Group name: Subway Surfers
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Week: 3
Objective: Make an outline of the project scobe

Indetifying the problem:
A train management system is needed for many reasons. Some of the causes that lead to the creation of a train management system are lack of information, communication and coordination issues, safety concerns etc. Without such a system, the risk of accidents, delays, and other problems would be much higher.

Project objectives:
1. *Safety:* This is also the primary goal of a train management system. This includes minimizing the risks of accidents, ensuring compliance with safety regulations.
2. *Efficiency:* The management system's aim is to optimize train operations, ensuring that trains run on time, reduce journey and time costs and maximize the use of resources such as train, tracks and personnel.
3. *Reliablity:* the aim to provide a reliable service to   customers, minimizing delays, cancellations, and other disruptions.
4. *Customer Statisfaction:* A train management system should aim to provide a high-quality service to customers, ensuring that they have a positive experience when   using the railway network.
5. *Sustainability:* aim to minimize the environmental impact of train operations, for example, by reducing energy consumption and greenhouse gas emissions.
6. *Cost- effectivenes:* aim to provide a cost-effective service, maximizing revenue and minimizing costs without compromising safety, reliability, or customer satisfaction

Project deliverables:
1. *System Requirements Specification:* we will provide the functional and non functional requirements of this management system.
2. *System Design:* this management system will be designed usign raw PHP and MySQL for the database
3. *Train Control and Monitoring Software:* this is the core component where we will create different classes in order that these classes will corporate with each other so it can track train moves, manage schedules, employees etc.
4. Reporting and Analytics: A train management system often includes reporting and analytics capabilities to generate performance reports, analyze data trends, and identify areas for improvement. This will include dashboards, data visualization tools, and analytics algorithms.

5. User Interface and Training Materials: A user-friendly interface is essential for the effective use of the train management system. The project may involve designing and developing a user interface that is intuitive, easy to navigate, and provides access to relevant information.
6. Documentation: Proper documentation is essential for the maintenance, support, and future enhancements of the train management system. The project will include the creation of system documentation, including different diagrams, functionalities, user cases etc.

Project Stakeholders:
The stakeholders of this projects are the individuals or groups who have an interest in the involment of this project. In our case this includes: train drivers and crew(employees), passengers, the admin or manager of the company, IT and technical staff (us), suppliers and vendors etc.

Features and functionalities:
1. *Train tracking:* The system should be able to track the location, speed, and status of trains in real-time using GPS, radio frequency identification (RFID) technology, or other methods.
2. *Schedule management:* The system should be able to manage train schedules, including setting departure and arrival times, determining routes, and handling conflicts or disruptions.
3. *Crew management:* The system should be able to manage the crew members responsible for operating and maintaining the trains, including scheduling, tracking, and communicating with them.
4. *Resource allocation:* The system should be able to allocate resources such as trains, tracks, and personnel to ensure that they are being used efficiently and effectively.
5. *Safety management:* The system should be able to monitor and manage safety protocols, including enforcing speed limits, detecting and preventing collisions, and managing emergencies.
6. *Communication:* The system should be able to facilitate communication between stakeholders, including train operators, dispatchers, maintenance personnel, and customer service representatives.
7. *Analytics and reporting:* The system should be able to collect and analyze data on train operations, safety, customer satisfaction, and other metrics to inform decision-making and improve performance.
8. *Integration:* The system should be able to integrate with other systems such as ticketing, scheduling, and maintenance management systems to ensure that data is shared seamlessly across the railway network.

Project boundaries:
One of the project boundaries that we could have is the fact that our country at the moment doesn't have a railway system. So to do this project we have to make efficient research to learn how the system will work. Saying this one of the boundaries that can also be seen is the lack of information about the train operation. Since this is a project that will be submitted as a group work the timeline of the work might also be a problem as we have less then 13 weeks to work with this project and there is a lot of work to be done.

Project Assumptions:
Implicit beliefs or conditions that are taken for granted or accepted as true, but are not yet proven or validated. Assumptions have an impact on project planning and decision-making, and they should be documented to ensure clarity and alignment.

1. *Technical Expertise:* we need the necessary information of using the PHP language and SQL for the database management.
2. *Compatibility:* The project assumes that the train management system will be compatible with the existing IT infrastructure and systems within the railway organization. This includes integration with other relevant systems, such as ticketing systems, signaling systems, and maintenance management systems.
3. *Database Design:* the project team will design an appropriate database schema using SQL to store and manage the train management system's data. The assumptions may include defining the necessary tables, relationships, and data models to support the system's functionality.
4. *Security Measures:* The project assumes that appropriate security measures will be implemented to protect the train management system and its data from unauthorized access, data breaches, and other security threats. This may include encryption, user authentication, role-based access controls, and secure communication protocols.
5. *User Interface Design:* assumed that the project team will design a user-friendly interface for the train management system using PHP. The assumptions may include considerations for usability, accessibility, and responsiveness to ensure a positive user experience.
6. *Data Availability:* The project assumes that the necessary data, such as train schedules, resource availability, and real-time information, will be available from reliable sources to populate and update the train management system's database
7. *Regulatory Compliance:* It is assumed that the train management system will be developed in compliance with relevant regulatory requirements and standards specific to the railway industry. The assumptions may include adherence to safety regulations, signaling protocols, and data privacy regulations.

Project risks:

Potential events or circumstances that may have a negative impact on the project. Here we can mention the *Technical Risks* such as *Inadequate Scalability* where the system may struggle to handle a large volume of train operations, resulting in performance issues and system slowdowns and *Integration Challenges* where integrating the train management system with existing systems, such as ticketing or signaling systems, may pose technical difficulties and lead to data inconsistencies or communication failures. We can also mention *Security Vulnerabilities:* where insufficient security measures in the system design and implementation could expose sensitive data to unauthorized access or cyberattacks.

Another risk to be taken in consideration are *Data Risks* where we can mention *Inaccurate or Incomplete Data:* since the train management system relies on accurate and timely data to make informed decisions. If the data sources are unreliable or incomplete, it can lead to incorrect scheduling, resource allocation, or disruptions in train operations; and *Data Corruption:* where there is a risk of data corruption or loss due to technical issues, system failures, or human errors during data management, which could impact the system's reliability and functionality.