Autonomous Intersection Management System

Project Plans

Team Protocol Pros

Section 1: Team Members

1. Ashutosh Mishra
2. Prakash Acharya
3. Sarah Ryan
4. Brendan Edgerley
5. Julian Villarreal
6. Amado Lazo
7. David Schelanko

Section 2: Project Implementation Model

Based on the project idea, structure and team division, we found out that the **'Iterative Waterfall Model'** would be the most pertinent and effective.

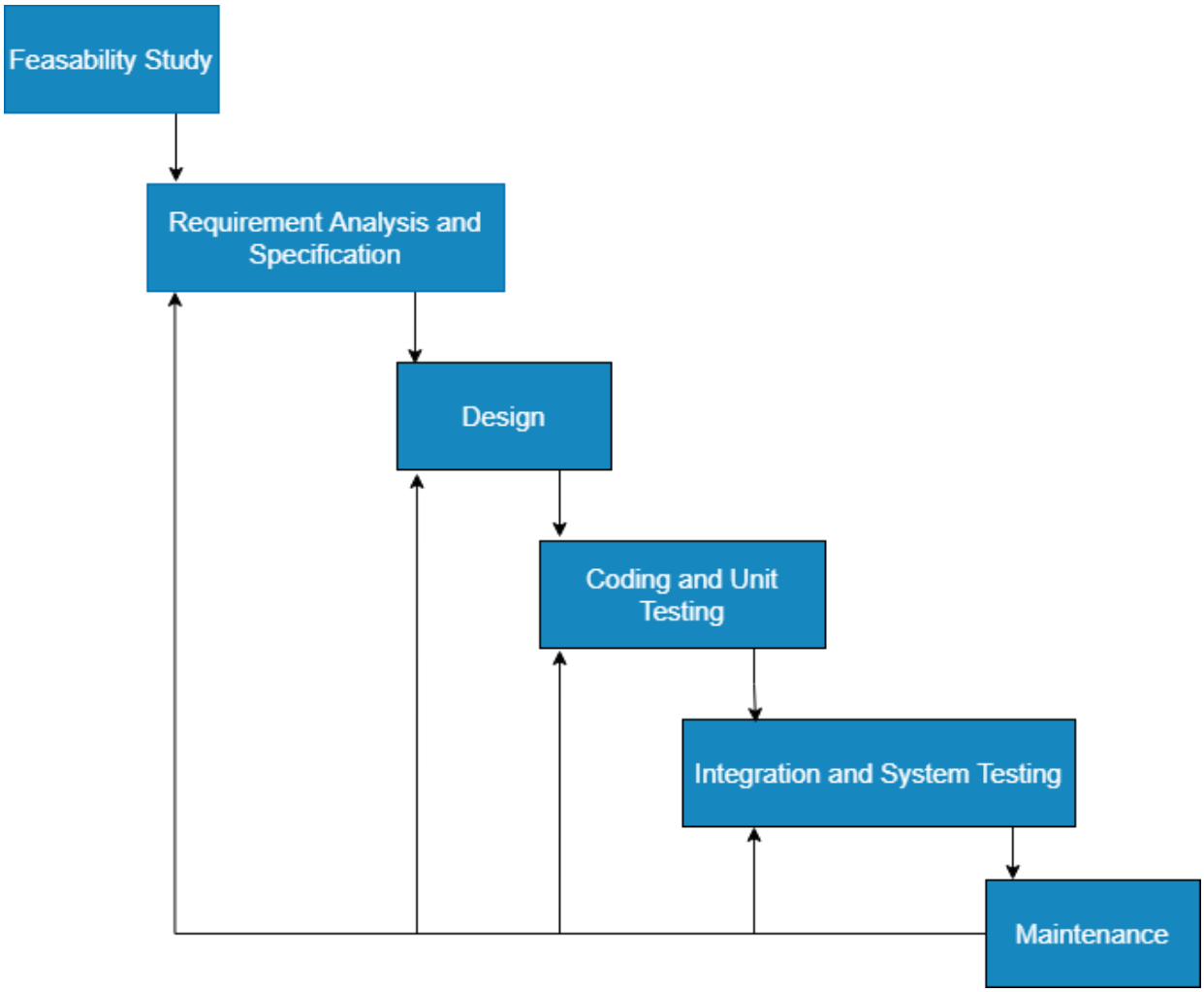

Fig: Iterative Waterfall Model

Section 3: Project Phases

Our project would have a total of 6 phases, each of which run sequentially. Few stages can run parallelly in order to inspect the incomplete tasks of the trailing phase.

