



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
Faculty of Engineering

Group Project

SECD2613 SYSTEM ANALYSIS AND DESIGN
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Title: UTM Transport System

Stage: Phase 2

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1.0 OVERVIEW OF THE PROJECT

The UTM Transport System presents an innovative solution aimed at revolutionizing student transportation within the university environment. Recognizing the critical role transportation plays in facilitating academic pursuits and campus life, this project endeavours to introduce a comprehensive platform that seamlessly connects students in need of transportation with willing drivers within the university area. By harnessing the power of mobile technology, this system aims to enhance accessibility, efficiency, and safety while providing students with greater flexibility and control over their transportation needs.

This project entails the development of mobile applications tailored for both students and drivers, empowering users to request, manage, and track rides with ease. Through the implementation of advanced features, such as ride customization, fare negotiation, and ride scheduling, students can enjoy a personalized transportation experience that aligns with their preferences and schedules. Additionally, drivers are equipped with tools to efficiently manage ride requests, ensuring timely and reliable service delivery.

Furthermore, this system prioritizes safety and security, incorporating measures to verify drivers, safeguard financial transactions, and comply with regulatory standards. By fostering transparency and accountability in financial processes and implementing robust security protocols, the system aims to instil confidence in users and uphold their trust.

Overall, the UTM Transport System represents a significant step forward in enhancing the transportation infrastructure within the university community. By providing students with convenient, affordable, and safe transportation options, this project seeks to enrich the overall student experience and contribute to a thriving campus environment.

2.0 PROBLEM STATEMENT

1. Insufficient Flexibility:

The university-provided bus service lacks punctuality and operates strictly within predetermined schedules, resulting in inconvenience for students who require transportation outside of these fixed timings.

2. Affordability Concerns:

Taxi and Grab services within the university premises often command prices that are beyond the financial means of many students, rendering them unaffordable for a significant portion of the student body.

3. Limited Mobility Options:

A considerable number of students do not possess their own means of transportation, thereby restricting their ability to commute to classes or other university activities.

4. Time Mismanagement:

Students are frequently required to arrive early at bus stops to ensure they do not miss their scheduled transportation. This waiting time can be significant, leading to potential disruptions to their academic schedules if buses are missed.

5. Financial Constraints:

At the end of the month, many students find themselves with limited funds, making it challenging to allocate resources for essential projects and necessary software purchases.

6. Safety Concerns:

Instances have been reported where students, particularly women traveling alone, have encountered safety risks due to immoral behaviour from some external drivers taking advantage of their vulnerability.

7. Lack of Real-Time Updates:

The current bus system occasionally lacks accuracy or fails to arrive altogether, particularly in more severe instances. This could be attributed to bus breakdowns or other unforeseen issues that occur without students' awareness.

3.0 PROPOSED SOLUTIONS

UTM Transport System introduces a novel approach to student transportation, offering rides to any location within the university area. This system enables students to request rides at their convenience, provided there is a willing driver available. It includes features such as real-time availability updates for both car and motorcycle drivers, as well as accurate live bus schedule updates based on driver locations, ensuring students are well-informed about transportation options.

Furthermore, students can utilize the application to communicate with drivers and negotiate fares, thereby offering them flexibility in pricing arrangements, ensuring affordability for those facing financial constraints, especially during adverse weather conditions. Unlike other transportation apps that may implement surge pricing during peak times or traffic congestion, the UTM Transport System maintains consistent fares regardless of demand fluctuations.

Additionally, students have the option to book motorcycle rides, provided both if the student and driver are of the same gender, with helmets provided for safety. This feature helps to reduce transportation costs for student if they are alone.

Rather than relying on on-the-spot bookings, the system allows students to schedule rides in advance based on driver availability. Students can specify their preferred date and time, ensuring punctual pick-ups, with notifications sent to both students and drivers to prevent missed rides. All the booking, destination history dan payment are recorded able to view by both students and drivers.

Recognizing the financial challenges students face, the system offers opportunities for students with personal vehicles to become drivers, provided they possess a valid license and UTM vehicle sticker. This not only allows students to earn extra income to support their studies but also ensures passenger safety through driver examination and background checks, particularly for women passengers.

In addition, UTM administration and Academic Advisor can access all the driver's activity and location when on duty. If any of the driver did not perform in their assignment or examination, they could get warning or fired as a driver. This precaution is to ensure that students priorities academic before finding side-income.

Moreover, event organizers have the capability to input changes in the event calendar, including updates to the location and date of specific events. This functionality serves to alert both students and drivers about potential traffic delays during the event. Additionally, students can oversee their bookings and make cancellations, if necessary, up to one day prior to the booking, as all reservations will be visible in their calendar and ensuring smooth process.

Finally, the system will incorporate all crucial dates such as exams and their respective locations based on the student's subject and section. Prior to exams, students will receive notifications estimating traffic conditions and advising them to arrive at least 30 minutes early. This feature aims to guarantee that every student can attend their exams punctually without any risk of lateness or oversight.

