UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of Computing

SECD2523-06 – DataBase

STUDENT MANAGEMENT SYSTEM

PHASE 1

PROJECT SETUP

SECTION : 06

LECTURER'S NAME : Dr. Layla Hasan

DATE : 1.11.2024

No.	Name	Metric No.
1	Moaz Adil Abdugadir Jalal	A23CS3025
2	EYAD AIMEN ELSHEIKH KHALIL	A23CS3024
3	Abdalla Ali Abdalla Ali	A23CS3022
4	Ali Isameldin Ali Abdelrhman	A23CS3001
5	Othman Hassan Othman Ali	A23CS3026

Table of Contents

1.0 Introduction:

Recently there are a lot of students enrolling in different universities every year, because of their high ranking and reputation. And from that the students expect an efficient and high level of management. The university system may use an inefficient database system or a file-based approach which will make it difficult to maintain the growing volume of students' information recorded. And this requires a new system that uses the database approach to maintain the student's information efficiently and effectively.

An effective student management system is the base of providing quality services for the different students and makes it easier for the different faculties to maintain and manipulate this information. From that the development of a new student management system will be effective, it will enhance the overall processing and retrieval of information, reduce data redundancy and the overall student registration experience.

2.0 Background Study:

The student management system is one of the biggest system (if not the biggest) in all of the universities in the world, the student management system has various department that function in a specific rhythm for each one of students, and all of these department are very related to each other, all of them have the same student information that is continuously updating.

UTM has an estimation of more than 20000 students in the main campus in Johor Bahru and more than 4500 students in Kuala Lumpur, this is including an estimation of 3000 foreign students and 9000 postgraduates.

Students management system is a system that's responsible for student enrollment in the college, also responsible for students faculty registration, student taken subjects and dropped subjects.

3.0 Problem Statement:

Student management at UTM currently is facing some challenges/problems since the current management system is unable to handle paperwork and delays efficiently, these problems include:

1. **Students face some delays in completing the registration process:**

   The waiting time for students from the beginning of their university enrollment until their

faculty registration is quite lengthy, also the waiting time between the faculty procedures and issuing the matric number is as well quite lengthy.

2. **Depending on the human workforce rather than automating the process:**

   mostly the university depends on the human workforce in terms of data collecting, entry and processing, which is delaying the sequencing processes and resulting in data loss.

3. **Accessing/Manipulating student information from the system is difficult:**

   Staff members and administrators might find it very difficult to obtain, access, retrieve or change a single piece or multiple pieces of student information from the current system.

4.0 Proposed solutions:

To solve existing problems in evaluating and utilizing student data at UTM, a database-driven Student Management System (SMS) is recommended to be implemented. This system will facilitate the ways of addressing the needs of the student, administrative staff, and faculty members by the automation of most routine tasks as well as improve the ways that data is managed within the system.

For the students, the SMS will act as an easy-to-use tool to help them complete their registration and enrollment in the faculties. It will also enable students to apply for courses, view their records, and check status of enrollment via the internet and the university platform. Through this platform they will be able to submit the updating and dropping courses and receive the confirmation online, after the request is sent the faculty members will receive it and have the options to accept it or reject it based on the student's information and the university rule. After replying to the request, the students will be notified on the university platform to do further actions.

For the administrative staff, tasks like entry of data, processing of data will be eased by the system, the system will ensure that the information required for the enrollment and registration is completed from the student side, so that the staff won't have to check the application for missing information and notify the students. The staff will notify the students about the enrolment status via email (since the students are not registered yet and don't have an account in the system). If the student is accepted the system will automatically store the student's information in the database. And based on the student information the system will generate reports automatically without involving the administrative staff members. This will eliminate delays and mistakes; it will grant staff members easy access to students' information. Some of the functional features such as report generation will assist in efficient resources management.

For faculty members, the system will allow them to display the information of all students (all this information will be retrieved from the database). This information includes names, matric number, total credits, completed courses, current semester courses, CGPA. They will also be able to review the

available courses, update them and add courses to the faculty that students of the faculty must register for. For the acceptance / rejection of the students requests the system will display the student information as stated above along with course information such as: name, code, credit hour, section, number of students in the section, and the teacher responsible for the section. After they reply to the request, for example drop course, the system will automatically update the section student number and remove the student information from the section and notify the teacher responsible for the section.

Furthermore, the proposed system will improve efficiency, cut down on waiting time, improve the current resource management, ease the work in different departments with the help of tools, and fix most of the problems that are facing the current system.

