PROJECT: PHASE 2

SECD2613 SYSTEM ANALYSIS AND DESIGN

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SECTION: 07

LECTURER'S NAME: ROZILAWATI BINTI DOLLAH @ MD. ZAIN

STUDENTS' DETAILS:

NUR AYUNI BINTI NOOR AZMAN	A23CS0257
FARAH NABILA BINTI WAN ISMAIL	A23CS0077
ANISA CHOWDHURY	A23CS0288
AINNUR ASHIKIN BINITI ASDAR	A23CS0208

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1. OVERVIEW

In the dynamic and evolving landscape of higher education, universities play a pivotal role in cultivating future professionals and leaders. As these institutions grow and diversify, the complexity of managing campus resources—ranging from academic services to administrative functions—increases significantly. The need for an integrated approach to manage these resources efficiently has never been more critical.

The proposed Campus Resource Management System (CRMS) aims to solve these challenges by implementing a comprehensive solution that uses technology innovation to streamline operations, enhance collaboration, and improve overall campus efficiency. The goal of the Campus Resource Management System (CRMS) is to transform the traditional campus environment into a more accessible, organised, and user-friendly environment for staff, teachers, and students by utilising cutting-edge technologies.

As we all know, campus or university is like a factory that produces its own product which is the students. Campus plays an important part in ensuring the future of a country by producing young talents and future leaders. Moreover, campus or universities are the centre for research, education and innovation. Thus, it plays a very crucial part in addressing the future of the country. Hence, to achieve this, surely, the management of the campus must also be on top of the world.

Throughout the advancement of technology, we could say that all the campuses have already implemented their own campus resource management system to manage the resources in the campus systematically. Even so, since the number of students and staff could always increase every year, they will still face many challenges in managing student records, faculty data, facilities, and finances without an efficient campus resource management system. Then, without efficient management, the quality of education, student performance and overall campus performance could also be impacted. Therefore, developing an effective Campus Resources Management System is very crucial in order to manage the data of the campus efficiently. So, the campus resources can be managed excellently to produce the best product for the future of this country.

2. PROBLEM STATEMENT

One of the biggest challenges facing modern universities is effectively managing the variety of resources available on campus. Universities frequently experience inefficiencies of resource management since there is no centralised system in place. The absence of a centralised platform causes university's unorganised management, which makes it more difficult to schedule events, provide facilities, and organise the activities of staff, faculty, and students.

To overcome these challenges, the Campus Resource Management System (CRMS) must develop a variety of features that allow users to efficiently manage the resources of the campus, which will improve effectiveness, and collaboration throughout the entire university.

Thus, the primary objective of this project is to create an effective CRMS that addresses the management problem that universities experience by improving resource use and implementing strategic plans and actions in organising activities for staff, faculty, and students.

3. PROPOSED SOLUTION

3.1 Technical feasibility:

The Campus Resource Management System (CRMS) will have a centralised database to efficiently store campus data, ensuring an efficient storage and retrieval of data. It will use secure authentication mechanisms and role-based permissions to restrict data access with high security in order to protect students' and staffs' information. The CRMS will allow reservations of facilities in which students will be able to view availability and book any campus facility, while the administrators will be able to keep a track record of the reservations. Event organisers can create, schedule, and manage campus events, workshops, seminars, and extracurricular activities, which include event registration, promotion, attendee management, and feedback collection. Administrators can manage student enrolment, course registration, academic records, and student activities, while students can access their academic profiles, register for courses, view schedules, and track their progress. Lastly, HR administrators can manage faculty and staff information, including recruitment, scheduling, performance evaluation, and leave management. Faculty members can also access teaching schedules, submit grades, and communicate with students via the CMRS system.

3.2 Operational feasibility:

Operational feasibility will be developed with user-friendly design, thorough guides, and continuous maintenance. The CRMS will have a straightforward user interface in order to ensure easy access to the system. Training sessions and user guides will be provided to familiarise users with the system features. The CMRS will be customised to meet the specifications needed by the university with continuous feedback systems to ensure and improve the performance of the CMRS.

3.3 Economic feasibility:

Economic feasibility will be determined using cost-benefit analysis and ROI estimations. The CRMS will optimise resource usage and reduce the need for manual management which will decrease the costs for staff and increase efficiency. A budget plan will detail the initial development cost, maintenance fees, and possible future upgrades.

4. INFORMATION GATHERING

To understand the AS-IS system as much as possible, information gathering is crucial. Based on the AS-IS system, we obtained this data from KTDI management, a stakeholder of our project, and the 15 respondents who are part of the KTDI community.

4.1 METHOD USED

We used an interview and a questionnaire with both closed- and open-ended design questions to gather further information about the AS-IS system. The survey is administered online using Google Forms. The interview notes, the questions, and the responses from 15 respondents are presented here.

4.1.1 QUESTIONNAIRES

Question 1: What is your position ? (close-ended)

Position

15 responses
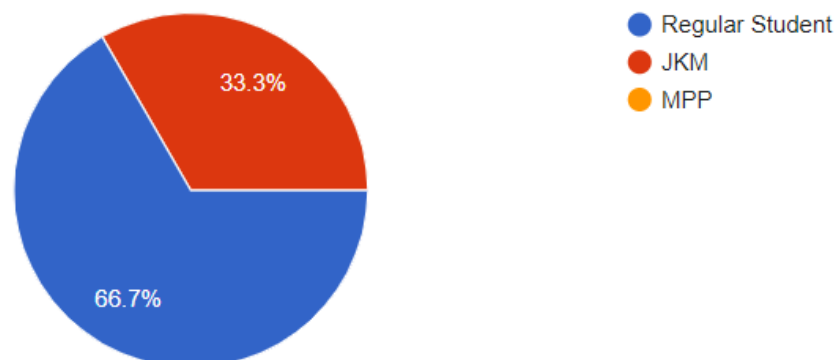
According to the responses to the questionnaire, two thirds of the total respondents are regular students of KTDI. And rest of the students are JKM students, and none of the responders were MPP students.