4.0 INFORMATION GATHERING PROCESS

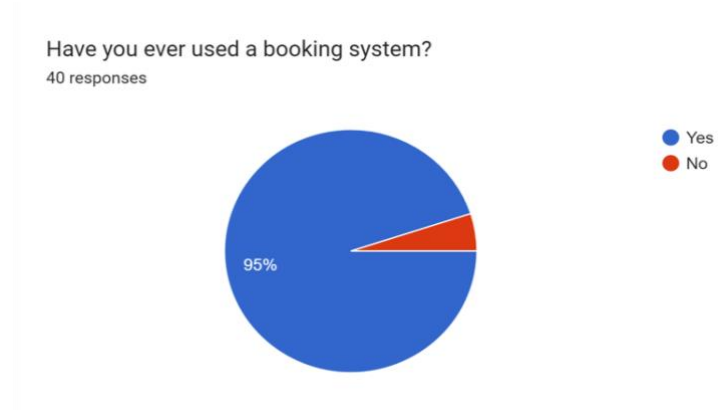
4.1 Method Used

We used a Google Form questionnaire with both closed- and open-ended design questions, as well as an interview session, to gather more information about the UTM transport system. We successfully gathered data from 40 people inside UTM by asking them seven questions.

4.1.1 Questionnaires

Question 1

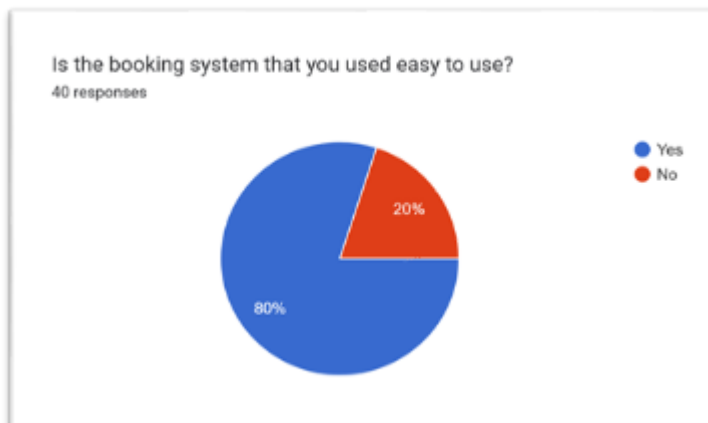
Have you ever used a booking system?



Most respondents to the questionnaire indicated that they had prior experience using booking systems. It demonstrates the significance of reservation systems in UTM. They might use Grab or another transport service to book their daily route.

Question 2

Is the booking system that you used easy to use?



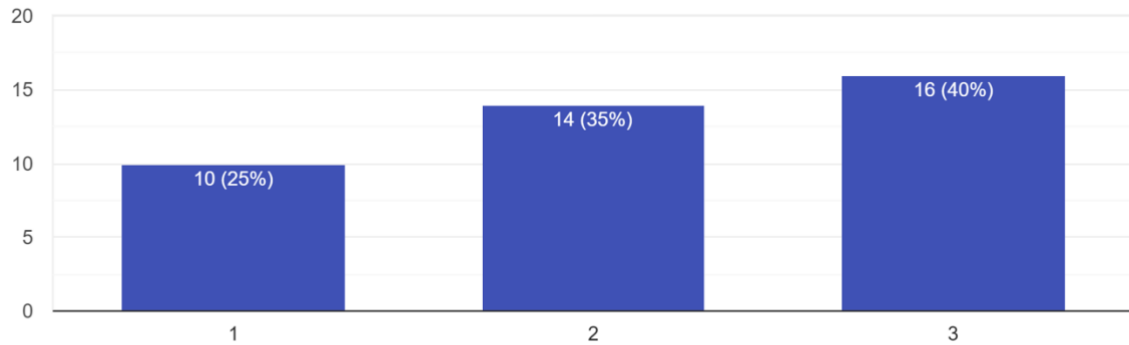
80% of those surveyed thought the booking system was user-friendly. This demonstrates that anyone can use it without having to learn anything; alternatively, perhaps they just need to pick up a few fundamental skills, like how to book, to get started.

Question 3

How often do you use booking system?

How often do you use booking system?

