

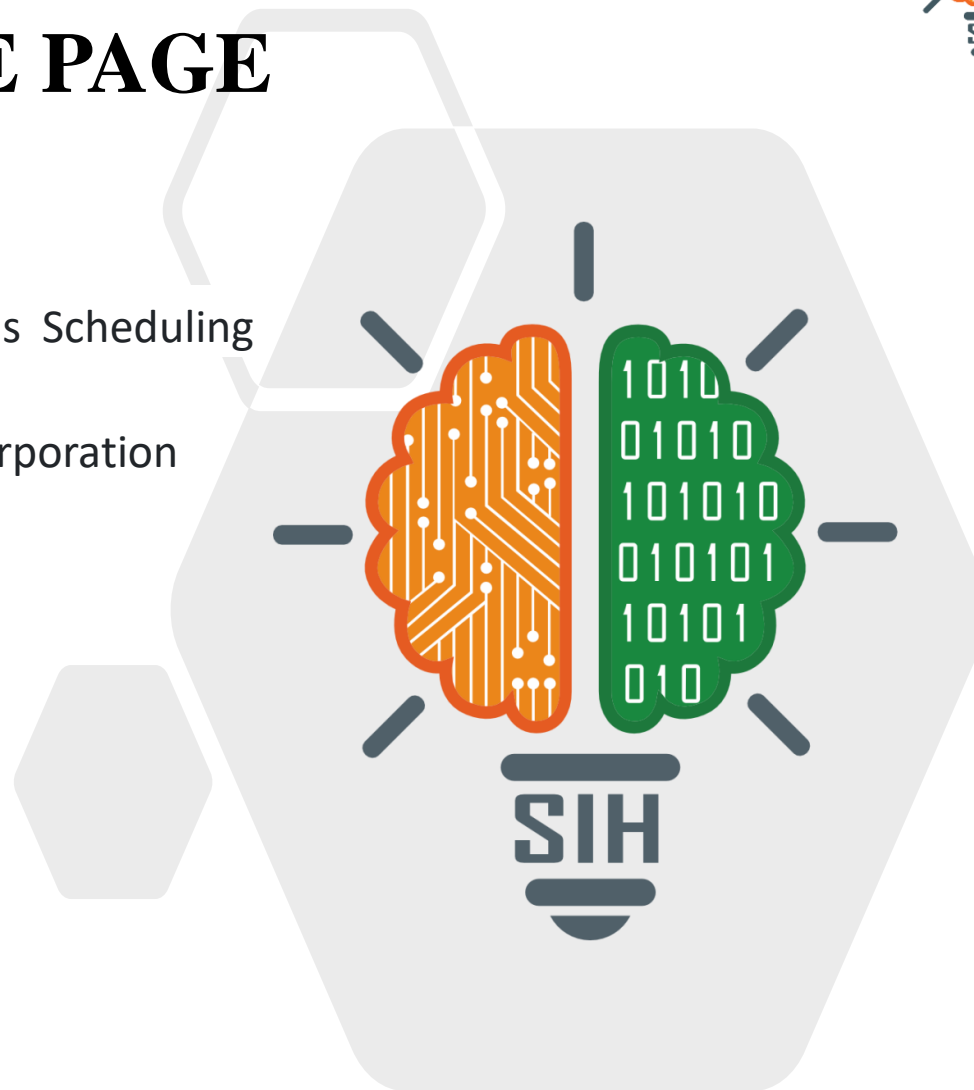
SMART INDIA HACKATHON 2024



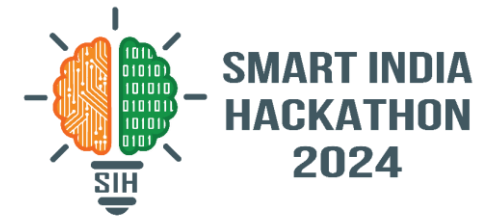
SMART INDIA
HACKATHON
2024

TITLE PAGE

- **Problem Statement ID** – SIH1612
- **Problem Statement Title**-Automated Bus Scheduling and Route Management System for Delhi Transport Corporation
- **Theme**- Smart Vehicles
- **PS Category**- Software
- **Team ID**- NA
- **Team Name** - JSR



IDEA / APPROACH DETAILS



❖ KEY OBJECTIVE :

- Automate bus scheduling to reduce human power.
- Create a database system that stores which bus will be given to which crew and at what time and their estimated route time .
- Some rest time will be allotted to each crew after each shift.
- Avoid bus overlaps by creating a website which tracks real time location of all busses.
- Create a interface that uses Delhi maps and GPS of busses to track their location and the screen will turn red in color if two busses on the same route are in a range of 1000 meters to each other to reduce traffic and bus overlaps.

