

Exercise 1

1- To what category of event processing application does this use case belong?

Ans: The category of the event processing application should be "Dynamic operational behavior" as components of this system are sending or reacting events with other components of the system.

2- Who can be the stakeholders in this scenario?

Ans: In this scenario, the main stakeholders should be University, Student, and Municipal Utilities.

3- What can be the components of the target system?

Ans: The components can be System for Bus management, Live Bus information feed, Applications for Lectures management, Applications for students, Municipal utility service, and Live weather feed system.

4- What is the role of each component in the target system?

Ans:

- System for Bus management
 - Trip management
 - Send information to other systems
 - Receive information from other systems
- Live Bus information feed
 - Updating live bus location and passengers information
- Applications for Lectures management
 - Add/Edit lecture schedule
 - Store information such as lecture content, student attendance, etc.
- Applications for students
 - Can check the trip schedule and route.
 - Can check the lecture schedule and location
 - Give preference
- Municipal utility service
 - Update the available bus information.
 - Update the information about the traffic-free route.
- Live weather feed system.
 - Updating live weather feed like snowing, raining, and their forecast.

5- What are the messages exchanged between system components?

Ans:

- System for Bus management
 - Trip schedule and regarding bus information.
 - Send requests to municipal utilities for Bus.
 - Receive information from other systems.
- Live Bus information feed
 - Sending bus GPS location
 - Sending passengers information
- Applications for Lectures management
 - Send lecture times and location
 - Send information such as lecture content, student attendance, etc.
- Applications for students
 - Send student schedule.

- Send request for bus
- Receives upcoming trips information
- Municipal utility service
 - Send information about the available bus list.
 - Receive requests from the bus management system.
- Live weather feed system.
 - Send live weather information like snowing, raining, and their forecast.

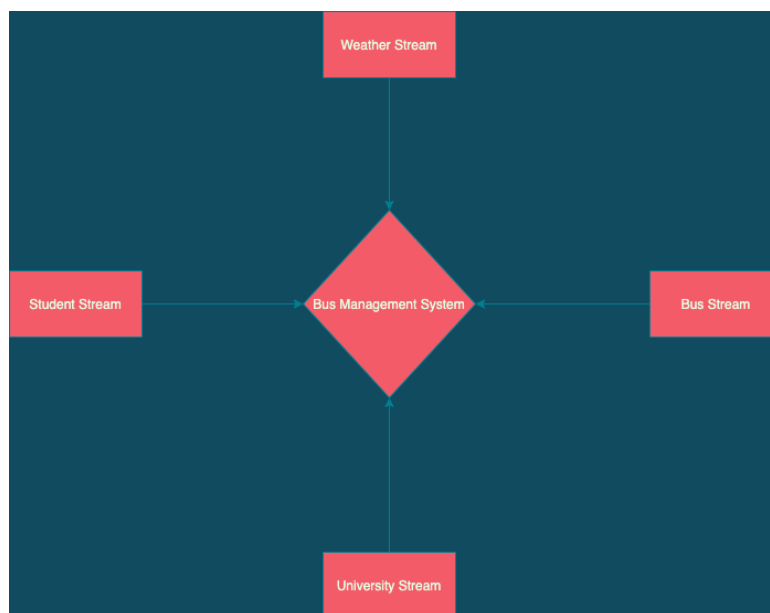
6- What is the information needed in each of the processes?

Ans:

- Information for Trip scheduling
 - Lectures schedules
 - Available bus list
 - Weather forecast
 - Trip requested by the student
 - Class attendance information
- Information for Trip cancellation
 - Limitation of the available bus for the scheduled trip
 - For canceling lecture
 - Students rejecting trips
- Information for computing the number of students on each trip:
 - The number of students who are boarding the bus
 - The number of students who are requesting a trip
 - The number of students who are going on the trip
 - The number of students attending the lectures
 - Student ratio in good weather and bad weather.

