Public Transport Optimization Through Data-Driven Scheduling

Visit and Problem Identification

Field Visit

As a group, we went around the local market and food stalls that have pedestrian and public transportation impact. We studied the patterns of public transport, talked to the local population and took pictures of the place. This gave some understanding of the practical aspects of the usage of city public transport by the people.

Problem Identification

During the conduct, we were able to pinpoint the following major difficulties caused to commuters:

- Accessibility: There were scatted bus stops that were a challenge to access.

- Affordability: Bus trips were fairly cheap although people ended up paying extra aggravating the passengers when their bus had no further price climb than already paid of the costs.
- Convenience: The main problem was that buses, metros and LRTs did not adhere to timetables. Travelers would ensure that they always are at a bus terminal only to discover they may wait hours without knowing when any bus will come.
- Overall wellbeing: Coaches were always filled with people and did not have any air circulating especially when it was hot and this was uncomfortable. Some other passengers, mostly the old or disabled, had a pool experience.

Analysis and Selection

Problems Faced by People

We looked for the causes of these problems and assessed them according to their frequency and repercussions on the society as follows:

- The most frequent complaint involved irregular bus routes and non-friendly real time information -this problem affected every group particularly the rush hour travellers.
- Feeble occurrence of buses, metros and LRTs primary in the morning and evening hours, temperatures fluctuations paved the way for congestion and waiting periods which were frustrating.
- Causes of sanguine energy included congestion which potentially led to bus falls and heat stroke in the warm months.

Problem Selection

Following intense debates, we chose public transport timetable coordination as a core problem to address. It is a problem that affected the lives of the commuters on a daily basis by decreasing ease and well-being. Furthermore, better coordination of bus timetables can yield improved efficiency of public transport for a considerable duration in the future.

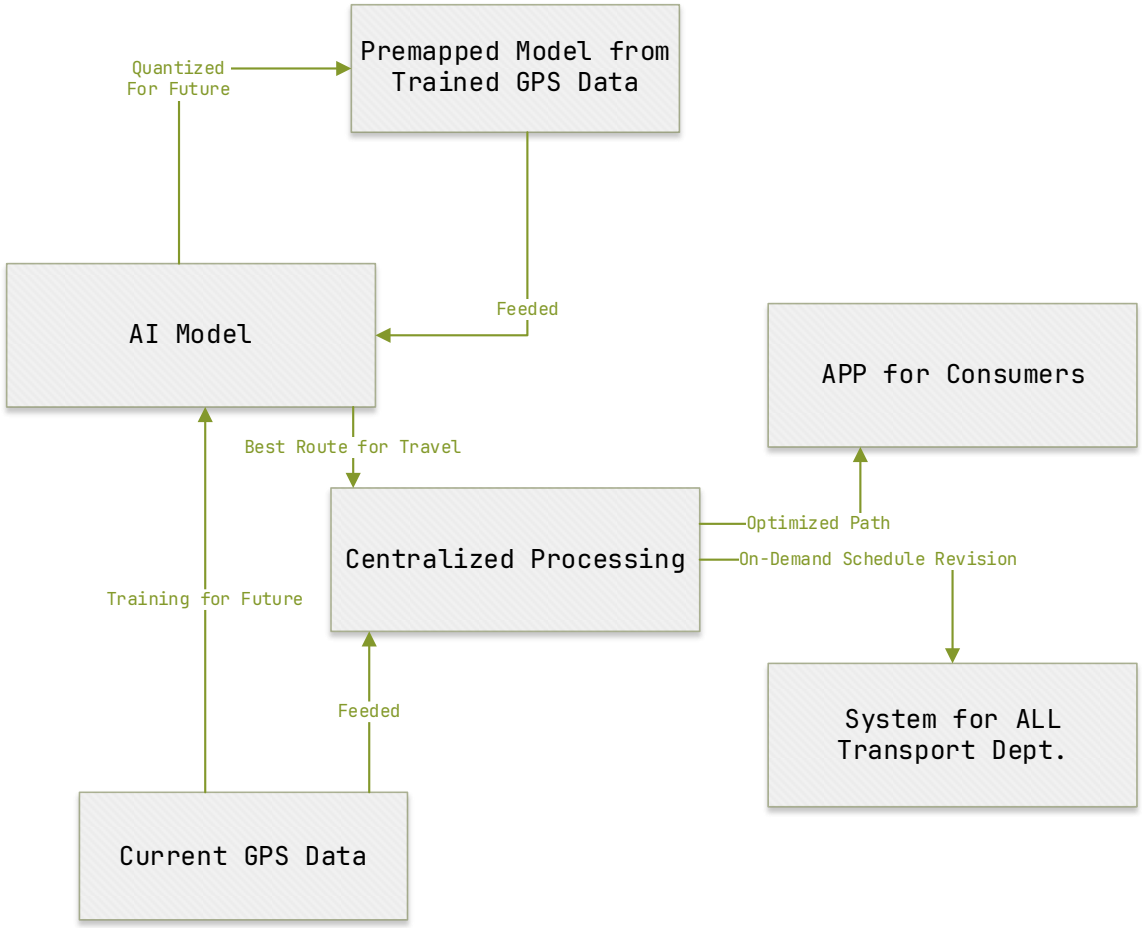
Solution Design

The Solution

In order to address this issue, we propose a novel approach of using available data in developing a public transport scheduling system that makes use of real time data analytics in bus scheduling and routing. This solution consists of:

- Real-time tracking: Passengers will be able to view their buses, metros and LRTs' location in real time through the mobile applications as the buses, metros and LRTs will have GPS on board.
- Dynamic Scheduling: Changes will be made to the scheduled times of buses, metros and LRTs by taking into account information on the number of passengers who have traveled during peak hours and existing road traffic.
- Passenger Notifications: The mobile application and SMS will alert passengers regarding when the particular transport will arrive, if any transport will be late or if there are alternative routes available.
- Crowd Management: The application will also contain a description of the degree to which the passengers will be able to avoid crowded buses, metros and LRTs by planning their trips well.

Concept Sketch



The schematic concept is structured as follows:

- Collecting Data: Global Positioning System (GPS) devices fitted in the buses, metros and LRTs send location and speed data in real time.
- Processing data: A central computer synthesizes this information, along with past travel patterns, in order to change the bus schedules on the fly.
- User Interface: The application provides a mobile device bus tracking application, bus route optimization, and bus schedule changes and delays alerts. In addition, a web-based application will enable city transport authorities to have better control over the buses, metros and LRTs fleet management.

Report Presentation

Overall Report Presentation

As can be observed, the report is very structured starting from the introduction to the field visit report and moving on to the basic problems confronting the members of the public. These problems are elaborated upon in detail and provide the justification for choosing the problem in focus, public transport scheduling. In developing the system's architecture, the design is complemented by relevant technical description and illustration. In the end, the advantages of the proposed system are discussed.

Writing Quality

The report is free from unnecessary details and employs language that is clear and precise". The report is organized in such a way that the arguments flow in a logical manner with proper linkage of the different parts. The tense, formatting style, accuracy of grammar and punctuations, and referencing were done properly including when it was necessary.