**Lab 01: Introduction to System S1**

**Objective**

The objective of this lab is to select a system from real world/imagination and find out the problems and suggest how these problems can be solved using IT knowledge.

**Lab Learning Outcomes (LLO)**

By completion of the lab the students should be able to

1. Choosing a Problem
2. Specific IT Problem and brief solution

**Lab Requirements**

Tools: MS Office

**Lab Assessment**

One Continuous system S1 will be used throughout the duration of the semester.

**Task to Do:**

Assignment Instructions:

**Problem Description** (Approximately 250 words):

Begin by providing a concise yet comprehensive description of the precise problem you have identified. Clearly articulate the challenges, inefficiencies, or limitations that the system currently faces. Emphasize the significance of addressing this problem within the context of the system's operation.

**Suggested Solution** (Approximately 250 words):

Present a well-structured solution statement that addresses the identified problem. Elaborate on how your proposed solution will resolve the existing issues and contribute to the overall improvement of the system. Your solution should be innovative, feasible, and aligned with the scope of the system.

**Architectural Diagram:**

Accompany your solution statement with an architectural diagram that provides a visual representation of your proposed solution. This diagram should elucidate the key components, interactions, and flow of data within the system. Use clear symbols and annotations to effectively communicate the architectural design.

Following is a sample of a solution.

**Example/Problem:**

**Title:**

"Traffic Violation Monitoring System"

**Problem Description:**

Traffic violations are a major cause of accidents and congestion in the city. Traffic violations occur when drivers do not follow the traffic rules and regulations that are designed to ensure their safety and the smooth flow of traffic. Some common traffic violations are:

• Over speeding

• Running red lights

• Changing lanes abruptly or without indicators

• Not wearing seat belts

• Driving erratically or zig-zagging

• Stopping beyond the stop line at red lights

The aim of this problem is to design a system that can monitor the traffic, detect and identify the violations, and communicate with the drivers or the vehicle owners.

**Suggested Solution:**

The system should be user-friendly and meet the needs of the traffic police officers who are the main users of the system. The system should have the following features:

• Data acquisition: The system should use cameras or sensors that are installed at strategic locations on the roads, such as intersections, highways, U-turns, or roundabouts. The system should be able to capture images or videos of the traffic and collect relevant data, such as vehicle number plates, speed, direction, etc.

• Data processing: The system should analyze the data and compare it with the traffic rules and regulations. The system should be able to detect and classify the violations and assign them a severity level.

• Data verification: The system should allow the traffic police officers to review and confirm the violations before taking any action. The system should also provide evidence of the violations, such as images or videos, to support the verification process.

• Data communication: The system should send notifications to the drivers or the vehicle owners about their violations and direct them to pay the penalty online. The system should also provide them with an option to view their violations and submit a dispute if they disagree with the system's decision.

• Data management: The system should store and update the data in a secure database. The system should also manage the drivers' profiles and reward them with gift points if they drive safely and follow the traffic rules for a certain period of time. This feature could encourage positive driving behavior and reduce traffic violations in the future.

To design this system, it is recommended to conduct interviews or surveys with the traffic police officers to understand the real requirements and expectations. Alternatively, you can visit the government website for the 'Sahar' system to get some insights into how they operate or what features/services they offer.

**Diagram**

Students are required to draw an architectural diagram for the above problem and solution to illustrate the components, data flow, and interactions of the traffic violation system. They may use symbols to show the system components. Please note that the architectural diagram should represent the key components mentioned in the suggested solution and capture the flow of data and interactions between these components.

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There are several other ideas that students may choose for system S2.

1. Tourism industry (Travelers Management system)
2. **Vehicle Parking system**
3. **Traffic Monitoring system**
4. COVID19 patient Management system
5. Traffic Lights Management System
6. Surveillance of people
7. Crowd Management system
8. Spare parts (Automobile) management system
9. Entertainment industry (Movies, game development, joylands)
10. Media Streaming platforms
11. Food Industry (Delivery, Restaurants)
12. Sports Management system
13. Medicine industry
14. Account Management systems (Banking sector, loan management system)
15. Security system (Network security)
16. Garments/Clothing Industry (inventory Management system)
17. Reservation System (Flight reservation system, hotel room reservation management system)
18. Social media
19. Classroom Management system
20. Agriculture Industry (Smart Tracking, Crops Management system )
21. Real estate industry
22. Rental Management system
23. Weapons Management System
24. Metal Industry