UTM UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
Faculty of Engineering

Group Project

SECD2613 SYSTEM ANALYSIS AND DESIGN
SEMESTER II, SESSION 2023/2024

Title: UTM Transport System

Stage: Phase 3

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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 CURRENT BUSINESS PROCESS/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:

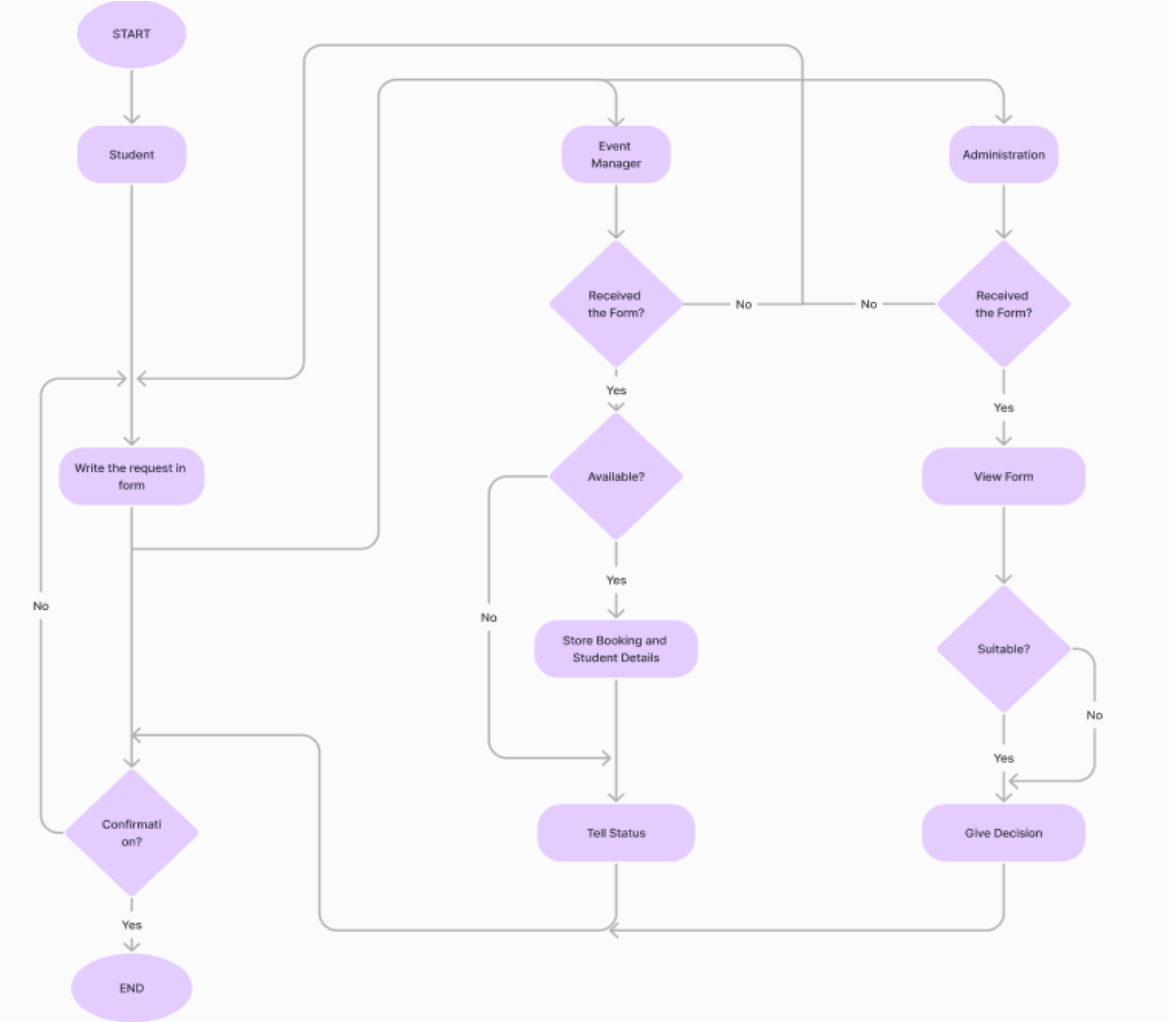
1. Receive the form from Staff Assistant.
2. View the form.
3. Determine whether the request is suitable to be conducted or not.
4. Give the decision to Staff Assistant.

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.