Question 2: What is your opinion on facility booking and management such as Dewan Resak in KTDI in terms of convenience and efficiency? (Open-ended)

What is your opinion on facility booking and management such as Dewan Resak in KTDI in term of convenience and efficiency?

15 responses

good

Process takes very long

inconvenient

it's okay

Good

It is so efficient because we have to book the hall early to make it easy for the staff to manage it

basic one because we need to fill in the form to book

I have never booked a facility

convenient

For me, facility booking and management in KTDI are still okay and better than other colleges

good

Imo thats fine for now

It's okay

I believe that it is very good actually.

It ok

In terms of efficiency and convenience, 13 out of 15 respondents believe that KTDI's facility booking and management, such as Dewan Resak, is good to alright. Few of them added that the booking process is so simple that one needs to fill in a form only to book the hall. According to one reply, KTDI offers superior facility booking and management services compared to other kolejs in UTM. Though 2 of them complained that their services are time-consuming and inconvenient.

Question 3: Have you ever faced any problems regarding communication with KTDI staff during the process of booking facilities in KTDI? (if yes, what is it?)

Have you ever faced any problems regarding communication with KTDI staffs during the process of booking facilities in KTDI? (if yes, what is it?)
15 responses
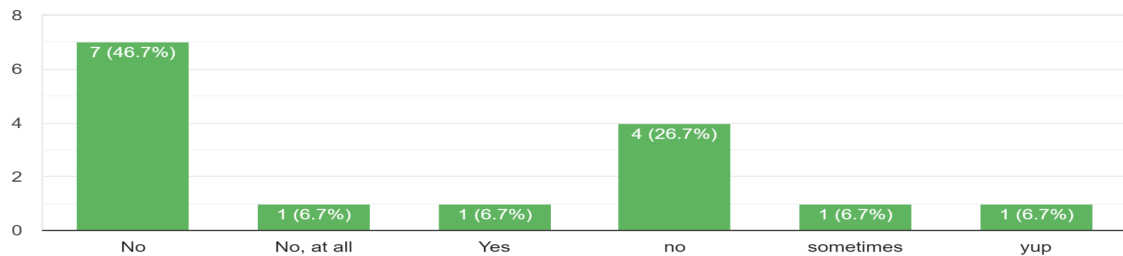
12 out of 15 respondents or 60.1% said they have never had any issues communicating with KTDI employees when making a reservation for facilities. Merely 13.4% of the respondents (2 respondents) reported encountering issues, and 1 respondent reported occasionally having trouble communicating with KTDI employees while making reservations for facilities.

Question 4: Have you ever organised an event in KTDI?

Have you ever organized any event in KTDI?
15 responses
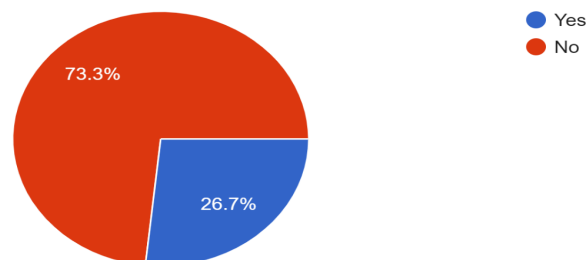
Majority of our respondents, 11 out of 15 (73.3%), have organised an event in KTDI which indicates that they responded from their personal experience.Though only 26.7% (4 respondents) never organised any event in KTDI.

Question 5: If yes, is it easy to apply to organise an event?

If yes, is it easy to apply to organize an event?
9 responses
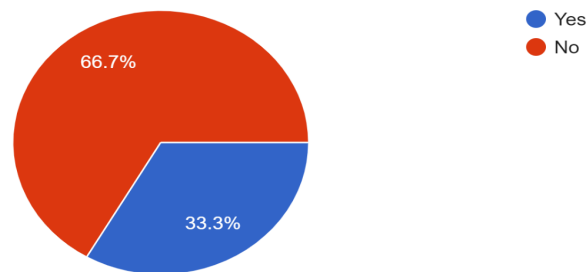
Among the respondents who have ever organised an event in KTDI, 66.7% (6 respondents) replied that they think that it is easy to apply to organise an event. But 33.3% (3 respondents) don't agree that the application process for an event is not easy at all.

Question 6: How do you get information regarding latest news and events at KTDI?

How do you get information regarding latest news and events at KTDI?
15 responses
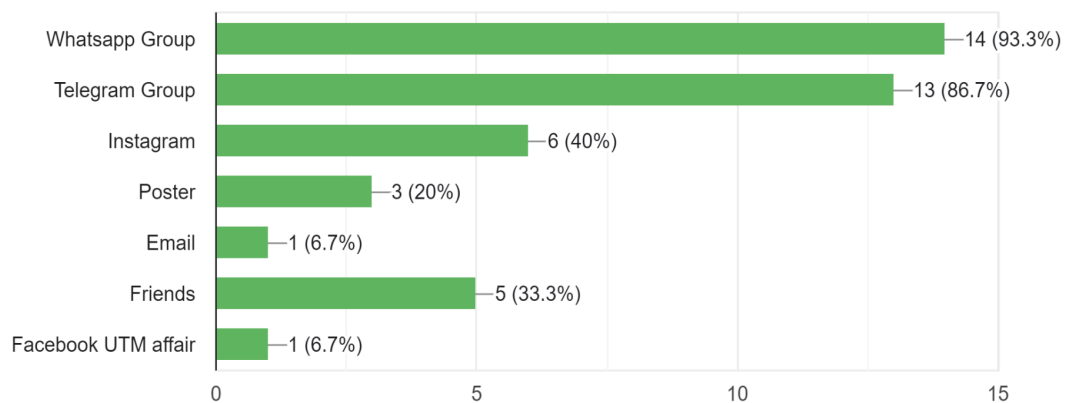
Most of the respondents get information regarding the latest news and events from social media, from whatsapp (14 respondents), telegram (13 respondents), instagram (6 respondents) and facebook (1 respondents). A good number of respondents (33.3%) know from their friends and a little number of students know from posters(3 respondents) and email (1 respondent).