40 responses



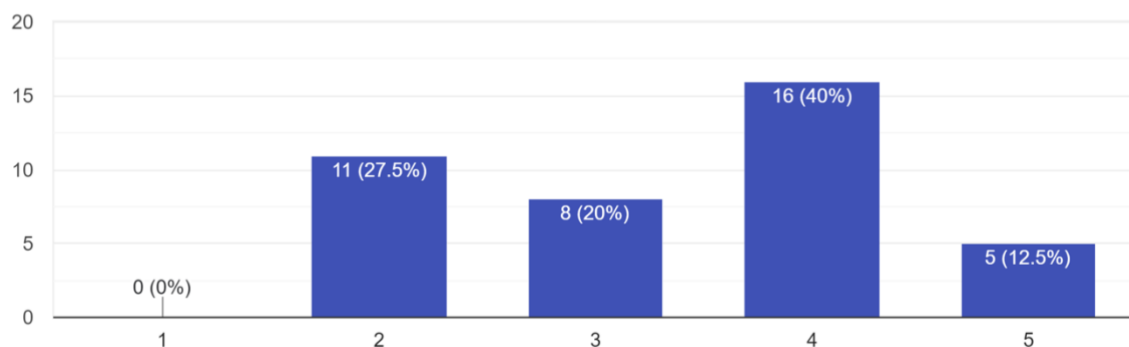
We are interested in knowing how frequently they utilise the book system in this section of the question: One indicates never use, two indicate average use, and three indicate as often use. This indicates that 16 users use the system frequently, 14 users use it on average, and 10 users never use it. Considering that 14 other people may also use it frequently, this indicates that people use it almost regularly.

Question 4

Do you think your data is safe in the booking system?

Do you think your data is safe in the booking system?

40 responses



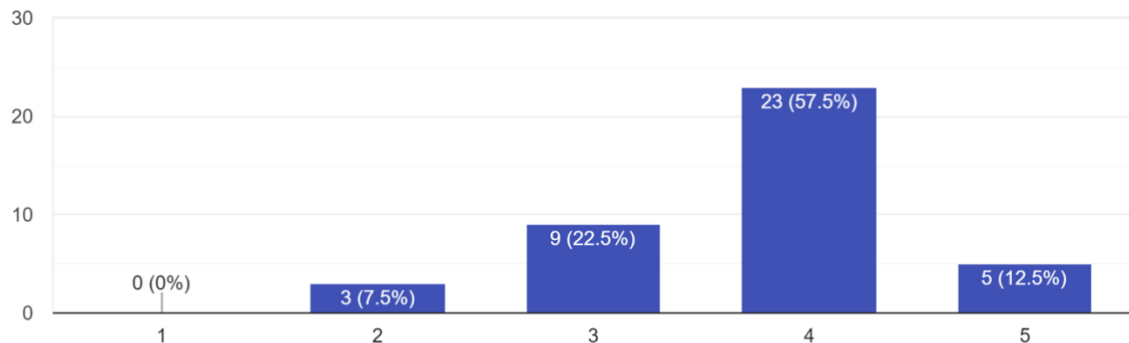
According to the chart, 16 respondents feel secure, 5 feel very secure, 8 feel neutral, 11 feel slightly secure, and none feel not secure, indicating that respondents agree and confidently feel that their data is safe in the booking system. Because of data breaches that occur on some systems that may have inexpensive cyber security for their data protection, they may be marginally less secure.

Question 5

Do you think the booking fee is expensive?

Do you think the booking fee is expensive?

40 responses



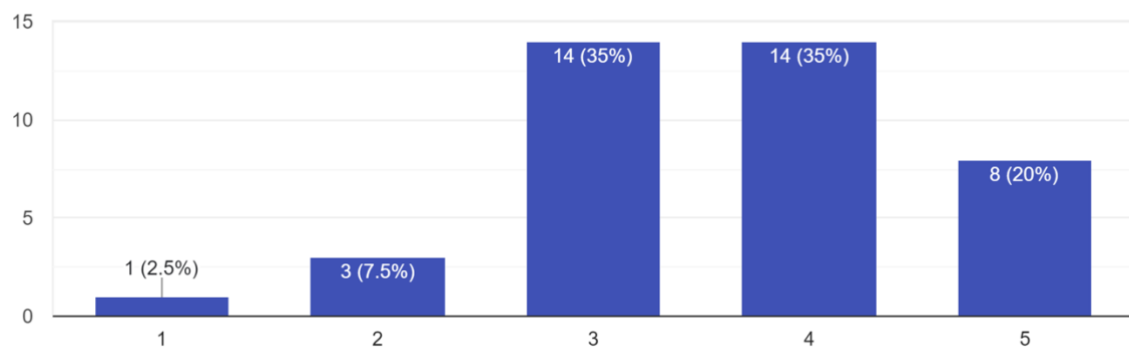
23 out of 40 respondents thought the booking system was a little pricey, according to the chart. This could be the result of pre-existing costs, preparation costs, or system development costs.

Question 6

Does the booking system ease your daily needs?

Does the booking system ease your daily needs?