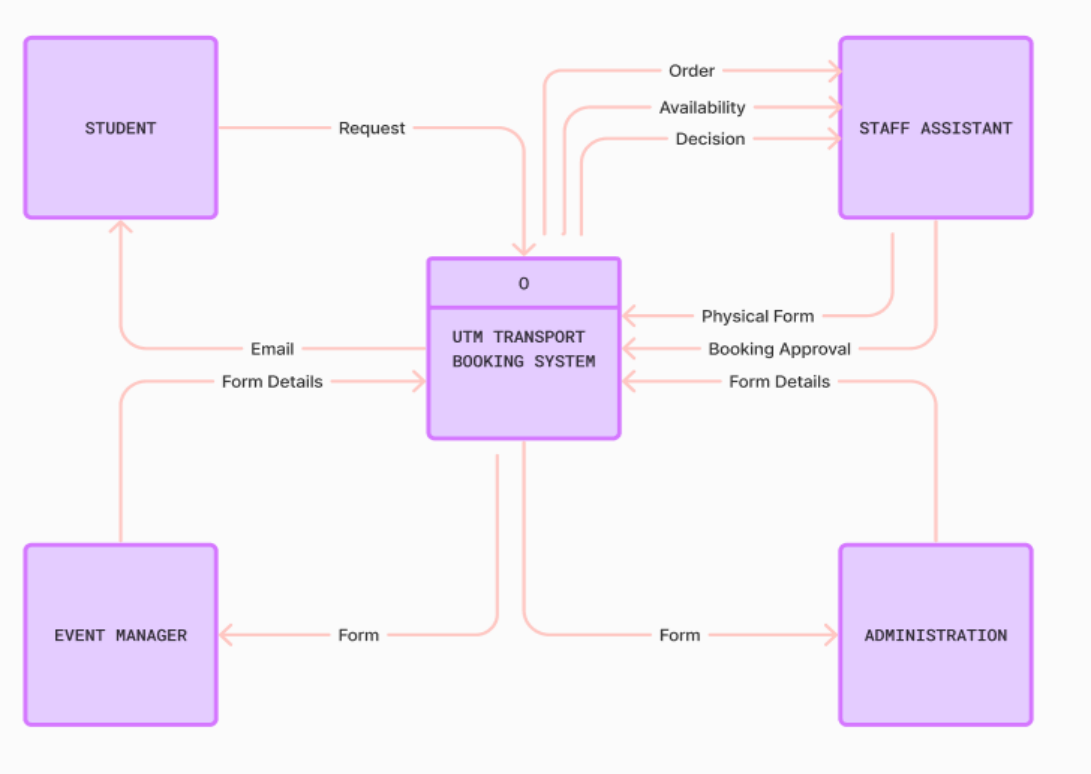
AS-IS System

Workflow

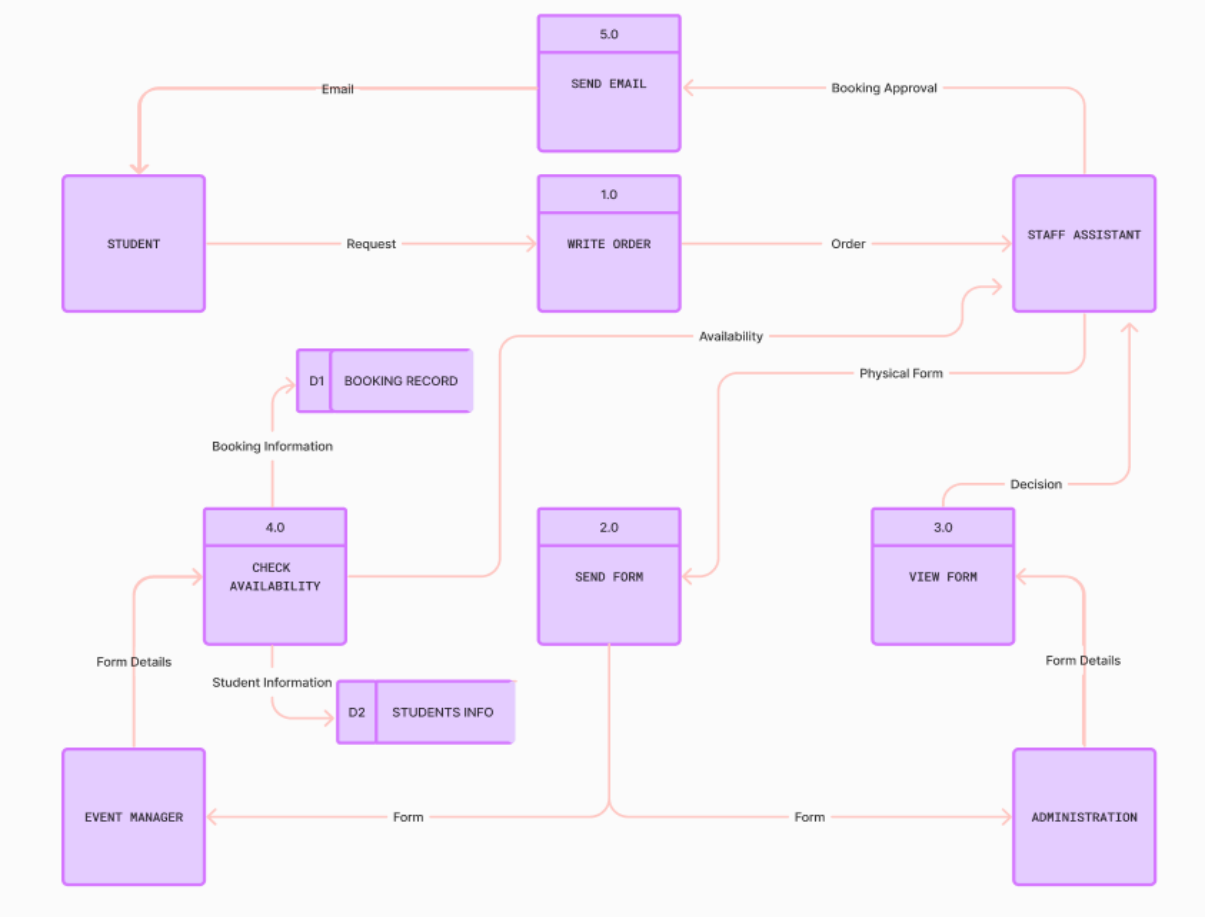


5.0 Logical DFD AS-IS system (Context Diagram, Zero Diagram, Child Diagram)

5.4.1 Context Diagram

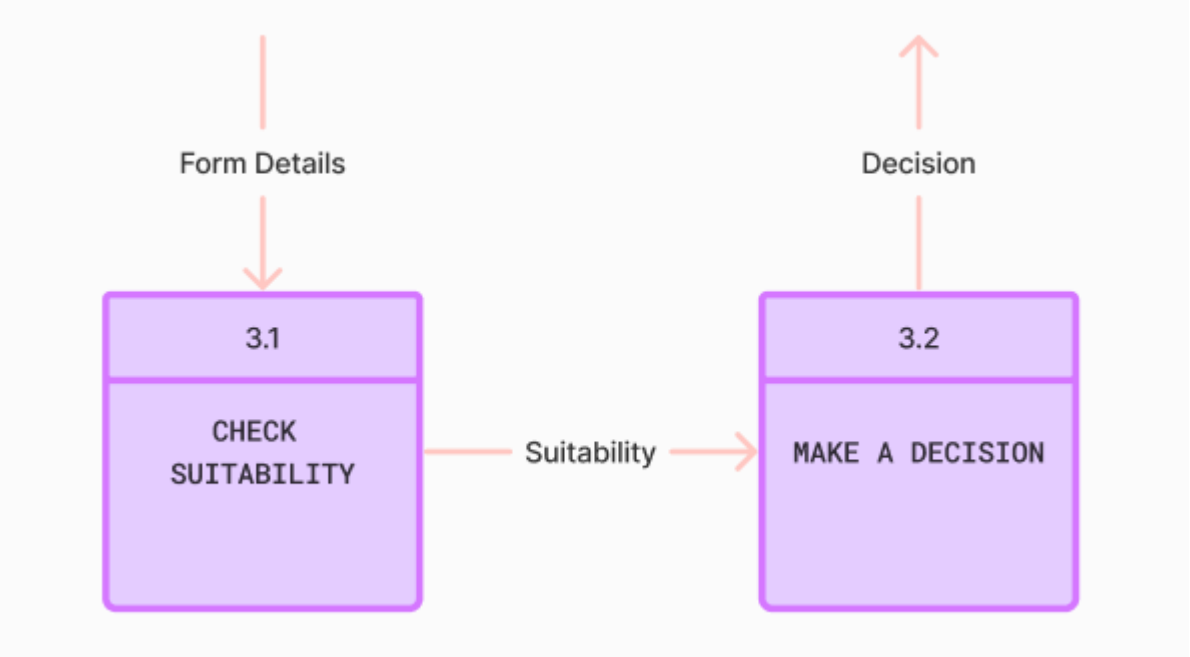


5.4.2 Zero Diagram

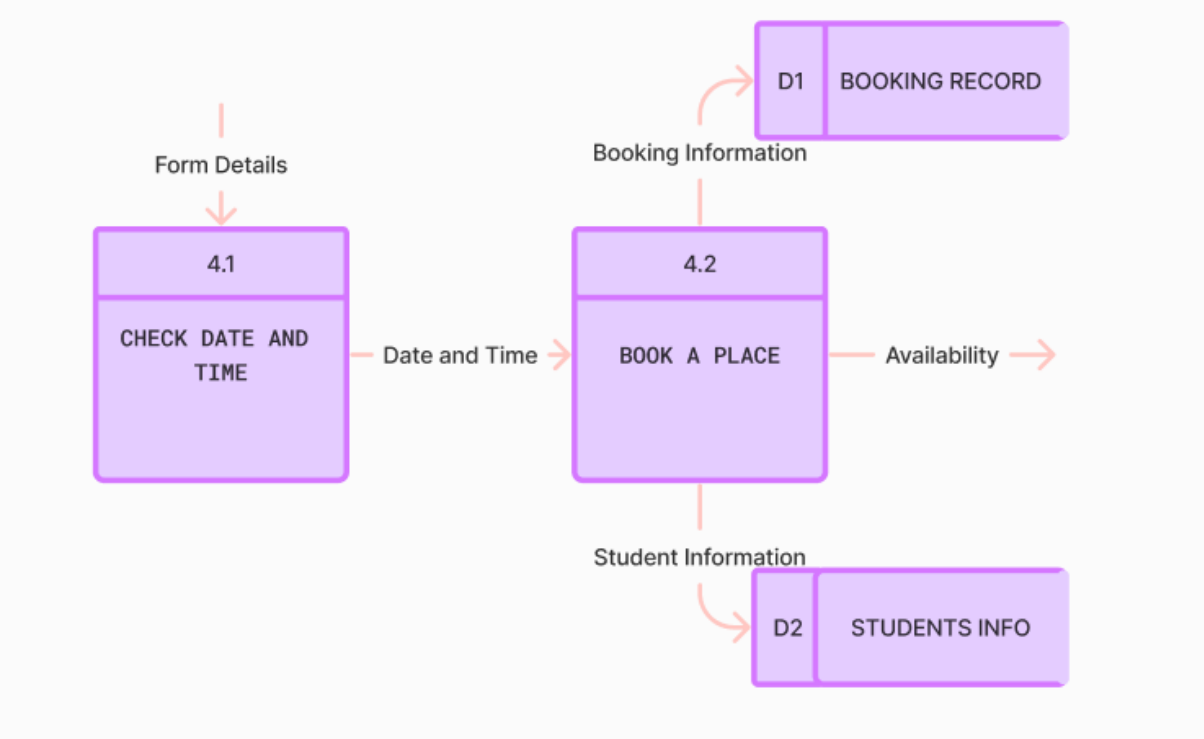


5.4.3 Child Diagram

5.4.3.1 Process 3: VIEW FORM



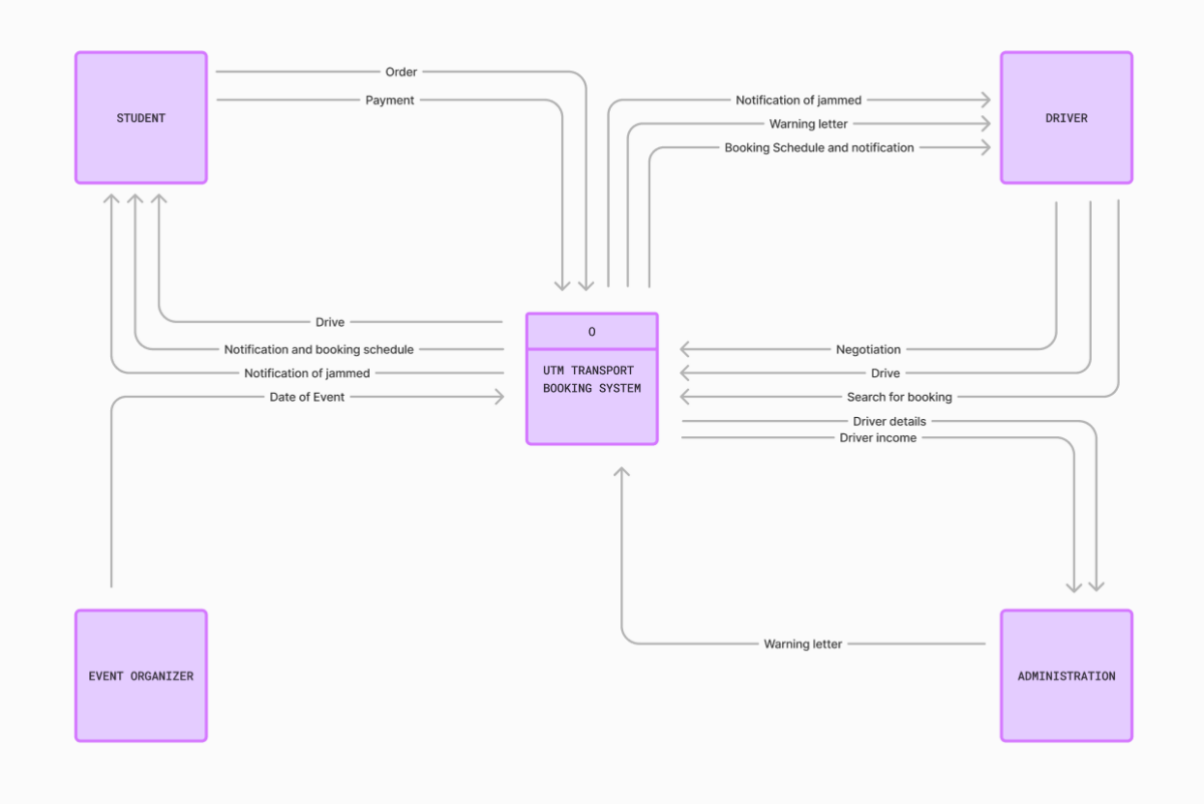
5.4.3.2 Process 4: CHECK AVAILABILITY



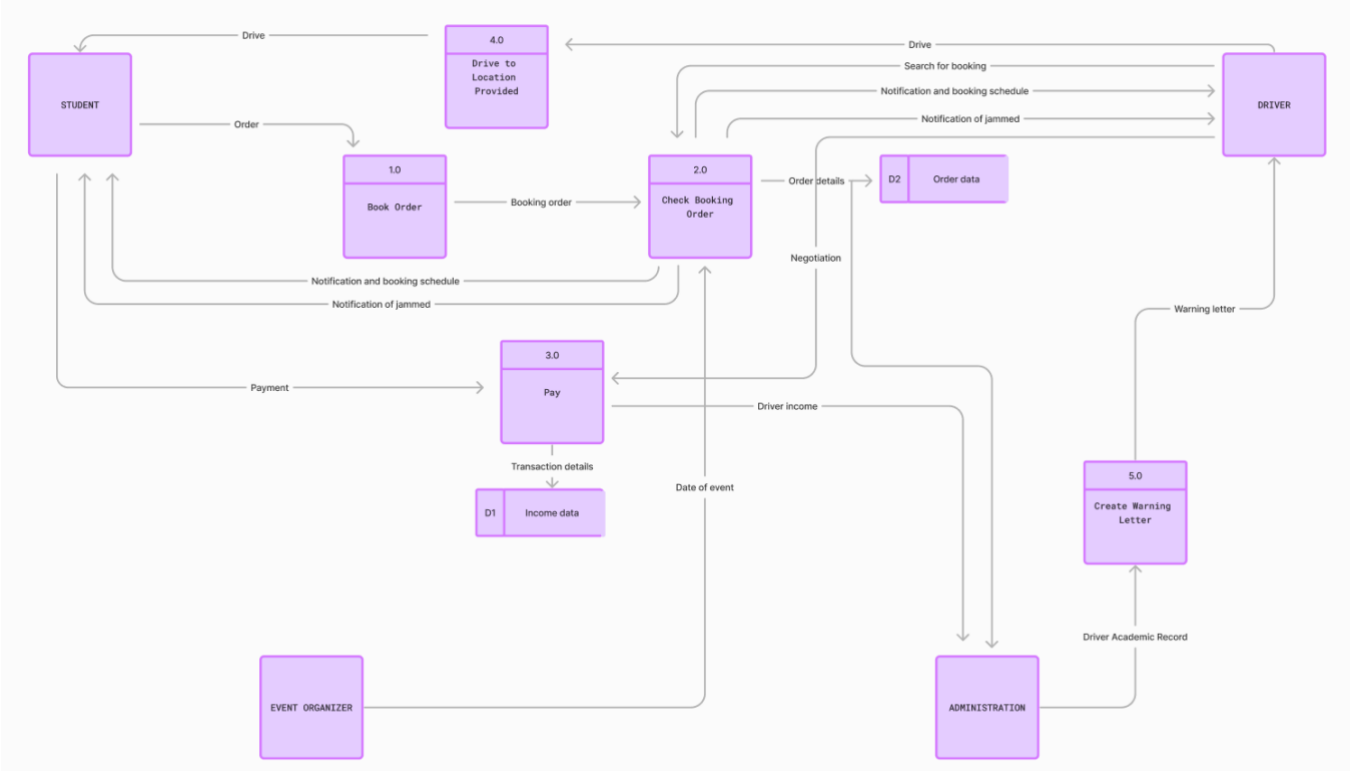
6.0 SYSTEM ANALYSIS AND SPECFICATION