Question 7: Has there been times where you've overlooked important information regarding the event and latest news in KTDI?

Has there been times where you've overlooked important information regarding the event and latest news in KTDI?
15 responses
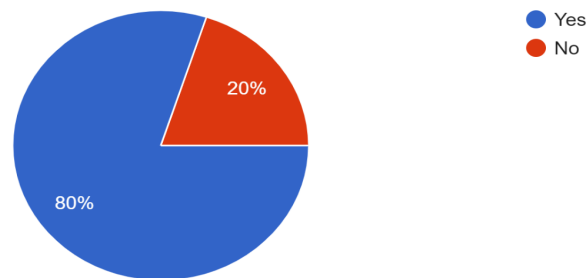
To measure how effectively KTDI promotes its events, we asked our respondents this question. 80% of the respondents (12 respondents) answered that they have overlooked important information regarding the event and latest news in KTDI and the rest of them (3 respondents) never overlooked any information.

Question 8: Do you think the facilities provided by KTDI are enough to meet the needs of the students?

Do you think the facilities provided by KTDI are enough to meet the needs of the students?
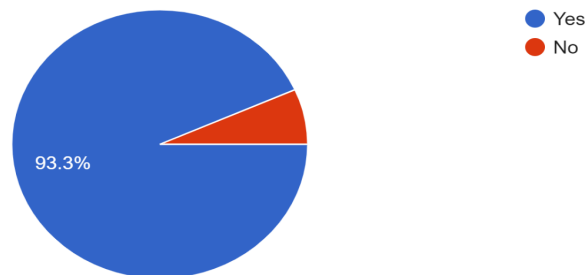15 responses
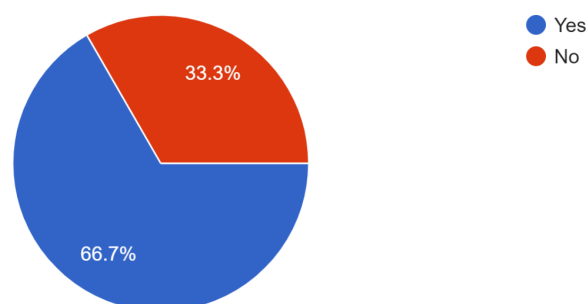
Two thirds of respondents (10 respondents) believe that facilities provided by KTDI are enough to meet the needs of the students. The remaining one thirds (5 respondents) don't agree that KTDI provides enough facilities to meet their needs.

Question 9: Does the KTDI management take student's feedback seriously to improve themselves?

Does the KTDI management take student's feedback seriously to improve themselves?
15 responses

It is quite impressive that 14 out of 15 respondents believe that KTDI management takes student's feedback seriously to improve their facilities. Though only 1 respondent thinks that student's feedback is not taken seriously.

4.1.2 INTERVIEW

Module	Interview questions	
Introduction	**Interviewer**	Good afternoon, Puan Rosnani. My name is Ainnur Ashikin, UTM student. My group members and I are first-year students from School of Computing, and we were currently doing a group project for the Campus Resource Management System which has the objectives of analysing problems and proposing solutions to develop an improved current system. Thus, we have chosen college tun dr. ismail management system as our case study and we have some questions for you. But first, can you introduce yourself first?
	Interviewee	Thank you Ainnur Ashikin. I am Rosnani Binti

		Katib. I work as an administrative assistant at Kolej Tun Dr. Ismail (KTDI) . I have served in Universiti Teknologi Malaysia (UTM) for around 20 years. Before this, I have worked in Kolej Tun Hussien Onn (KTHO), Kolej Dato Onn Jaafar (KDOJ) and now I am working in KTDI.
Facility Booking and Management	**Interviewer**	Can you explain the workflow on how to book the facility In KTDI such as Dewan Resak?
	Interviewee	Students that want to book any facility in KTDI, they need to fill up the form, three working days at the latest before the date of use. Students must submit the form and the attached letter of programme approval. After that, the process of approving or disapproving is handled by the college.
	Interviewer	What kind of information is needed in order to book a facility?
	Interviewee	Usually we will ask for the date when the facility is to be used and what room to reserve.
	Interviewer	Who is involved during booking processes? (student, felo, staff, etc)
	Interviewee	This applicant's application will be approved by the assistant administrative officer.
	Interviewer	What kind of storage do you use to keep track of all bookings? (on computer, manual storage, etc)
	Interviewee	As of right now, we use manual files to store all information.
Event	**Interviewer**	Can anyone organise an event in KTDI or only an

Management		organisation from UTM.
	Interviewee	In KTDI, only organisations from UTM can organise events.
	Interviewer	Do you have a certain way to record every event held in KTDI so it doesn't clash with each other and how?
	Interviewee	For now we record manually on the calendar or we record on the notice board
	Interviewer	Is there anything that we can improve in event management so it is easier for the management team to manage?
	Interviewee	We could propose creating a Google Form or any other application, which would allow us to ask the student to complete the form directly. This way, the student would know right away what document needs to be brought, how much money needs to be ready, and what is their application status. There is no need to do follow up anymore.
Student Management	**Interviewer**	Do you require any physical papers for student records or everything is digitalised?
	Interviewee	For students' records, everything is kept by UTM in AIMS 2000 and the campus management office can only access students' records there. (Digitalised)
	Interviewer	Do you use any specific software to manage the student records? If yes, what are they?
	Interviewee	AIMS 2000