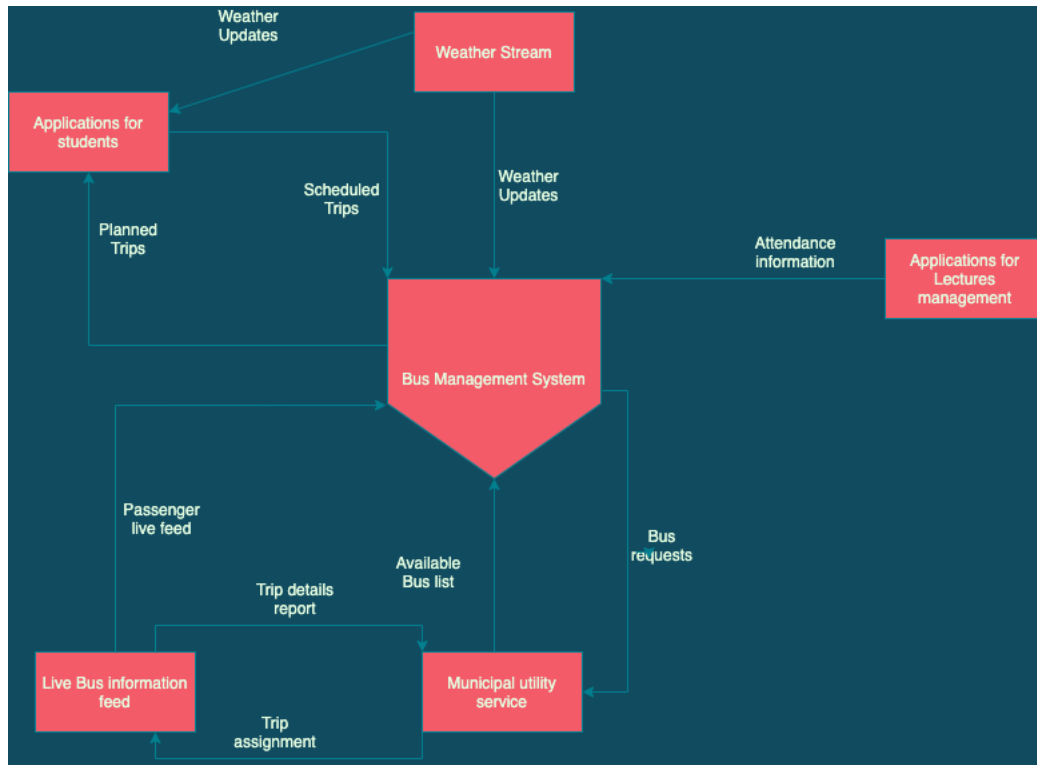
7- In terms of data streams, what are the data streams processed by the system?

Ans: In this system, mainly four streams are processed by the system. The four streams are student stream, university stream, bus stream, and weather stream.



8- Draw a simple chart that illustrates the architecture of the system, and the flow of the different data streams between the different components in the system (similar to the Fast Flower Delivery overview)

Ans: The diagram is given below:

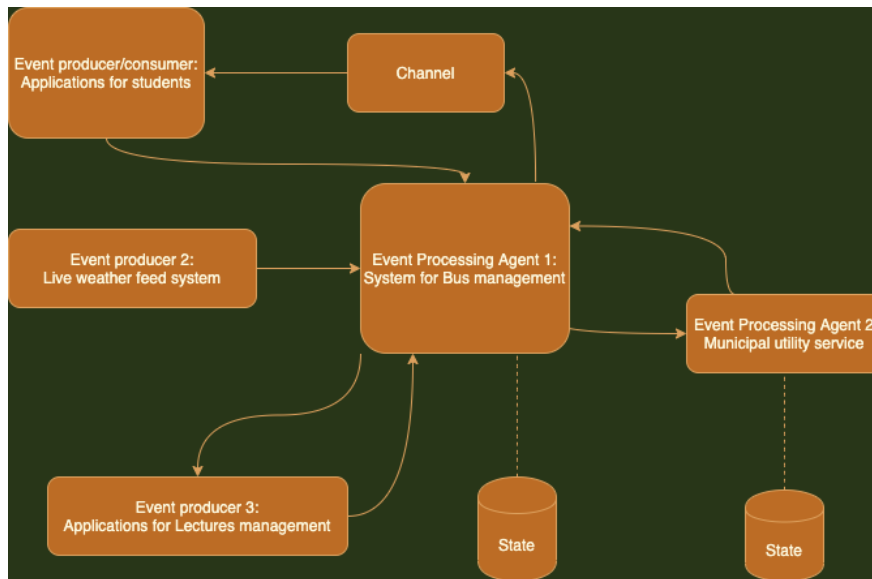


9- In the application, which components act as event producers, consumers, or both? Draw a simplified event processing network for the application.

Ans:

- Components act as an event producer and consumer.
 - System for Bus management
 - Live Bus information feed
 - Applications for students
 - Municipal utility service
- Components act as an event producer
 - Live weather feed system.
 - Applications for Lectures management

Drawing of a simplified event processing network for this application is given below:



10- Frequent system patterns

Ans:

Pattern type	Context	Relevant types	Parameters	Pattern Policies
Threshold pattern	Request one more bus in same time	Student	Request>120	Evaluation: Granted