6.1 Logical DFD TO-BE system(Context Diagram, Diagram 0, Child Diagram)

6.1.1 Context Diagram

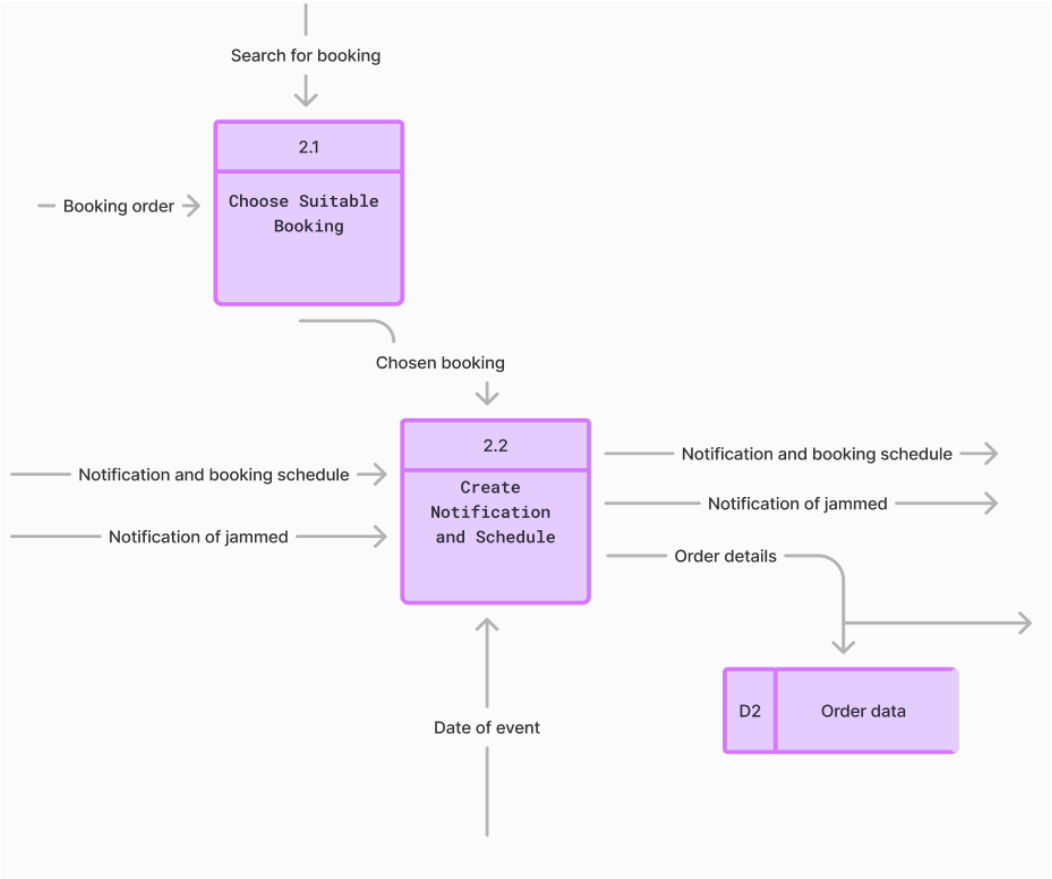


6.1.2 Zero Diagram

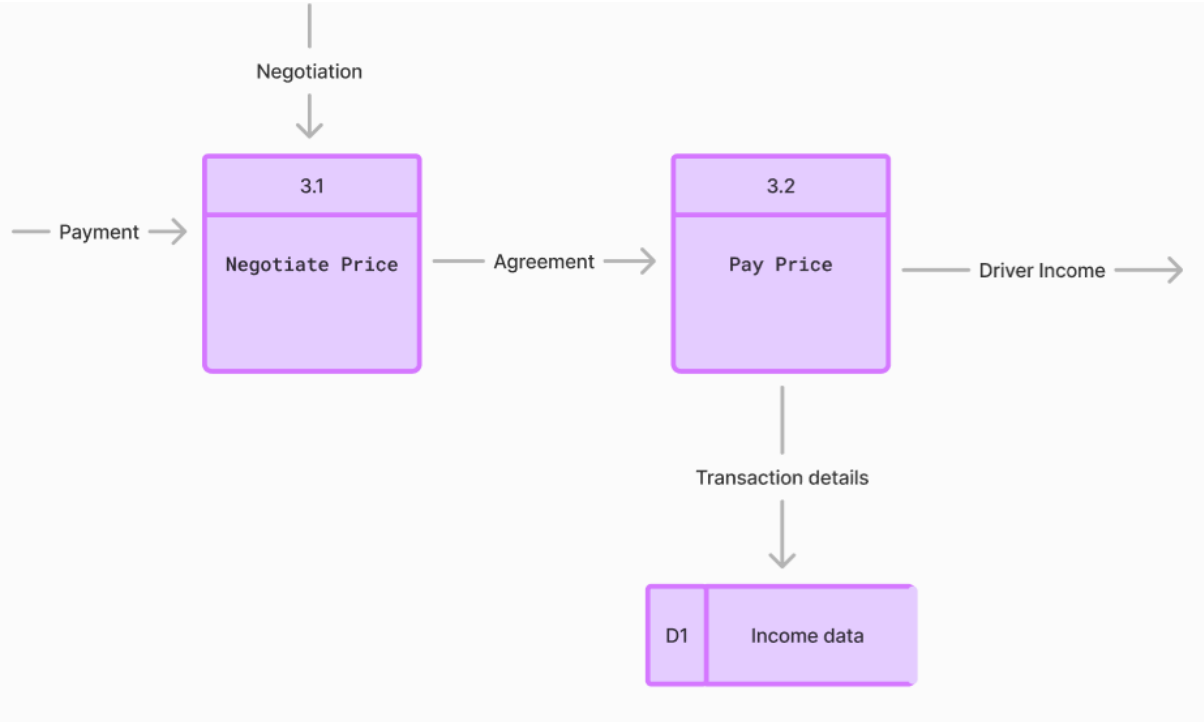


6.1.3 Child Diagram

6.1.3.1 Process 2: Check Booking Order



6.1.3.2 Process 3: Pay



6.2 Process Specification

6.2.1 Book Order

DO

READ booking order

BEGIN IF

IF student book

Read the order details

THEN update the booking status

6.2.2 Check Booking Order

DO

READ booking order

READ date of event

READ driver selected booking

BEGIN IF

IF order selected