	Interviewer	How do you manage confidential information related to students?
	Interviewee	Only authorised personnel, usually the higher ups in campus management offices like administrative assistants, have access to the student's record.
Communication and Notification System	**Interviewer**	How do you deliver news to everyone about current events happening in KTDI?
	Interviewee	We use WhatsApp, Telegram, and posters to spread our news or events.
	Interviewer	Is there a specific platform that the management team uses to communicate with each other to ensure that everyone in the management team is notified about the current event?
	Interviewee	We use WhatsApp instead of other messaging apps because employees can overlook important information because they get so many spam emails.
	Interviewer	Is there any deficit in the platform used?
	Interviewee	We worry that if someone has too many groups, they might overlook something important.

4.1.3 STROBE

1) **OFFICE LOCATION**

The office room of the Assistant Administrative Officer is placed at the back of the department, facing directly towards the counter where students and staff can be seen from the office room. This shows that the AAO is an observant individual, emphasising harmonious work culture and works towards feedback of students.

2) **DESK PLACEMENT**

The desk of assistant administrative officer was strategically placed to maximise the STROBE effect, ensuring it remained unobtrusive while enhancing the observational capabilities of the research method.

3) **STATIONARY EQUIPMENT**

The assistant administrative officer prefers to collect and preserve data from numerous sources. The storage space is just the right amount of size.

4) **PROP**

The Assistant Administrative Officer's desk is neat and tidy, with all important files, devices and stationaries placed where it is easily retrieved. This shows that the AAO is organised and disciplined.
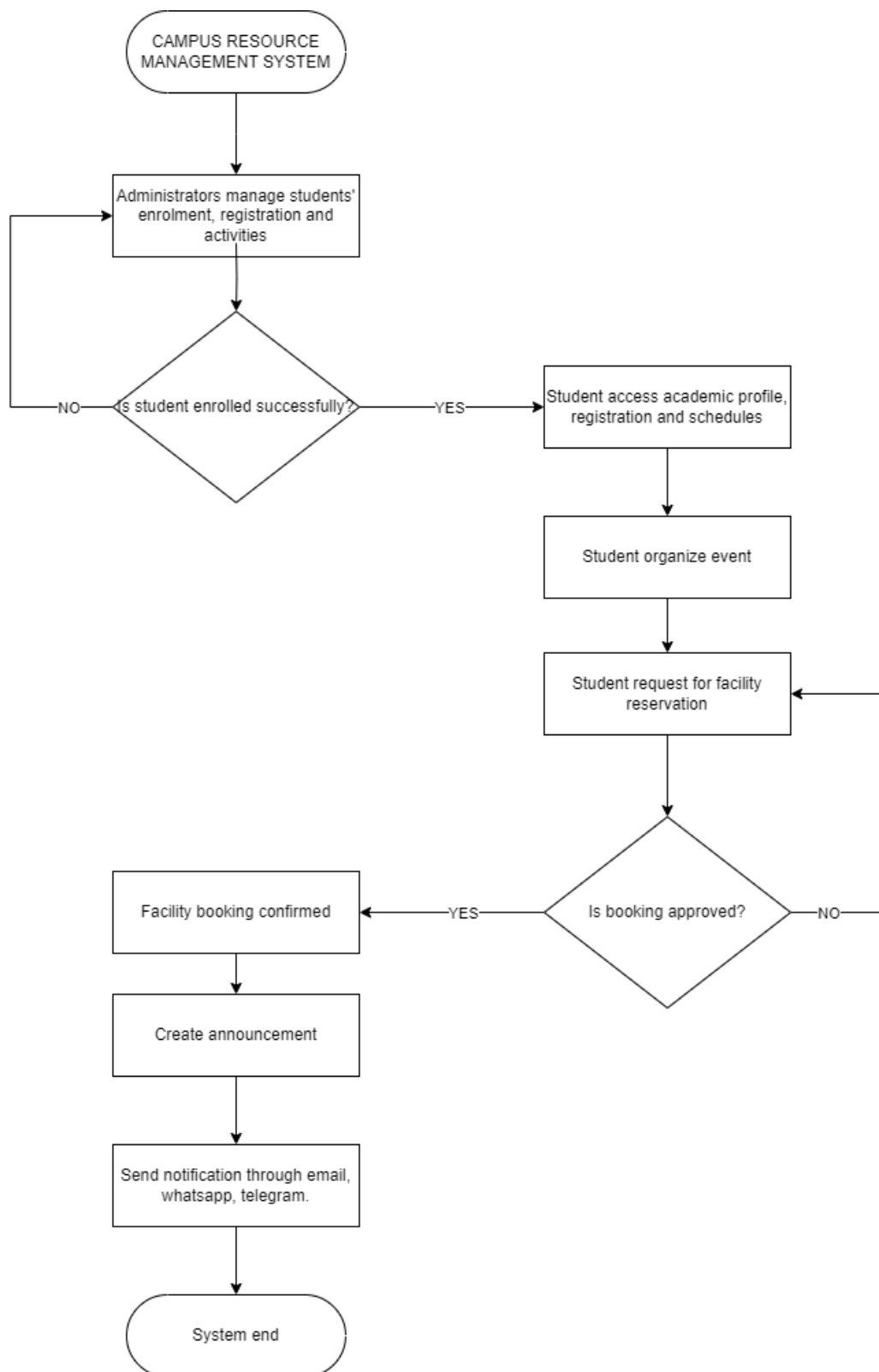
5) **CLOTHING**

The Assistant Administrative Officer of KTDI often wears semi-formal attire, showing that the AAO is neither strict nor extremely outgoing. It can be concluded that the AAO is someone that follows the rule, but is also easy to talk and discuss with.