4.1 Feasibility Study

4.1.1 Economic feasibility:

Development Costs:

- Hardware Acquisition: central server, cable connections.
- Software development: DBMS, database application software, database tools.
- Staff training: scheduled training courses for staff members

Production Costs:

- System maintenance.
- Staff salaries.

-The Hardware cost for a giant database for Student Management System is calculated based on the fact the total number of operating parts of the system in UTM Johor Bahru is three with all of them operating usually together every time.

-The assumed number of UTM Johor Bahru is 2000 students enrollment, 9000 visa applicants and visa renewal, 2100 students facing issues, per year.

The assumption is made by the fact that UTM is globally ranked as the 344 best university globally according to USnews.

Cost Benefit Analysis (CBA)

Estimated cost	
Development cost	
Hardware	40000
Software Development	50000
Staff training	10000
Production cost	
System maintenance	150000 per year
Staff salaries	120000 per year

Estimated Benefits	
Increased sales revenues	(First year = 112500) + 10% every year
Reduce the operational cost	2500 per week
Reduction in Waiting Time/Productivity Gain	3000 per week

Assumptions	
discount rate	10%
annual change in production costs	5%
annual change in benefits	10%
sensitivity factor (cost)	120%
sensitivity factor (benefit)	110%

Costs	Year 0	Year 1	Year 2	Year 3
Hardware	48,000			
Software Development	60,000			
Staff training	12,000			
Total	120,000			
Production Costs				
System maintenance		18,000	18,900	19,845
Staff salaries		144,000	151,200	158,760

Annual prod. Cost		162,000	170,100	178,605
(PV)		147272.7	140579	134189
Accumulated cost		267,273	407,852	542,041
Benefits				
Increased sales revenues		123,750	148,500	178,200
Reduce the operational cost		132,000	145,200	159,720
Reduction in Waiting Time/Productivity Gain		158,400	174,240	191,664
Accumulated benefits		414,150	588,390	780,054
Gain or Loss		146,877	180,538	238,013
Profitability Index	1.98			

As our Profitability Index 1.98 is more than 1 it means that the new system is economically feasible and a good investment.

4.1.2 Technical Feasibility:

The required hardware technical resources for the new system are already available in the current system but a few adjustments would be needed for them to be compatible with the new system operations. The only required hardware that is not available in the current system is the central server and few cable connections, that's needed for the amount of incoming student traffic.

The staff with the technical skills needed to achieve the required hardware adjustments and develop the new software are available within the organization.

Thus, the project is Technically feasible.

4.1.3 Operational Feasibility:

The new system will minimize users' waiting time and reduce the uncertainty and frustration associated with the data correctness, it will also enhance the user experience in the Student Management System and make it a more reliable option. so, it will be liked and used by the users what makes it operationally feasible.

5.0 Objective:

The objective of this proposed system is to design and develop an efficient and effective system that eliminates the flaws in the current system, which will improve:

1. reducing the time for completing the registration and enrollment processes.
2. automating the routine processes such as : data entry, data collection, producing reports and data processing to prevent data loss or delay.
3. enhancing data retrieving process, for staff and administrators to obtain any kind of information with ease.

6.0. Scope:

The main purpose of this project is to design, implement and deploy an efficient Student Management System (SMS)). It will firstly eliminate concerns with regard to process flow and data management, secondly, it will be designed to satisfy concerns of primary users for better usability and performance.

Students:

The system will allow students to Submit the required documents and applications for enrollment and faculty registration online via system platform, access personal academic records, profile, courses schedules, and enrollment status. They may also be able to submit, register, drop, or modify their courses requests online, but they cannot change their faculty or modify some information, such as matric number and their CGPA.

Administrative Staff:

The administrative staff will be able to process the students' requests for enrollment and registration, change the student's private information if there is required information that needs to be changed, and display all students / staff information and notify them if there are any actions required. However, they cannot change some student's information such as the faculty related information or their CGPA.