READ the booking detail

THEN update the booking detail

Store the valid order into database

6.2.3 Pay

DO

READ agreement

BEGIN IF

IF agreement is achieved

READ the fees

THEN update the booking detail

Store the fees into database

6.2.4 Drive to pick up and destination location

DO

READ chauffeur

BEGIN IF

IF day of booking date

Update both student and driver

Update the payment to driver

Store order income data into database

6.2.5 Warning Letter

DO

READ Driver academic record

BEGIN IF

IF academic requirement does not meet

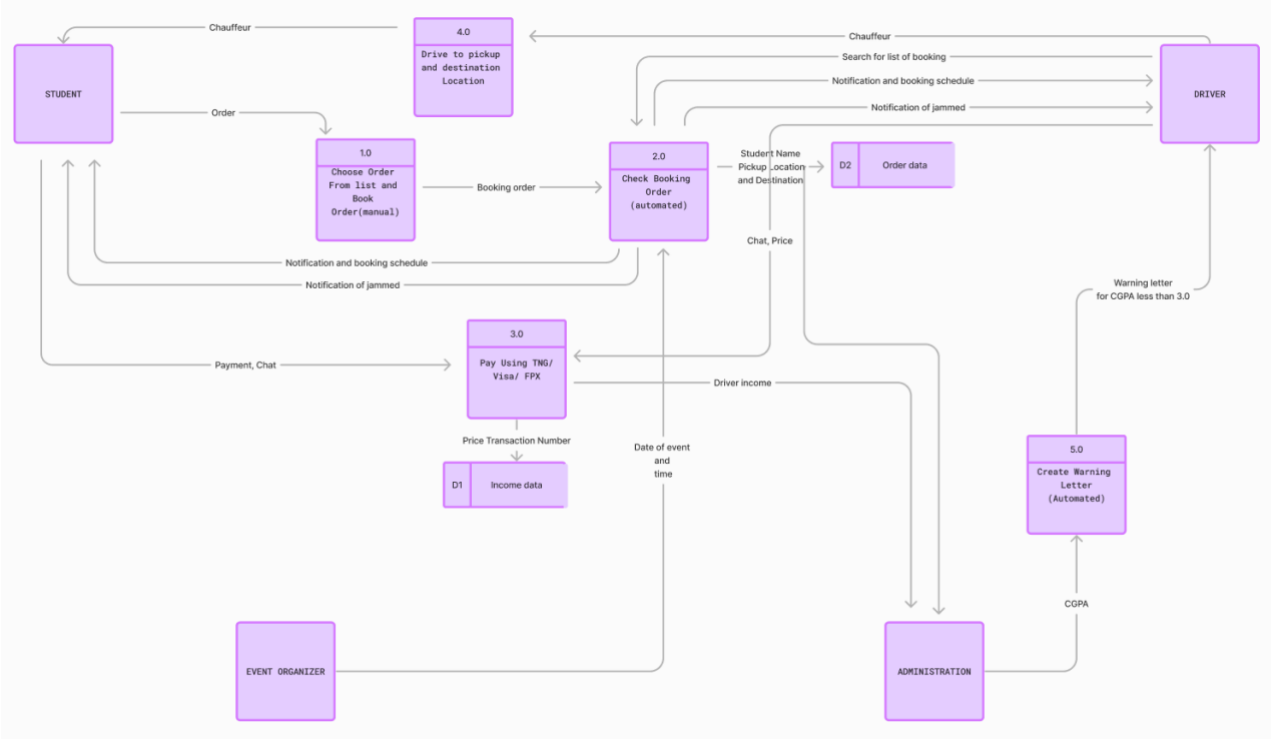
    Create Warning letter

    Display Warning letter

7.0 PHYSICAL SYSTEM DESIGN

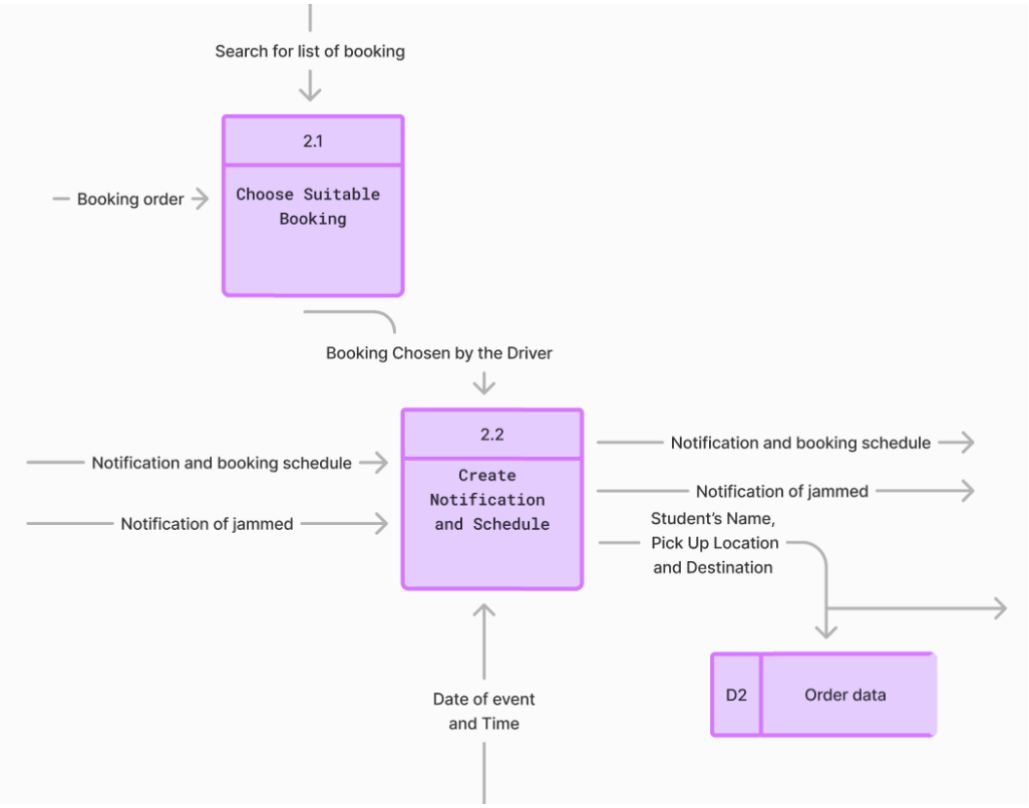
7.1 Physical DFD TO-BE system

7.1.1 Diagram Zero

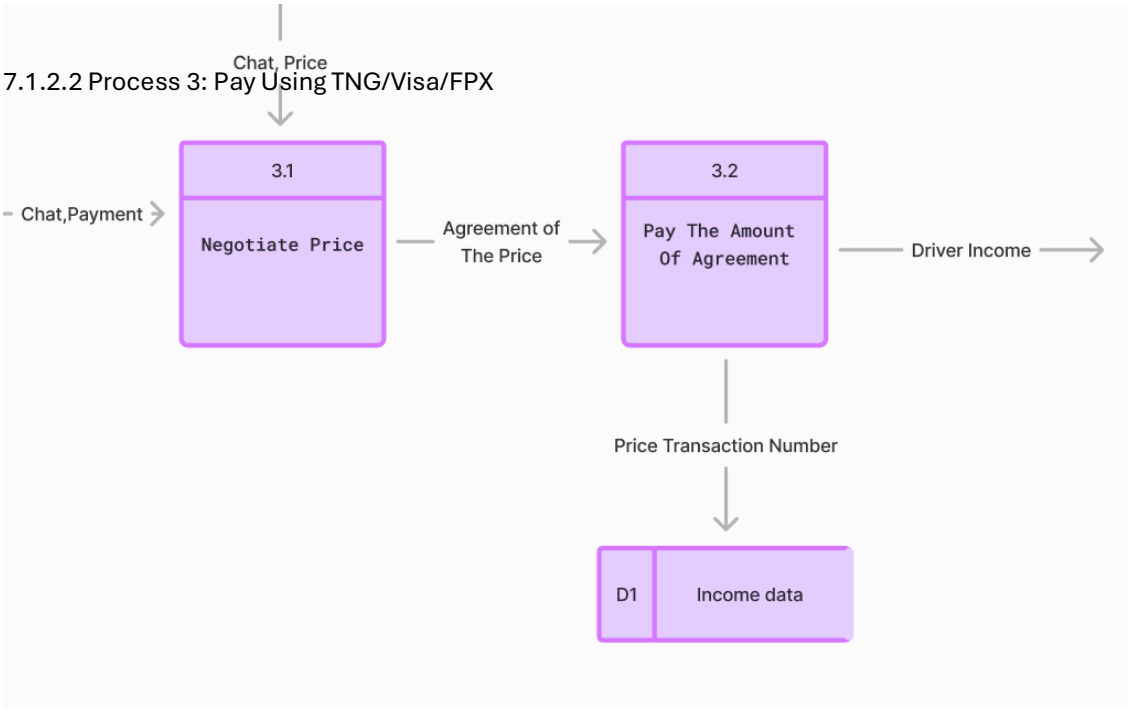


7.1.2 Diagram Zero

7.1.2.1 Process 2: Check Booking Order

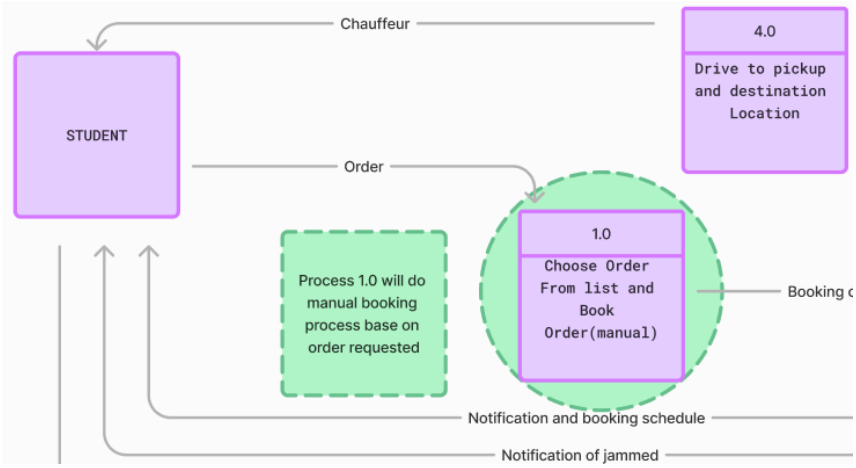


7.1.2.2 Process 3: Pay Using TNG/Visa/FPX

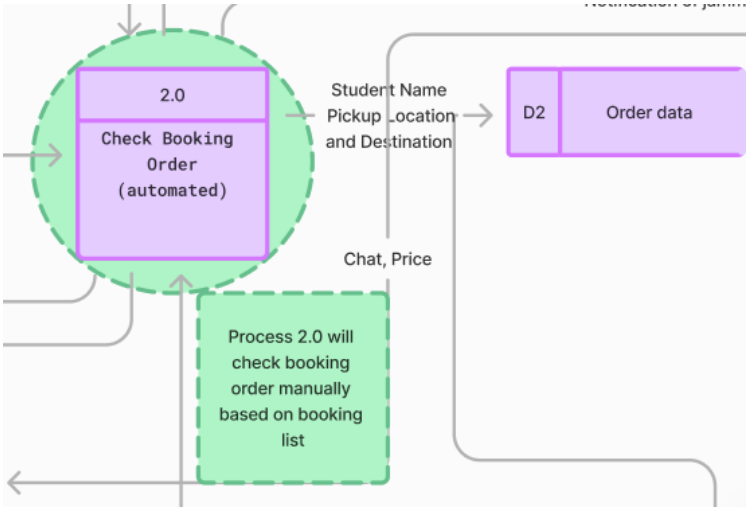


7.1.3 Partitioning

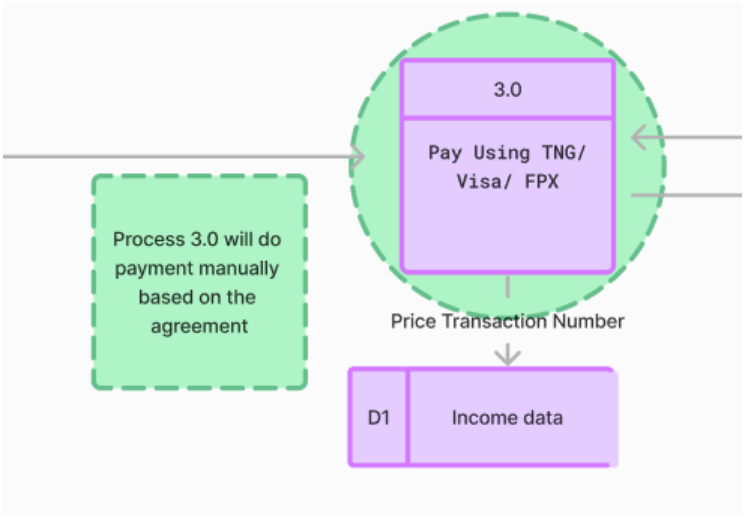
7.1.3.1 Process