1. Feasibility study
   - Analyzing which features are viable to implement.
   - Cite out the feasible aspects of the project.
2. Requirement Analysis and Specifications
   - Figure out requirements of the problem statement through overall analysis of the domain.
   - Analyze and specify requirements and cluster them distinctly.
3. Design
   - Figure out proper design methodologies of implementing the solution based on requirements.
   - Use the design methodologies and prepare a design draft of the final solution.
4. Coding and Unit Testing
   - Analyze better ways of implementing the solution.
   - Code and perform unit testing in the local environment.
5. Integration and System Testing
   - List out relevant test cases for the entire system.
   - Perform testing against each of the test cases available.
6. Maintenance
   - While presenting, exploring, and fiddling in the system, if any issue occurs, the life cycle shall repeat itself.

Section 4: Project Timeline and roles

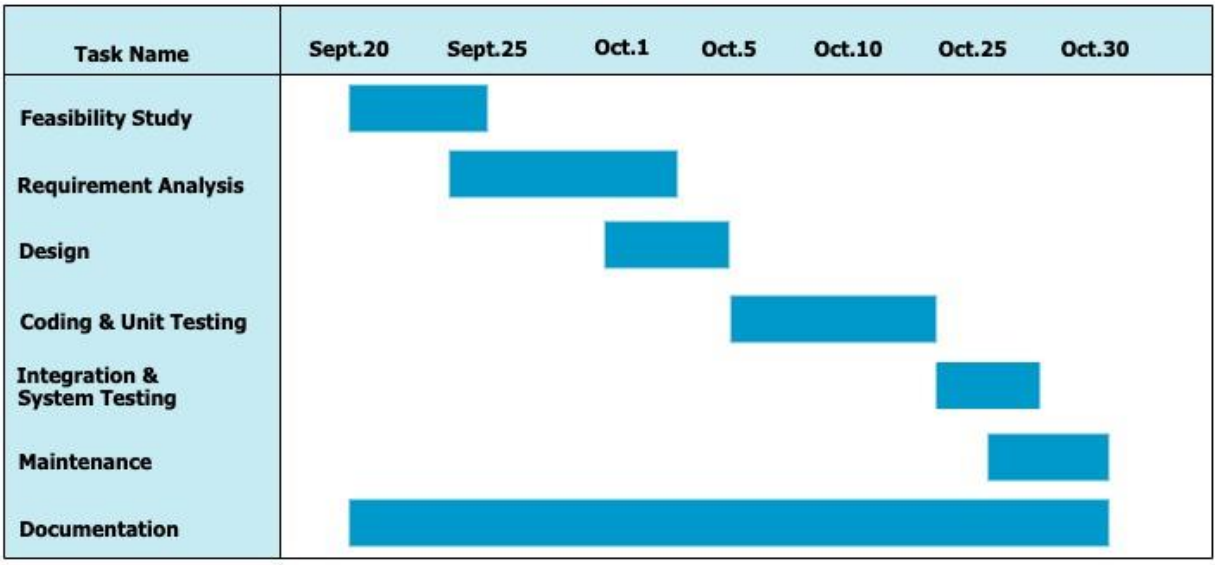

Fig: Rough estimate of the timeline of each stage of the project

Project Roles

Project Manager	1. Ashutosh Mishra 2. Amado Lazo
Technical Manager	1. Prakash Acharya 2. Sarah Ryan
Researcher	1. Julian Villarreal 2. David Schelanko 3. Amazo Lazo
Designer	1. Brendan Edgerley 2. Julian Villarreal
Developer	1. Ashutosh Mishra 2. Brendan Edgerley 3. David Schelanko
Tester	1. Sarah Ryan 2. Prakash Acharya

Section 5: Tasks in project (Based on current understanding of the problem)

1. Setup Video Streaming Protocol for receiving video stream from intersection. Ensure low-latency and high reliability.

2. Setup UDP based protocol for agents to communicate their instructions manually, especially for Emergency vehicles.

3. Integrate the pre-trained OCR model process the video (identify vehicles thru license plates, and register their intentions in the intersection), may be trivial in our project.

4. Define the hash function for SHA-2 within the HMAC authentication for Intersection-to-Agent communication.

5. Setup HMAC authentication for generating the 1024 / 512/ 256 bytes message digest / instructions from AIMS to agent.

6. Setup connection-oriented protocol for transmitting the instruction (HMAC generated message digest) from AIMS to agent.

7. Setup SHA-2 logic for transmitting intersection status from AIMS to Smart City system.

8. Setup protocol for intercommunication between AIMS and Smart City System.

9. Develop algorithm for prioritizing emergency vehicles in the intersection.