Faculty Members:

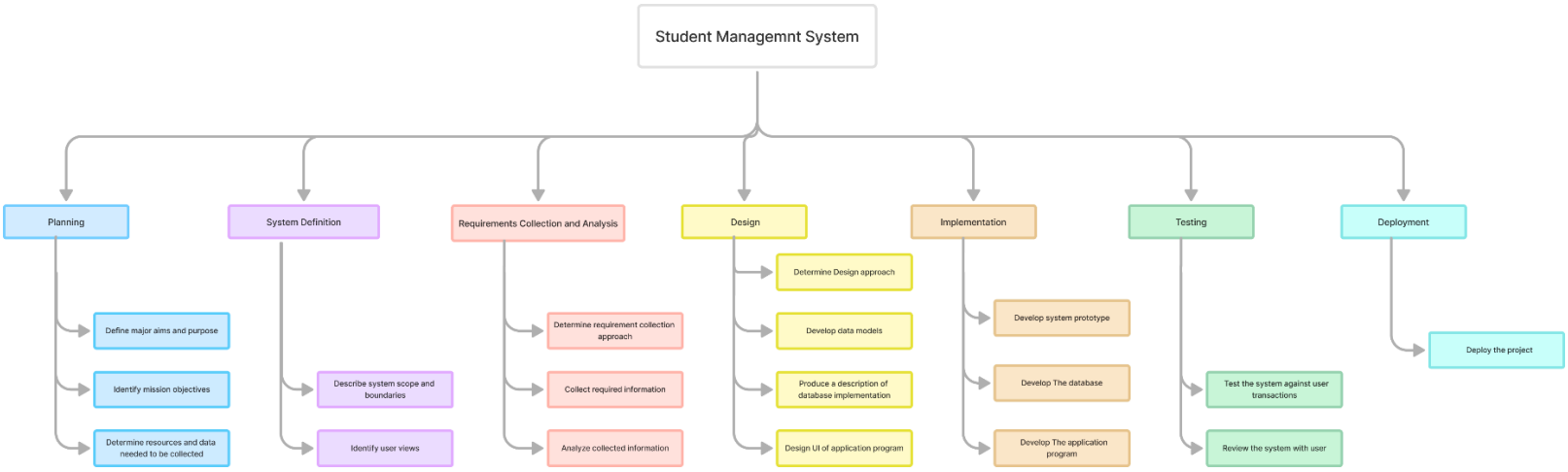
Faculty members will be able to access student data such as students records and courses, to simplify monitoring the course registration and class size and to track students overall performance. They are also able to accept or reject the students' courses related requests.

7.0. Project Planning:

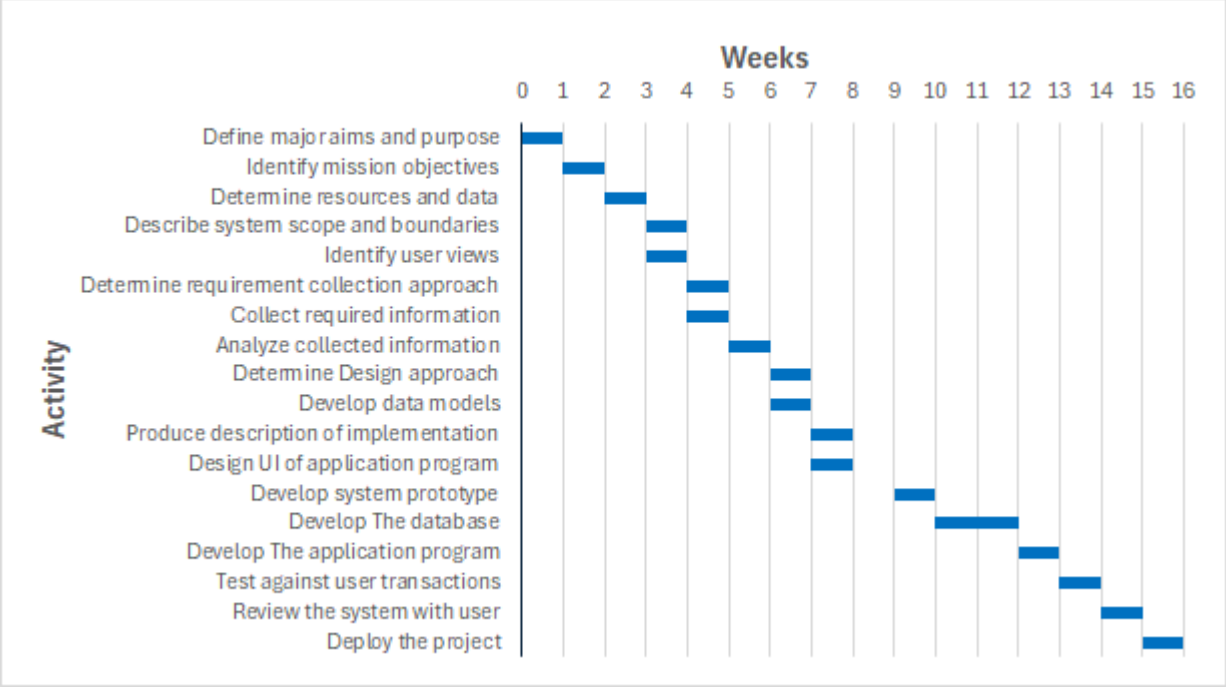
7.1 Human Resources:

- **Project Manager:** Responsible for overall project oversight, coordination, and stakeholder management. (Abdalla Ali)
- **System Analyst:** Responsible for analyzing the current system and determining the weak points and improvement opportunities (Ali Isameldin)
- **Data Administrator:** Plan the database and determine the standards and policies. (Abdalla Ali)
- **Database Administrator:** Create and implement the physical design, security and integrity control. (Moaz Jalal)
- **Database Designer:** Create the logical and physical design of the database. (Moaz Jalal)
- **UI/UX Designers:** Design intuitive and user-friendly interfaces for the application program. (Othman Hassan)
- **Software Developers:** Tasked with the development and implementation of the Application program. (Eyad Aimen, Othman Hassan)
- **Quality Assurance/Testers:** Conduct rigorous testing protocols to ensure the reliability, functionality, and performance of the implemented system. (Othman Hassan, Ali Isameldin)

7.2 Work Breakdown Structure (WBS):



7.3 Gantt Chart:



8.0 Requirement Analysis:

8.1 Current business process (scenarios, workflow):

Student:

1. University Enrollment:

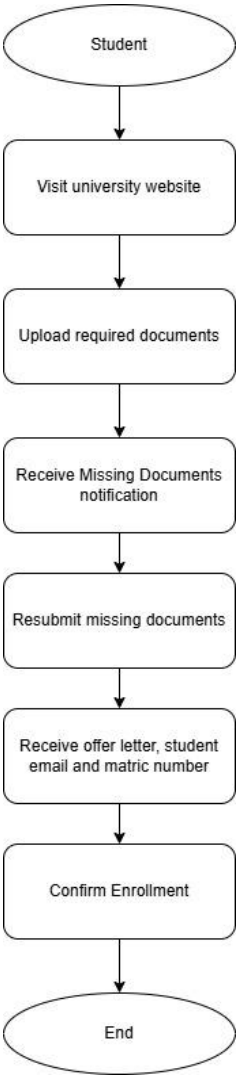


Diagram 8.1.1: Student enrollment in university process

In this process The student submits his application by uploading them through The university website, Following that UTM's office receives and reviews the documents,After getting approved, an offer letter, student and email gets sent to the student to confirm the enrollment process.

2. Course Registration

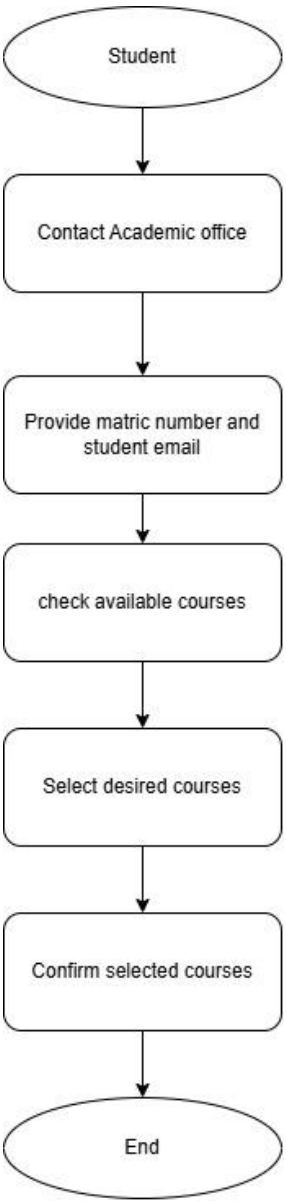


Diagram 8.1.2: Student Course Registration process

Upon enrolling in the university The next step for the student becomes clear which is course registration. This process starts with visiting the academic office to check for the available courses choosing the subjects he wants to administer. Following this flow the student receives a confirmation letter from the academic office to confirm the course registration.