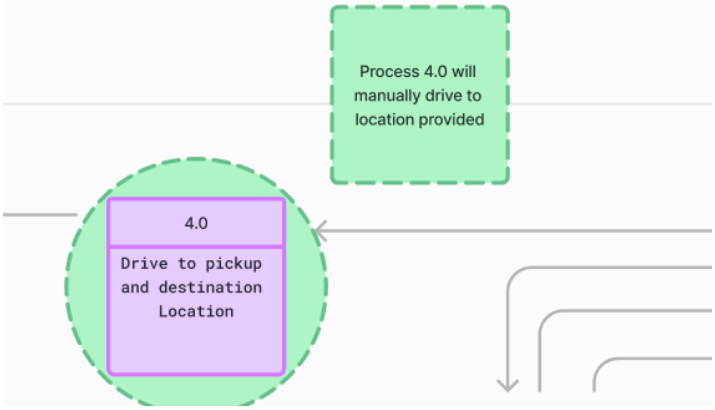
7.1.3.2 Process



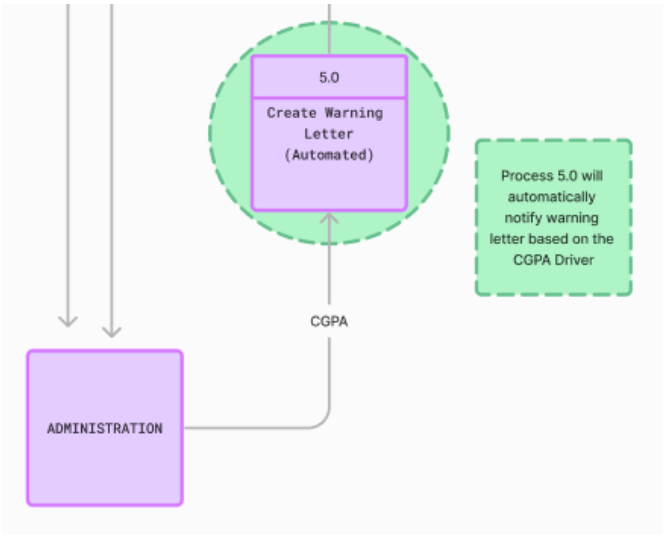
7.1.3.3 Process



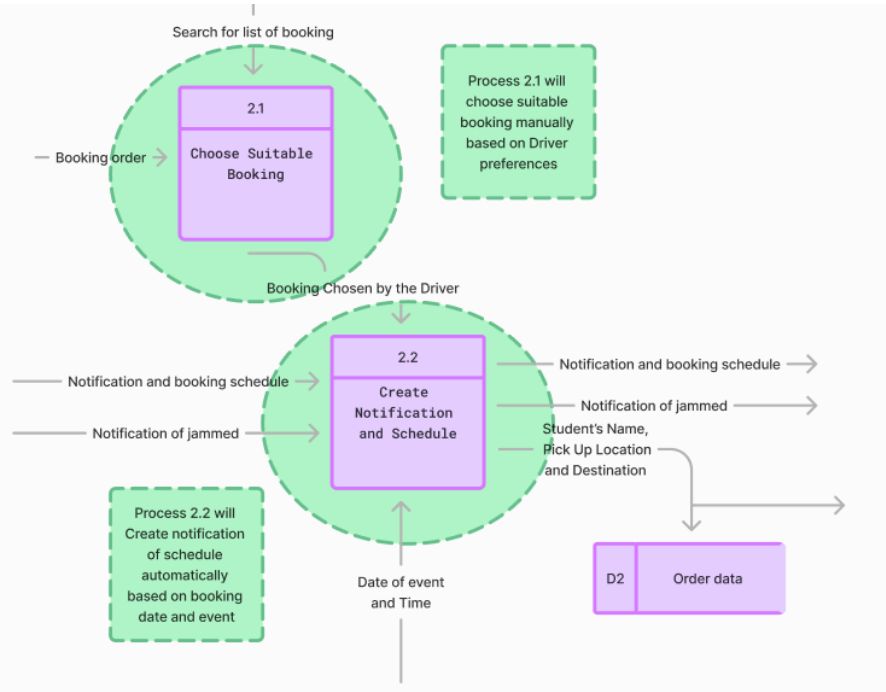
7.1.3.4 Process



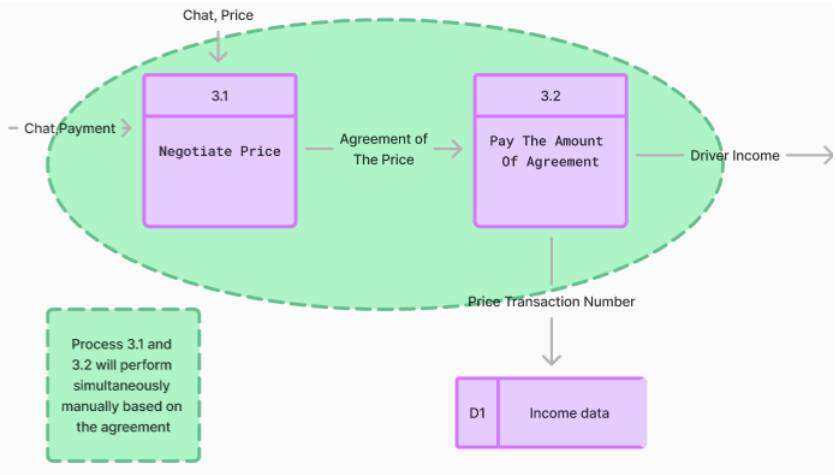
7.1.3.5 Process



7.1.3.6 Process



7.1.3.7 Process



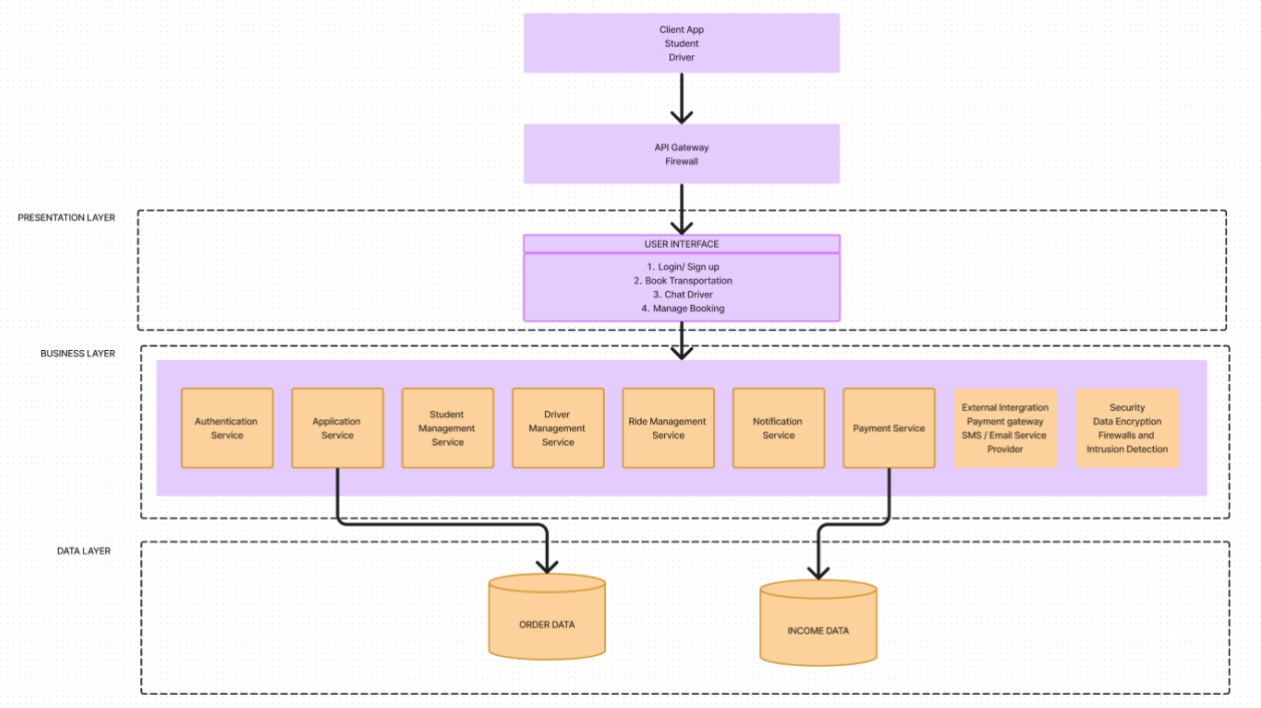
7.1.4 CRUD Matrix

ACTIVITY	Student	Driver	Event Organizer	Administration	Income Data	Order Data
Sign up/ Login	C	C				
Choose Order from List and Book Order	C					R
Check Booking Order	D	RU	U			R
Pay using TNG/ Visa / FPX	U	C		R	R	
Drive to Pickup and Destination Location	R	RU				R
Create Warning Letter		R		CU		

7.1.5 Event Response Table

Event	Source	Trigger	Activity	Response	Destination
Choose Order from List and Book Order	Student	Destination and Pickup Location	Create booking list	Booking order	Driver
Check Booking Order	Driver	Order Information and Booking List	Find booking list and order details. Send notification and booking schedule and notification of jammed	Ntification and booking schedule and notification of jammed	Student
Pay using TNG/Visa/FPX	Student	Agreement and Price	Store the transaction details in Income Data. Negotiate price and reach an agreement	Driver income	Driver, Administration
Drive to Pickup and Destination Location	Driver	Order Details	Drive to pickup student and proceed to the destination		Student
Create Warning letter	Administration	Driver Income and Driver Academic Record	Create and send warning letter based on academic record	Warning letter	Driver

7.1.6 Structure Chart



Video Link : -

https://drive.google.com/file/d/1_qxX_Jx6BfmhyieYCpyTTbq2T63VXcgb/view?usp=drive_link