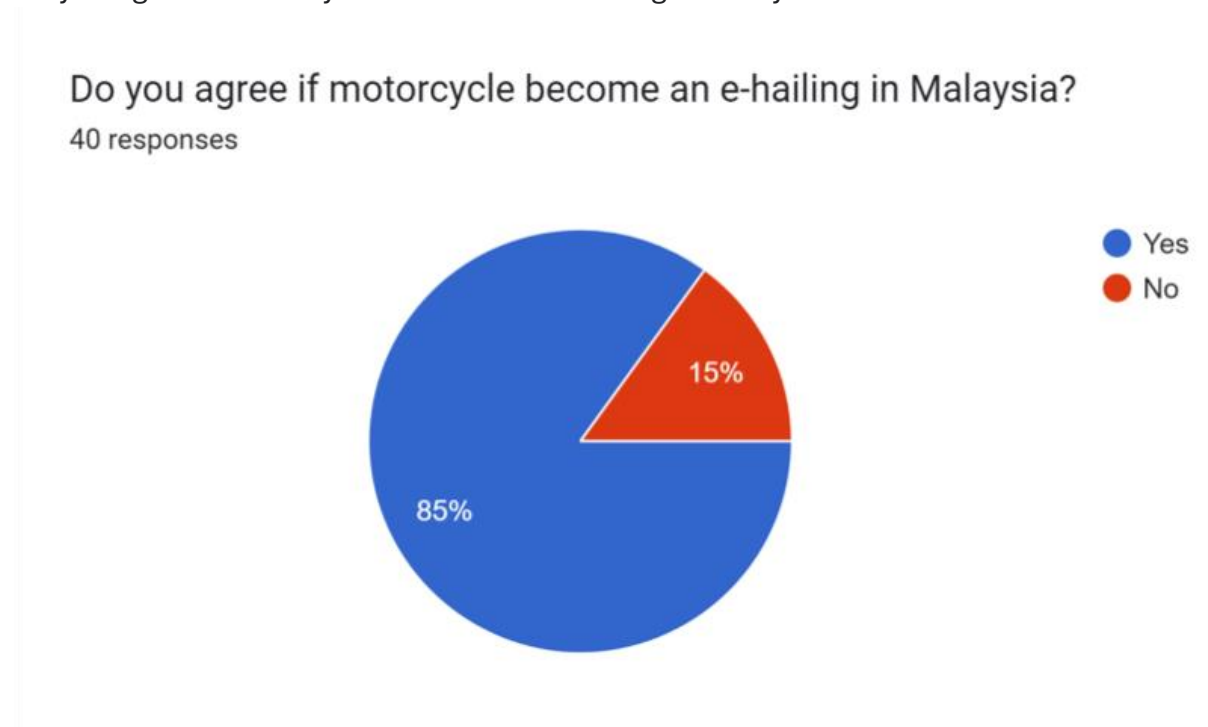
40 responses



People view the booking system as a daily need; with 36 people, they see it as a daily life routine. It shows that booking systems help people ease their lives, such as by going somewhere or maybe for other reservations.

Question 7

Do you agree if motorcycle become an e-hailing in Malaysia?



85% of survey participants support the inclusion of motorcycles in Malaysia's e-hailing network. It could be less expensive and time-consuming. It's less expensive and a convivial time. For instance, single people who need to schedule transportation would prefer to reserve a motorbike rather than a four-seater vehicle.

4.1.2 Interviewing

Name	MUHAMMAD BIN YUNUS
Position	COOPERATIVE ASSISTANT
Question	Answer
Open ended	
1) Is the KTDI facility booking procedure adequate?	<ul style="list-style-type: none"> • They are still good and relevant. • Still satisfied with the system because the physical form system still relevant for a post term analysisist.
2) What are the suggestions for improving the disposal system at KTDI?	<ul style="list-style-type: none"> • The officer wants to create a system that helps students know about facilities availability. • He recommended to create a system that display availability such as calendar so other student or staff can check it before they want to book the facilities.
Close ended	
3) How to book KTDI facilities (etc: Dewan Resak)?	<ul style="list-style-type: none"> • KTDI still using the old school system which is using a physical form. • After the form was collected it will be sent to the highest officer to check for an approval. • After KTDI request have been approve then the facility booking complete.
4) What is the process to keep the booking record?	<ul style="list-style-type: none"> • The officer said that they are keep the booking record inside excel and the other highest officer can access it. • Which mean the record are quite safe. • They didn't erase any record since 2022. • The record was collected and sent to Residency Unit.
5) Are there any charges to book facility?	<ul style="list-style-type: none"> • As now in 2024, they still not put any fees to student to book it, as long the Highest officer approve their booking request. • For UTM outsider they might need to pay a fee to book the facilities.

4.1.3 STROBE

Title and Abstract

Title: "Structured Observation of UTM Booking System"

Background: This STROBE study aims to systematically observe and document various process of booking in UTM and analyse how they process and store the data.

Methods: At KTDI UTM, we carried out organised observations. Records are kept of environmental elements like office space, file racks, and additional items like desks and chairs. Both the working environment and the employees' clothes are scrutinised.

Results: From the observation, we can see that the folder rack is organised, and that the area is clean. that time everyone is dressed casually; they are all working quietly.