4.2   SUMMARY OF INFORMATION GATHERING

Through these methods, we were able to gather much information about the system flow in the management of campus resources in KTDI. During the interview, we were able to identify which part of the system needs to be improved and which is very crucial to increase the efficiency of the system. The most important point that we were able to highlight here is that even though they also use a digitalized system for student management, however, for facility and event booking, the management still used the manual method which is booking through paperwork. Even though these methods have their benefit, there are still some deficits which have been highlighted by our interviewee which is the manual paperwork is not very convenient as the person who wants to book the facility or organise an event need to come to the office in person to give the booking details and also has to come again after the paperwork has been approved. Apart from that, in terms of student management, every data about the students is kept in digital form which can be accessed by authorised personnel only in AIMS 2000. Then, through the unobtrusive method that we used, which is observation or STROBE, we were able to understand our stakeholder view and personality about the current resources management system in Tun Dr. Ismail College which allows us to provide the most suitable and efficient approach in order to increase the system efficiency and suit with what our stakeholder wants in the system.

5. REQUIREMENT ANALYSIS

5.1 Workflow and Scenario

5.2 Functional Requirement

| Functional Requirement	Description
Student Management	● Administrators can manage student enrolment, course registration, academic records, and student activities. ● Students can access their academic profiles, register for courses, view schedules, and track progress.
Event Management	● Event organisers can create, schedule, and manage campus events, workshops, seminars, and extracurricular activities. ● Features include event registration, promotion, attendee management, and feedback collection.
Facility Booking and Management	● Users can search, view availability, and book campus facilities such as classrooms, auditoriums, labs, and sports fields. ● Facility managers can define booking policies, manage reservations, and track resource utilisation.
Communication and Announcement	● The system facilitates communication among stakeholders through email, messaging, and notifications. ● Users receive announcements, reminders, and alerts regarding upcoming events, bookings, and deadlines.

5.3 Non-Functional Requirement

| Non-Functional Requirements	Description
Security	● System should be able to prevent leakage of confidential information.
Usability	● User interface should be easy to understand and use.
Performance	● System should be able to handle hundreds of users at the same time.
Reliability	● Systems should be accurate in storing and managing data.