3. Dropping Courses:

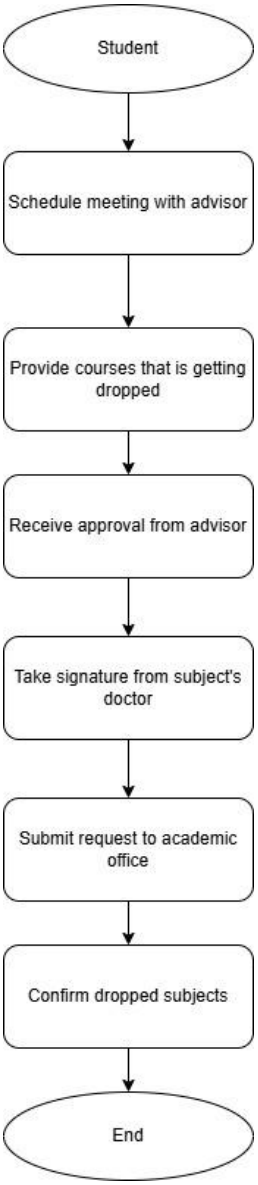


Diagram 8.1.3: Student Dropping courses Process

Sometimes some minor inconveniences happen for the student which results in this specific process, before submitting the drop request, Firstly the student must schedule a meeting with the academic advisor to provide the courses which are getting dropped, the student takes the approval from the advisor and then proceeds to take signature from the subject’s doctor, after all this steps the student submits the request to the academic office who proceed to confirm the dropping request.

Administrative Staff:

1. Student Enrollment:

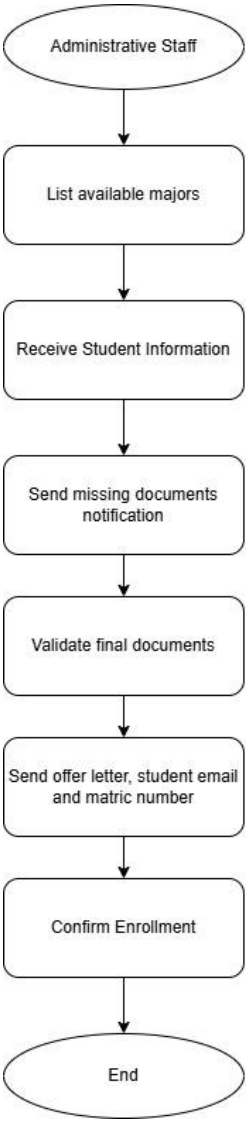


Diagram 8.1.4 Enrolling student in university Process

This Process Initiates by Listing the available majors in the university website, After that the student uploads the required documents listed by the university administers. The documents get checked and reviewed which leads to notifying the student about the missing documents he didn't upload, Following that the student reuploads the documents and the university immediately sends the offer letter, student email and matric number to confirm the enrollment.

Faculty Members:

1-Student Registration:

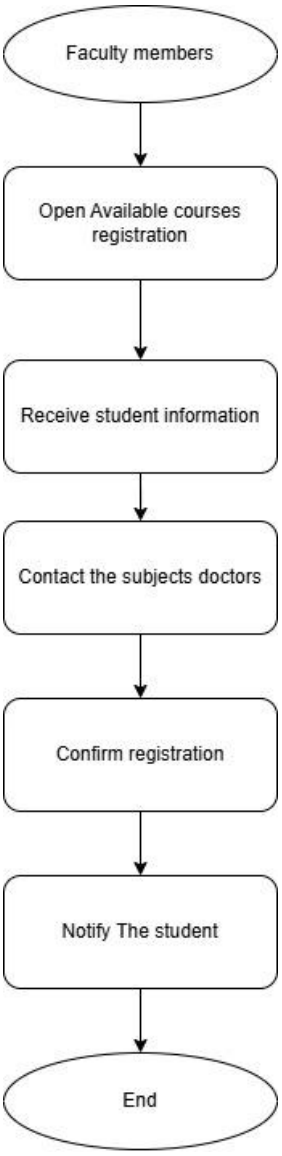


Diagram 8.1.5 Registering Students in courses Process

The student registration process starts with Listing the available courses for the student to choose from, Then the student sends his info for the members. Following this flow the faculty members contacts the subjects doctor to check if the course is still available, if the course is still available the members will confirm the registration and notify the student immediately.

