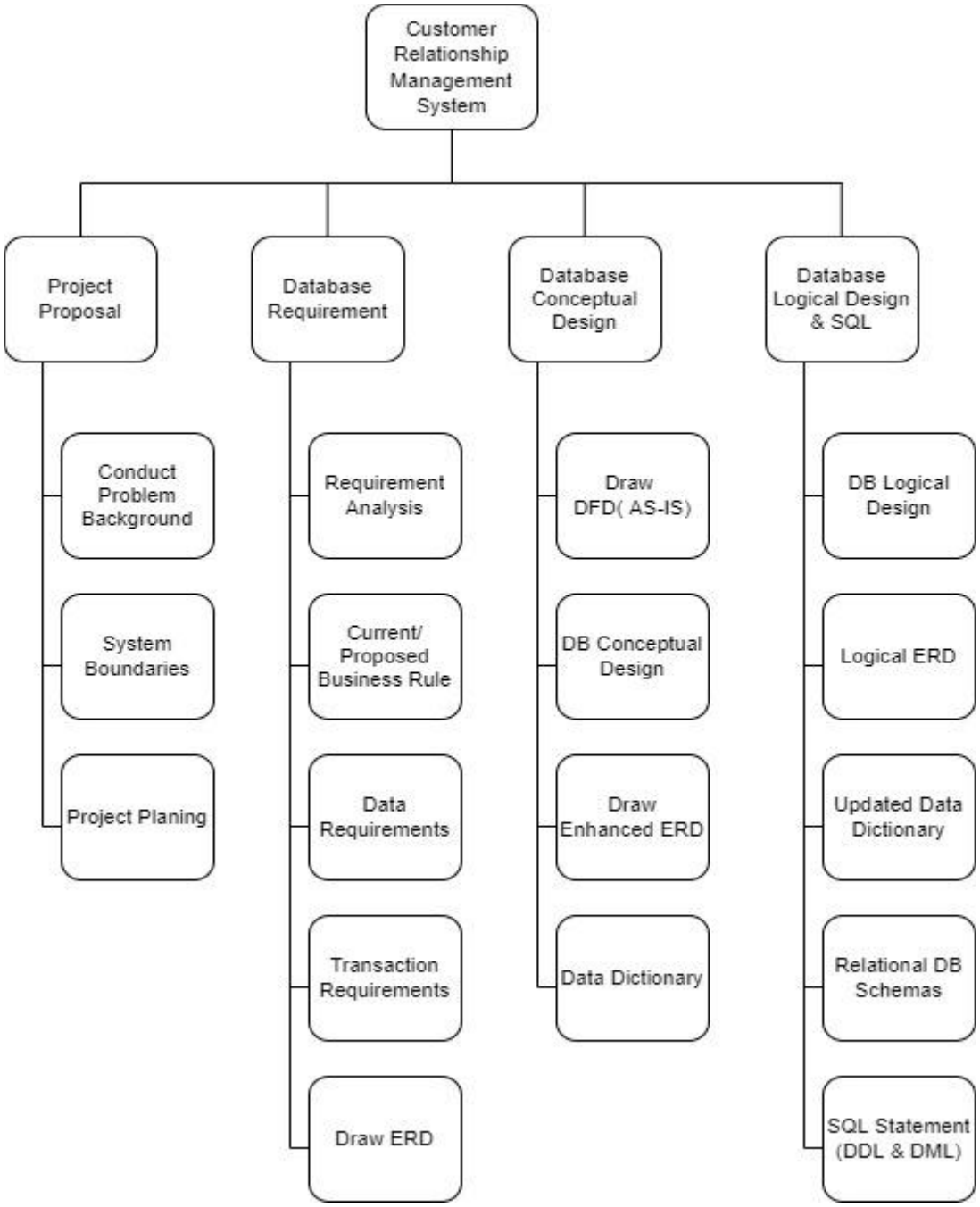


7.0 Project Planning

7.1 Human Resource

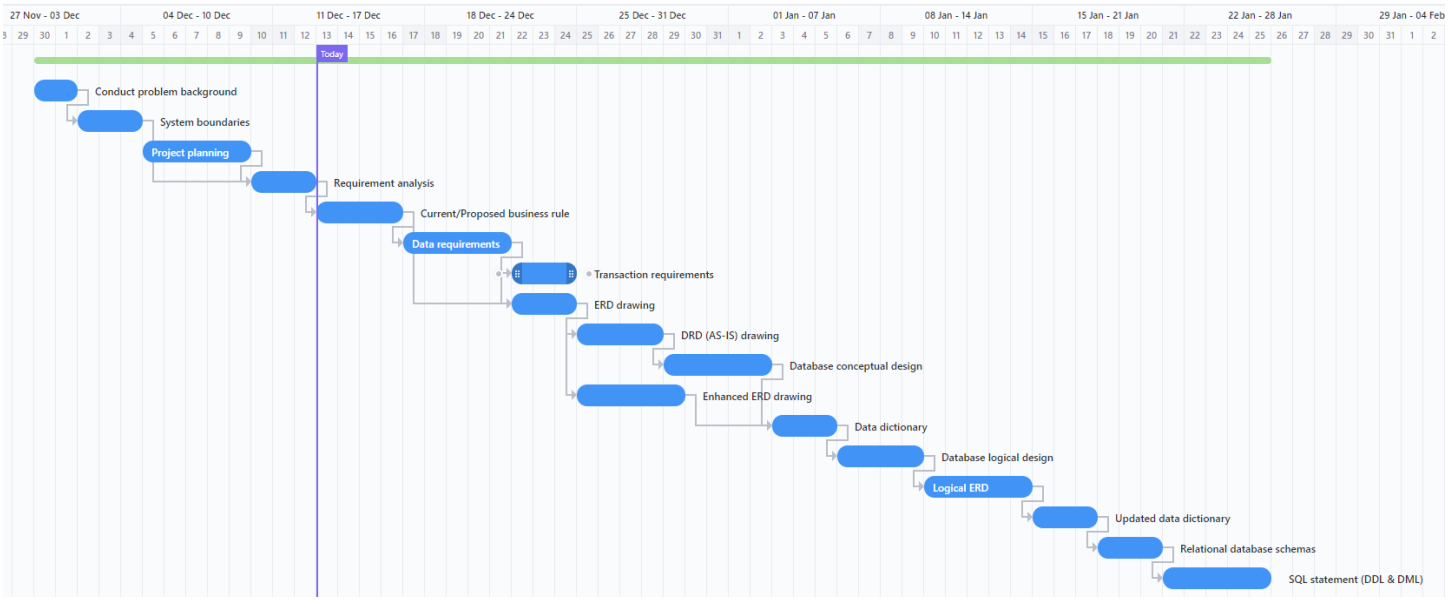


7.2 Work Breakdown Structure (WBS)



7.3 Gantt Chart

Activity	Task Name	Predecessor	Duration (Days)
A	Conduct problem background	None	2
B	System boundaries	A	3
C	Project Planning	B	5
D	Requirement Analysis	B,C	3
E	Current/Proposed Business Rule	D	4
F	Data Requirements	D	5
G	Transaction Requirements	F	3
H	ERD Drawing	E,F	3
I	DFD(AS-IS) Drawing	H	4
J	Database conceptual Design	I	5
K	Enhanced ERD Drawing	H	5
L	Data Dictionary	J,K	3
M	Database logical design	L	4
N	Logical ERD	M	5
O	Updated Data Dictionary	N	3
P	Relational Database Schemas	O	3
Q	SQL Statement (DDL & DML)	P	5



For more details, please visit:
https://sharing.clickup.com/26502109/g/h/t8ryx-188/8a05d908190800c

8.0 Benefit and Summary of Proposed System

The benefits of producing the database system compare to the current manual process are:

- To simplify the storing data process
- To sort the member information systematically
- To reduces the bugs and errors due to human mistake
- To increase the efficiency of managing and accessing data.
- To make accessing and handling data more efficient.

Our proposed student management system could help the committee of the Pesta Tanglung UTM Club to process the raw data to translate it into usable information. The raw data would be categorized into different tables which represent the desired relation followed by entering data which is corresponding to certain attributes automatically into the tables. This simplifies the complex process of manual data organization by removing the task of manual data entry from the process hence also avoiding human errors.

Furthermore, the proposed system ensures the unification of data since the database is a shared collection of logically related data. The developed system should have the ability to identify the information of the new data entry by referring to the records in the data collection of the system so as to avoid the duplication of data. Thus increasing the consistency and accuracy of data. The committee could obtain the output or response immediately right after the request to the database and could execute the same operation on multiple tuples simultaneously. The parallel implementation of the data operations would realize the shortening of the processing time for different tasks

With the new proposed database system, the committee of Pesta Tanglung UTM Club could manage their member information more easily and accurately.