5.4 Logical DFD AS-IS System
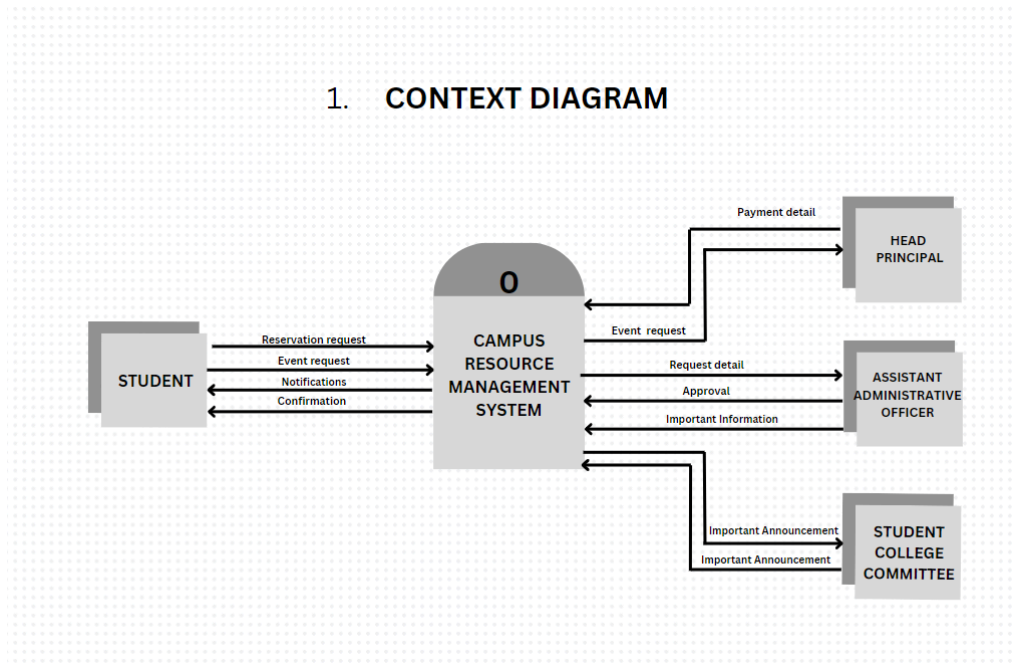
5.4.1 Context Diagram
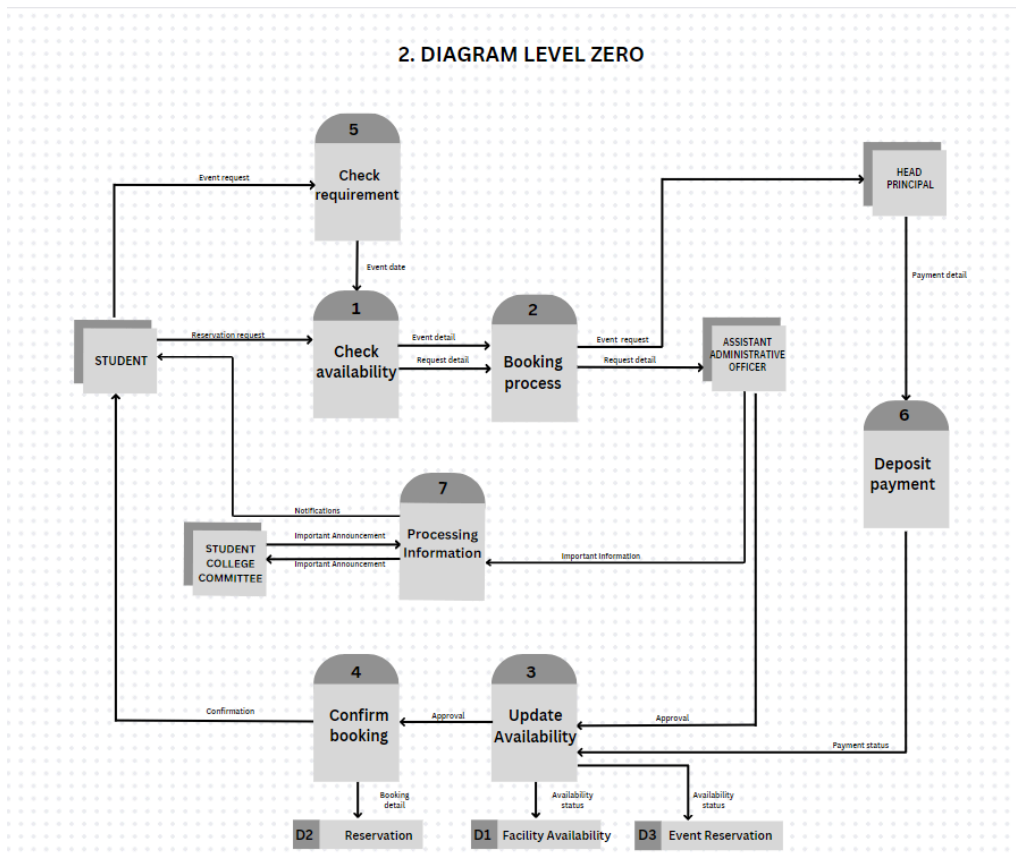
5.4.2 Diagram Level 0