Conclusions: They can review any older data quickly and effectively thanks to a well-organized folder of data they gather.

4.2 Summary of Method Used

We were able to discover more about the booking system's perceptions by UTM employees and students. We can learn more about the user's level of trust in the system's ability to gather and store their data from the survey. We also learn about their opinions regarding the type, price, and mobility of the vehicle, as well as their perceptions of the booking data system as a daily necessity. The interview with Mr. Muhammad bin Yunus, a KTDI cooperative assistant, provided us with a wealth of information regarding the operation of the KTDI booking system and data security. Following our Google Form survey, we received feedback on several additional features, including the preference for motorcycles over cars and their views on data security.

5.0 REQUIREMENT ANALYSIS

5.1 Current Business Process (Scenarios, Workflow)

Here are the scenarios and workflow of current business process for Students:

1. Go to counter.
2. Give request details.
3. Write the request in form.
4. Wait for confirmation from Administration and Event Manager.

Here are the scenarios and workflow of current business process for Administration:

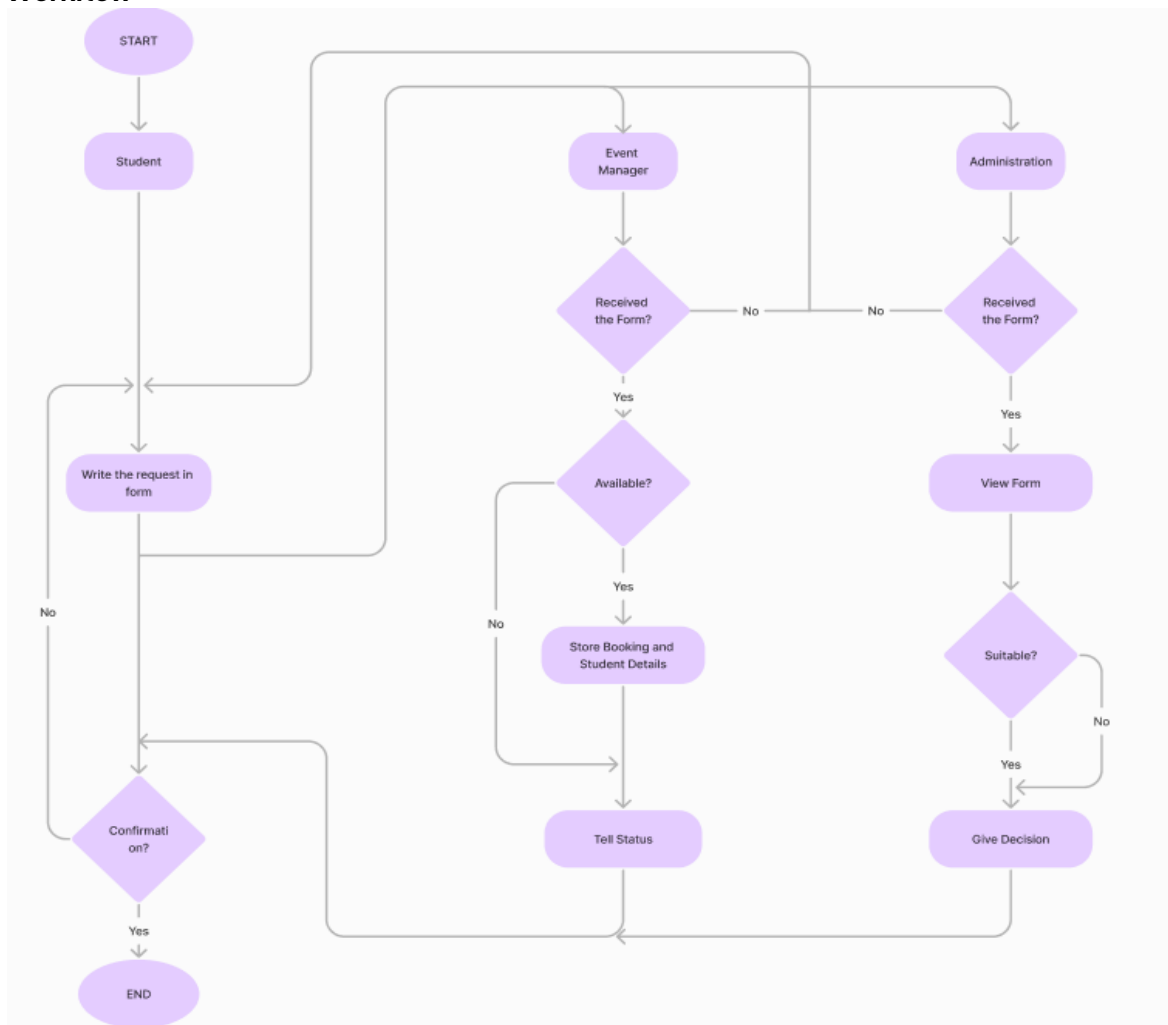
1. Receive the form from Staff Assistant.
2. View the form.
3. Determine whether the request is suitable to be conducted or not.
4. Give the decision to Staff Assistant.