Process Flow:

Technologies:

- Frontend – Html, css , java script
- Backend- nodejs , express js
- Database – MySql

Methodology:

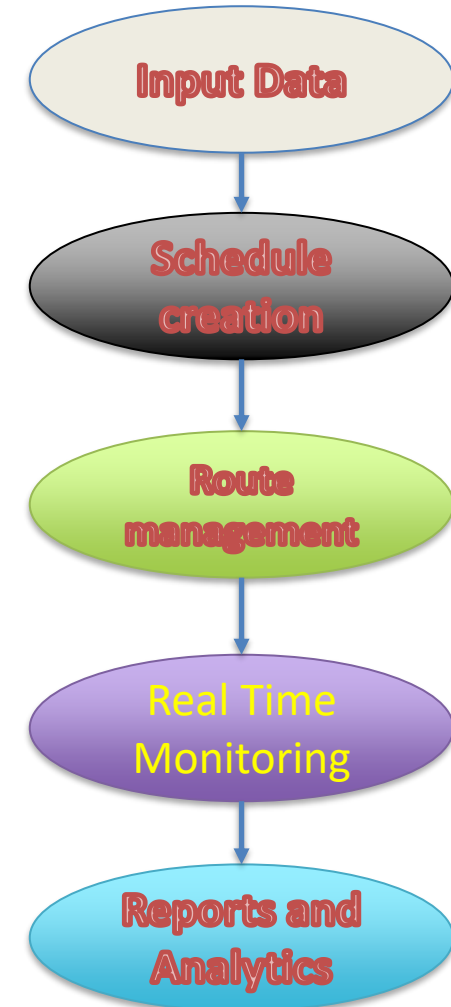
1.Understand the Problem:

1. The current system is manual, slow, and error-prone.
2. We need to automate bus scheduling and improve route planning to make things smoother for DTC.

2.Design the System:

1.User Dashboard: Create a central place where DTC staff can see everything they need—like bus schedules, crew assignments, and route maps.

2.Interactive Map: Build a feature that allows staff to draw and view bus routes on a map, highlighting any overlaps or issues automatically.



Feasibility Analysis

1. Technical Feasibility

- Algorithm Complexity:** Developing efficient algorithms for scheduling and route optimization requires advanced understanding of optimization techniques and algorithm design. Ensuring these algorithms run efficiently with large datasets is crucial.
- GIS Integration:** Integrating GIS for route mapping and visualization can be complex, requiring expertise in GIS technologies and spatial data handling.

2. Financial Feasibility

- Cost of Development:** Developing and deploying the system may require significant investment in software development, GIS tools, and training. Budget planning and cost management will be key.
- Return on Investment (ROI):** Estimating the potential savings from improved scheduling and route management will help justify the investment.

Potential Challenges and Risks

Operational Risks:

- Resistance to Change:** Staff may resist adopting the new system, affecting its implementation and efficiency.
- Data Integration:** Challenges in integrating data from existing systems and ensuring consistency and accuracy.

Strategies for Overcoming Challenges

Technical Strategies:

- Prototype and Testing:** Develop a prototype and conduct extensive testing to identify performance issues early. Optimize algorithms for efficiency and scalability.
- GIS Expertise:** Collaborate with GIS experts to ensure effective integration and accurate mapping.

IMPACTS:

Bus Operators and Crew Members:

- **Improved Efficiency:** Streamlined scheduling and route management can reduce downtime and improve overall operational efficiency.
- **Better Work Conditions:** Automated systems can help ensure fair distribution of duties and manageable shifts, reducing stress and fatigue for bus crews.

Delhi Transport Corporation (DTC):

- **Cost Savings:** Efficient scheduling and route management can reduce operational costs, such as fuel consumption and maintenance expenses.

BENEFITS:

Environmental Benefits:

- **Reduced Emissions:** Optimized routes and scheduling can lead to more efficient bus operations, reducing fuel consumption and greenhouse gas emissions.
- **Sustainable Transportation:** Improved public transport services can encourage more people to use buses rather than personal vehicles, contributing to a reduction in traffic congestion and environmental impact.

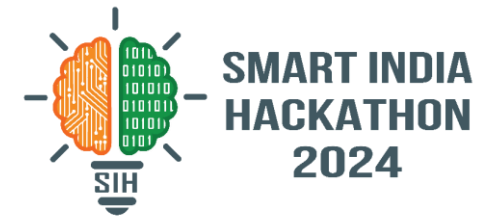
Economic Benefits:

- **Cost Reduction:** Efficient scheduling and route management can lower operational costs for DTC, leading to potential savings.

- **"Bus Scheduling and Operations Management"** - This book provides comprehensive coverage of bus scheduling techniques and operations management strategies
(<https://link.springer.com/book/9780367332646>)
- **"GIS for Transportation: Principles and Applications"** - Explores the application of GIS in transportation planning and management.
(<https://www.wiley.com/enus/GIS+for+Transportation%3A+Principles+and+Applications-p-9780470406550>)

(And various other information from various websites)

IMPORTANT INSTRUCTIONS



Please ensure below pointers are met while submitting the Idea PPT:

1. Kindly keep the maximum slides limit up to six **(6)**. (Including the title slide)
2. Try to avoid paragraphs and post your idea in points /diagrams / Infographics /pictures
3. Keep your explanation precise and easy to understand
4. Idea should be unique and novel.
5. You can only use provided template for making the PPT without changing the idea details pointers (mentioned in previous slides).
6. You need to save the file in PDF and upload the same on portal. No PPT, Word Doc or any other format will be supported.

Note - You can delete this slide (Important Pointers) when you upload the details of your idea on SIH portal.