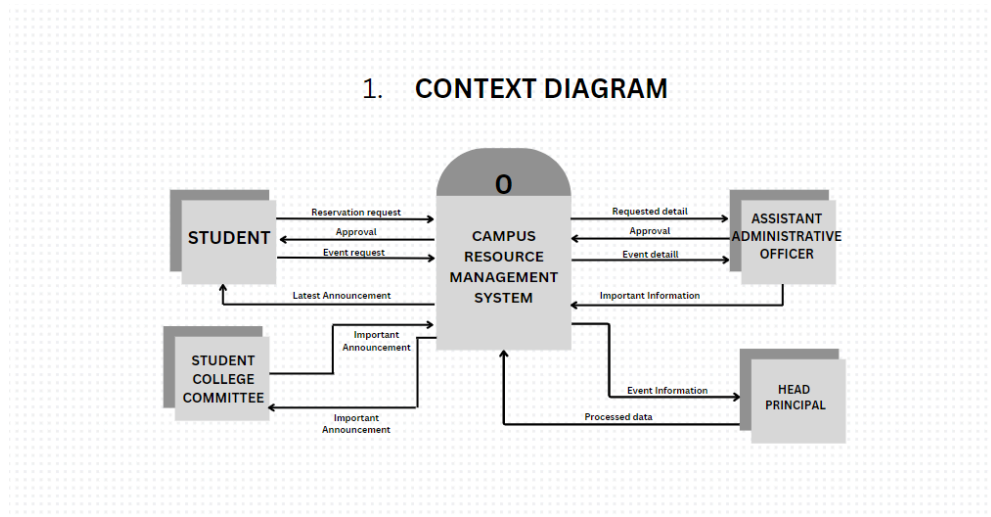
2. DIAGRAM LEVEL ZERO
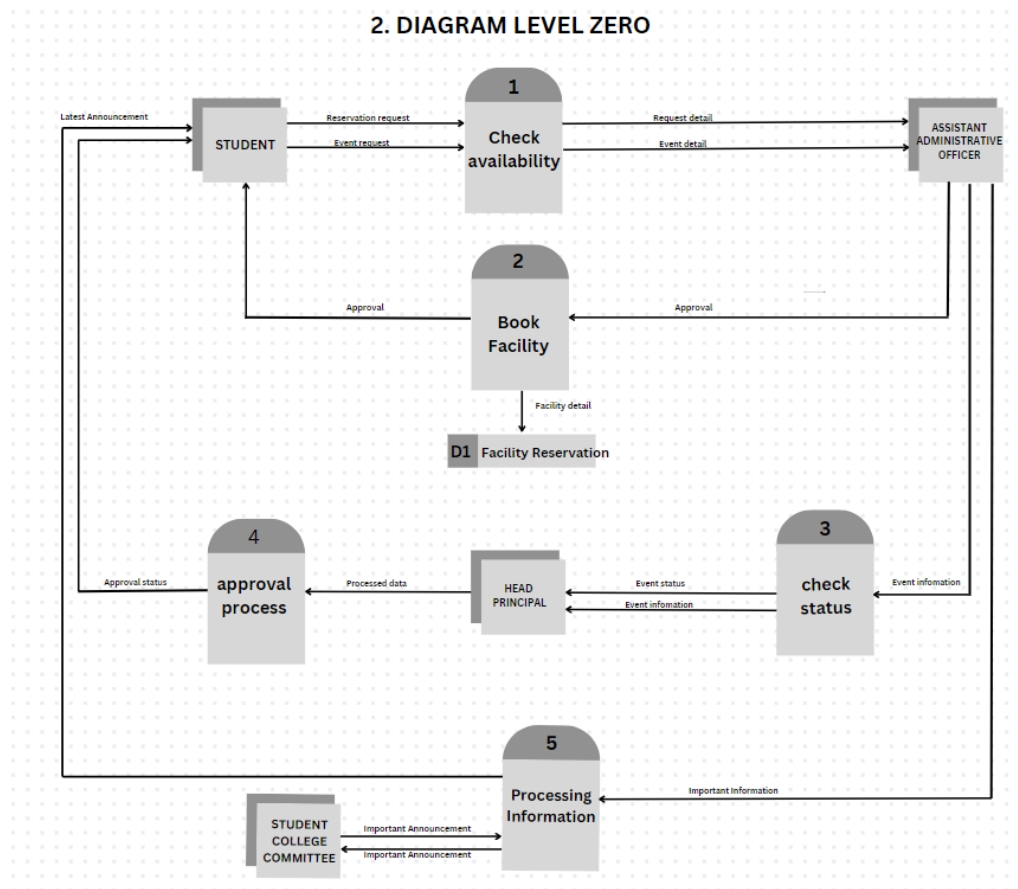
5.4.2 Child Diagram
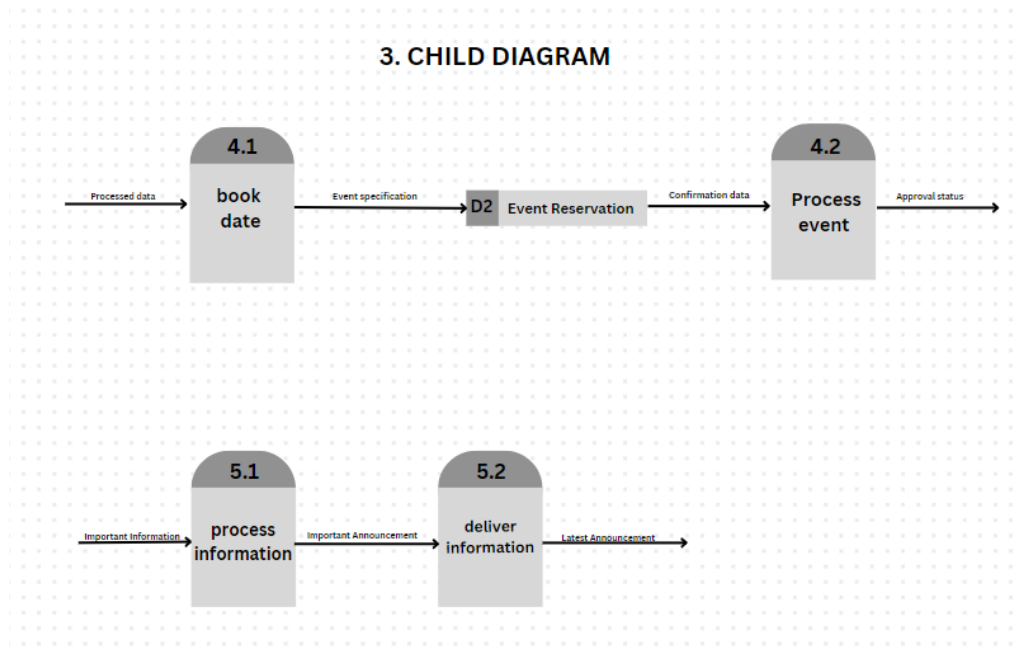
3. CHILD DIAGRAM