Here are the scenarios and workflow of current business process for Event Manager:

1. Receive the form from Staff Assistant.
2. Check the availability.
3. If available, store the booking details and student details.
4. Tell the status to Staff Assistant.

AS-IS System

Workflow



5.2 Functional Requirement (Input, Process, and Output)

5.2.1 Context Diagram

PROCESS	INPUT	OUTPUT
UTM TRANSPORT BOOKING SYSTEM	Request Physical Form Booking Approval Form Details	Order Availability Decision Form Email

5.2.2 Level 0 Diagram

PROCESS	INPUT	OUTPUT
Write Order	Request	Order
Send Form	Physical Form	Form
View Form	Form Details	Decision
Check Availability	Form Details	Availability Student Information Booking Information
Send Email	Booking Approval	Email

5.2.3 Level 1 Diagram

5.2.3.1 Process 3: VIEW FORM

PROCESS	INPUT	OUTPUT
Check Suitability	Form Details	Suitability
Make a Decision	Suitability	Decision

5.2.3.2 Process 4: CHECK AVAILABILITY

PROCESS	INPUT	OUTPUT
Check Date and Time	Form Details	Date and Time
Book a Place	Date and Time	Booking Information Student Information Availability

5.3 Non-Functional Requirement (Performance and Control)

5.3.1 Performance

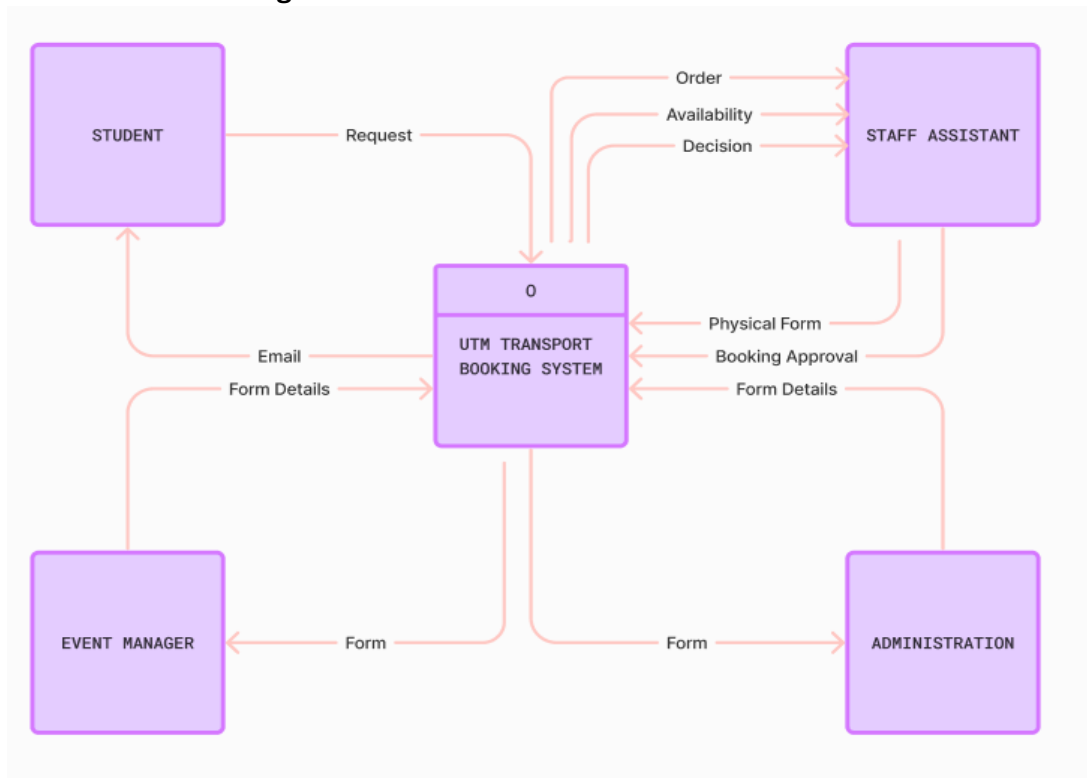
- The booking system still use physical form.
- It takes 1 week to get a confirmation from Administration and Event Manager.

