Development of a navigational algorithm with a rating system for commuters

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Team Introduction

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Problem Background

Problem

Transportation is one of the problems many Filipinos face day to day.

Problem

Traffic, however is a major hurdle for most Filipinos.

Problem

Daily transportation cost in 2012 was estimated to be Php 2.4 billion, including time cost.

Problem

Low-income families spent no less than 20% of their income for transportation.

Problem

One problem is that the large amount of private cars on the road can cause congestion.

Problem

Private cars were said to take up 78% of road space in 2012.

Problem

A way to mitigate this problem is to encourage people to commute.

Problem

Commuting, though, is complicated, which can intimidate those new to it. Safety is also another concern for commuters

Idea Concept

Idea

Create a navigational algorithm for commuters that implements a user-based rating system.

Approaches on Algorithmic Solution

Algorithmic Solution

For this problem we used a Dijkstra algorithm with slight modifications

Algorithmic Solution

Dijkstra is an algorithm used for finding the shortest path for a weighted graph.

Algorithmic Solution

We used a modified Dijkstra algorithm to find the shortest paths in terms of distance, fare, and travel time.

Algorithmic Solution

It was also used to find the path with the highest average rating.

Algorithmic Solution

In this version, paths with no ratings were avoided.

Algorithmic Solution

In all other versions, paths with ratings lower than a certain value were avoided.

Inputs and Data

Benefits and Social Impact

Benefits and Social Impact

There is already a navigational app that commuters can use to find their routes

Benefits and Social Impact

..however, it does not have an option for users to rate the routes that they have taken.

Benefits and Social Impact

This can be a problem as users won’t be able to know whether a certain route is safe to take or not.

Benefits and Social Impact

Ratings can also be a way to assess a route’s perceived quality, which in turn, can help in their improvement.

Code Demonstration

Thank you

References

Japan International Cooperation Agency (JICA) and National Economic Development Agency (NEDA) (2014). *Roadmap for Transport Infrastructure Development for Metro Manila and Its Surrounding Areas*. Retrieved from: https://libopac.jica.go.jp/images/report/12149597.pdf.