5.5   Logical DFD TO-BE System
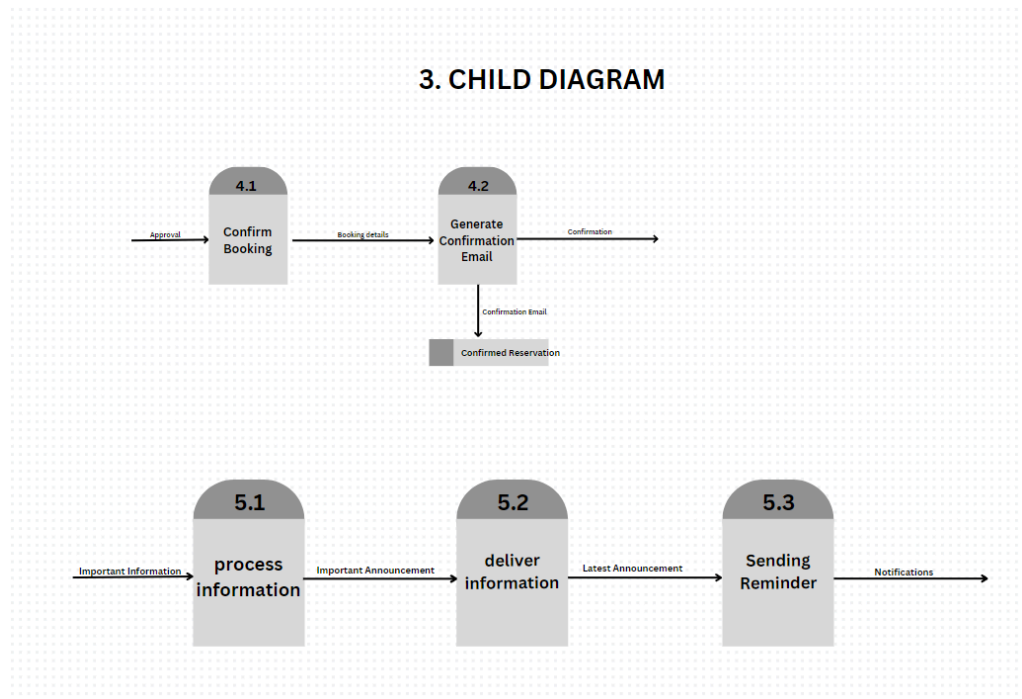
5.5.1 Context Diagram

5.5.2 Diagram Level 0

5.5.3 Child Diagram

5.6   Physical DFD TO-BE System

5.6.1 Context Diagram
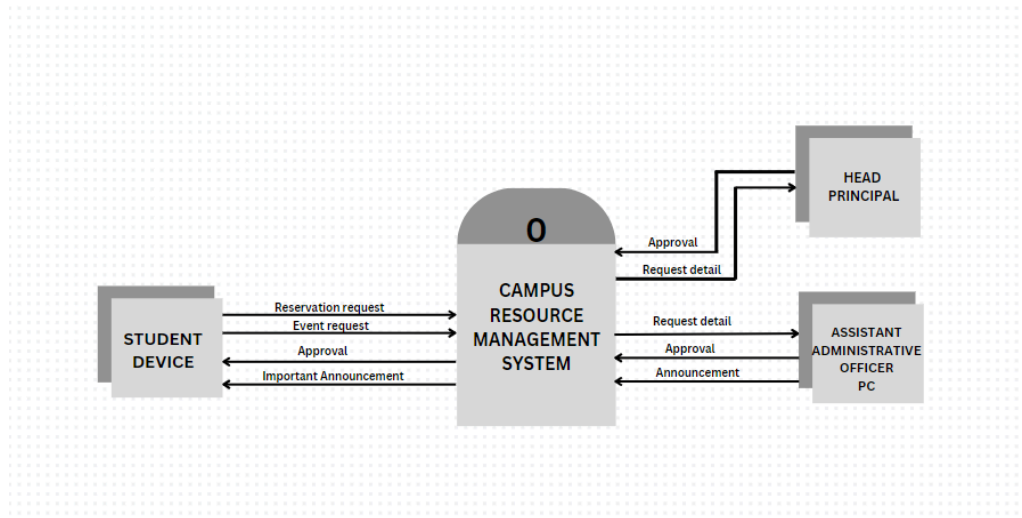
5.6.2 Diagram Level 0

2. DIAGRAM LEVEL ZERO
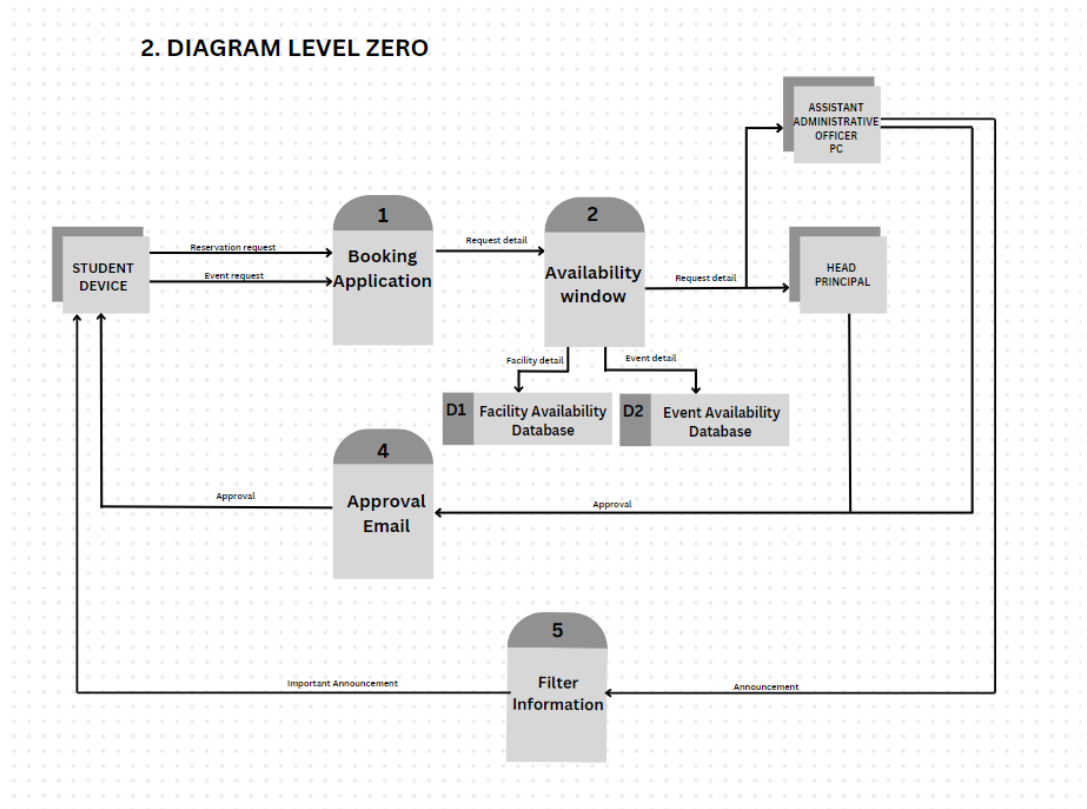
6. SUMMARY OF REQUIREMENT ANALYSIS

The AS-IS campus resources management system of our stakeholder , Tun Dr. Ismail College mostly used the manual way to book the event and also the facility. In this term, in order to increase the efficiency for facility and event booking, an automated system should be more efficient since it can decrease the use of papers to keep up with our Sustainable and Development Goal and also can reduce the time for the people to book the facility and event.

The function for the TO-BE system is as follows:

1. Booking facility and event through the system without needing to go in person to the office.
2. Event organisers can check the availability of the date through the system.
3. Administrator is able to manage the booking process efficiently in digitalised form.
4. Notifications will be sent to users when the booking process is approved for confirmation.
5. Students data management through the system.
6. Notifications and reminders about the latest event and important announcement will be given through the system to the student's device.

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