5.3.2 Security

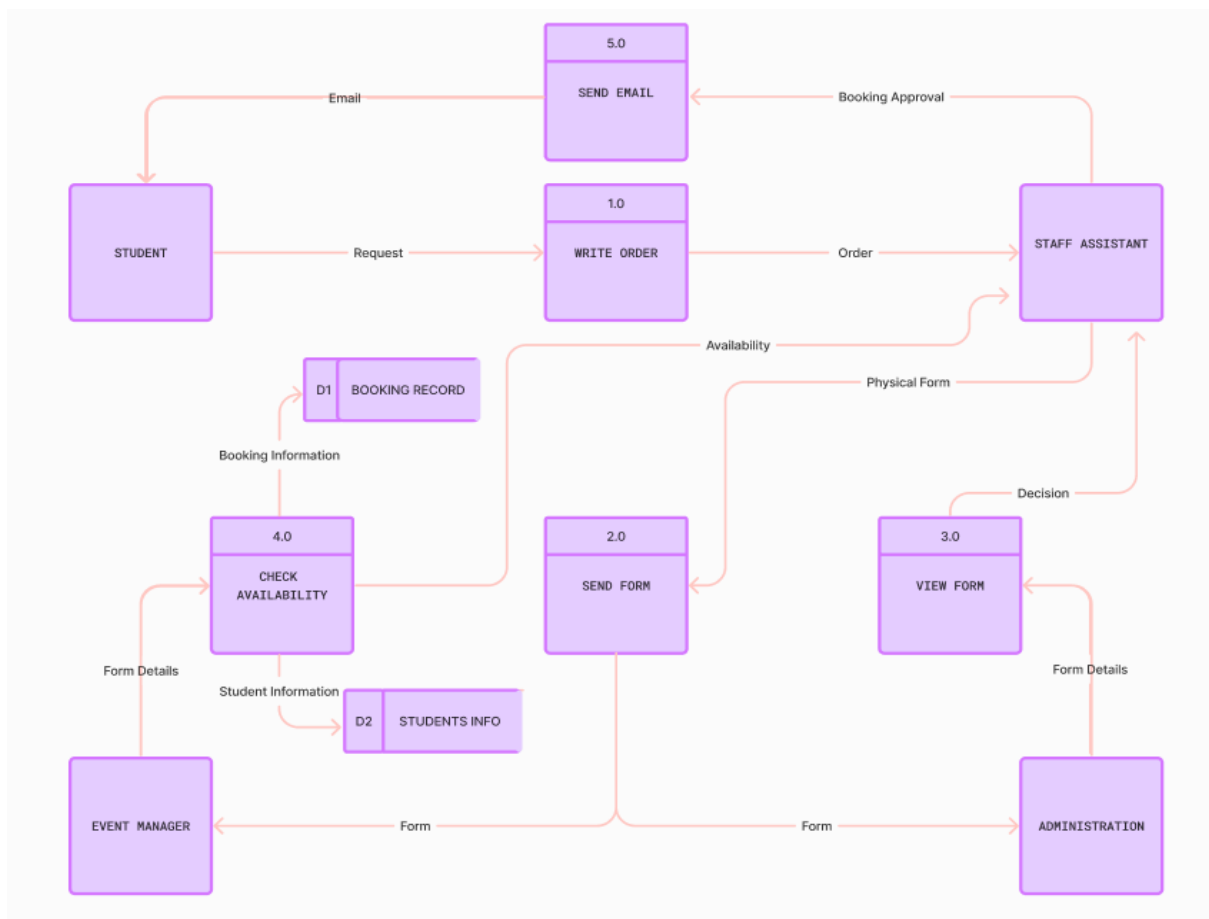
- The booking and student information are stored in Excel which is safe and secured.