2-Update course information:

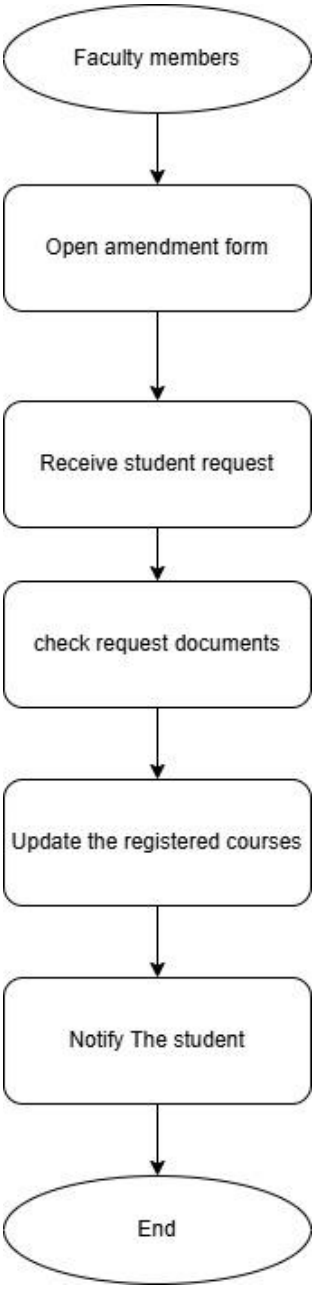


Diagram 8.1.6 Updating Students courses Process

The course Updating workflow begins with faculty members accessing the amendment form system. Upon receiving student requests, faculty members review and verify all submitted documentation. Once verified, they update the registered courses in the system according to the requested changes. Finally, faculty members notify students about the status of their amendment request, completing the process.

9.0 Transaction requirement (data entry, data update/delete, data queries):

9.1 Data entry:

1. Students enter the required information for enrollment, such as name, passport number, phone number, email, academic certificate, and faculty that the student wishes to enroll for.
2. Staff members enter their identification information, such as name or identification number and password in order to see the various student requests and approve it / deny it and add course information such as, course name, course code and credit hours that the students can register to.
3. Students select the courses from a list of courses they can register to submit the registration request.
4. Students enter their identification information, such as name or matric number and password to access their academic records and submit the various requests.

9.2 Data update/delete:

1. Staff can update/delete student records.
2. Staff can update/delete courses based on students' requests.
3. The system will Update/delete the available courses.

9.3 Data queries:

1. Display students' information.
2. Display student registered courses.
3. Display students' faculty enrollment requests.
4. Display student academic records.
5. Display students' course registration requests.
6. Display students' amendment requests.
7. Display students drop course requests.
8. Display course information.

10.0 Benefit and summary of the proposed system:

The proposed system will automate some of the processes which will reduce the data entry processes, improve the efficiency of the system, and reduce costs. For example, when issuing the offer letter the system will automatically produce the document after the university approval (no need to

re-enter the data again). Also the system can update the student academic records after the end of each semester without the need to re-enter the student grades and do the calculation manually.

The benefits for the students are: ease of enrollment for the university, ease of accessing their academic information and ease of submitting any request regarding the courses.

The benefits for the staff members are: ease of access to the student requests, manage the students requests faster, reduce data entry operations and errors and provide the digital records for the students and there is no need for physical files.

11.0 Summary:

The proposed system is a general Student Management System in UTM or major worldwide universities, that faces several problems mainly delay and loss of data, due to the large number of applicants both locally and globally (almost 10000 students annually), these problems can generate larger issues within the same system or in other related systems, Each of these major problems are considered to be an opportunity to enhance the current system to speed up its processes, fix its current issues and provide better user experience.

the objective of this proposed is as mentioned before enhancement and there is a given proposed solution for achieving it, The proposed solution as all of the solution will require a feasibility to make sure the system is beneficial, the feasibility shall include the technical, operational and financial feasibility to cover the cost of all parts and aspect of the system, when the system was determined to beneficial the project planning is the next phase, where the human resources are to be assigned in the most suitable position, The project should be broken down into small parts to be assigned to the human resource individuals, using top-down approach and displaying the project parts and the needed activities using Work Breakdown Structure(WBS) chart, The time span of the project is to be estimated using Pert and Gantt charts.

The final step is the requirement analysis which focuses on studying the current system (as-is system) workflow and process, and the study of the transaction processes including data entry, data change (update/delete) and data queries to see if it meets the user needs in the current system, a

summary of the benefits of the proposed system shall be given to abstract the perks in fewer sentences, and general summary of the whole report to give a general idea about the work that will be and had been done.