5.4 Logical DFD AS-IS system (Context Diagram, Zero Diagram, Child Diagram)

5.4.1 Context Diagram

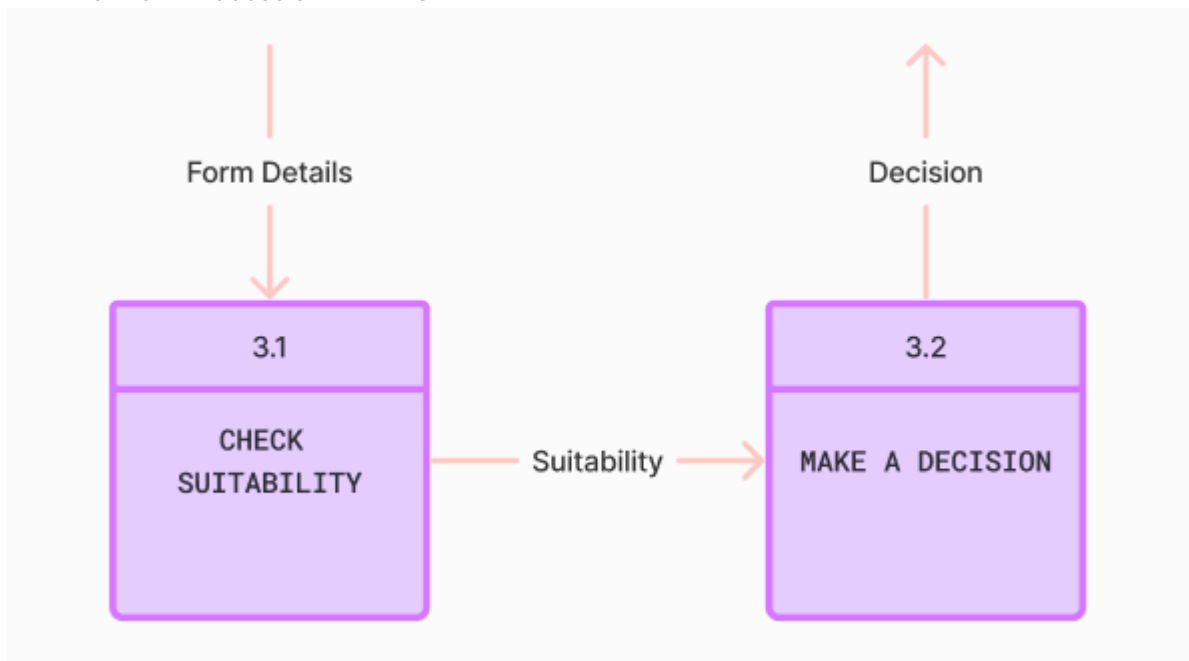


5.4.2 Zero Diagram

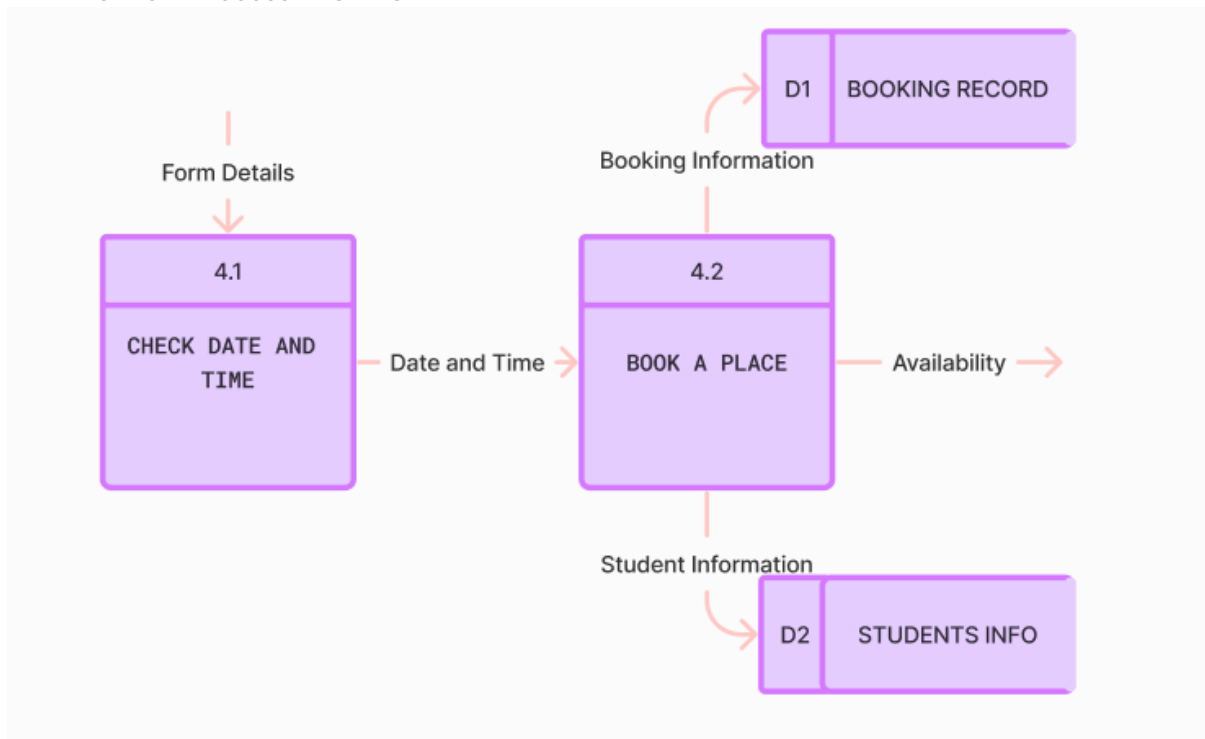


5.4.3 Child Diagram

5.4.3.1 Process 3: VIEW FORM



5.4.3.2 Process 4: CHECK AVAILABILITY



6.0 SUMMARY OF REQUIREMENT ANALYSIS PROCESS

The UTM transportation system has several parts that are done manually. These can be changed to automate so that it is more efficient and minimise the human mistake. Some facilities also can be added to the system to decrease the workload. The function of the To-Be system are as follows:

- 1.** It will offer ride to any location within the university area.
- 2.** Students can communicate with drivers and negotiate fares.
- 3.** Students will have the option to book motorcycle ride.
- 4.** The system will allow students to schedule rides.
- 5.** The system will allow both extra income for some students and also passenger safety.