DEVELOPMENT OF AN EFFICIENT PUBLIC TRANSPORT SEARCH PORTAL FOR GHANA

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OVERVIEW

❶ Problem Definition

❷ Project Objectives

❸ Tools Used

❹ Methodology

❺ Results and Discussions

❻ Demonstration

❼ Conclusions and Recommendations

- Road transport is the major means of transportation in Ghana (Aidoo et al., 2013)

- Over 95% of all passenger and freight traffic and about 97% of all passenger miles in Ghana is by road (UNESCO, 2010)

- Privately owned or corporate taxis, *tro tros* (shared minivans), buses commuting between major cities (Abane, 2011)

- Difficulty in finding terminals specific location and detailed information

- Fares and stations keep changing

Figure 1: Kaneshie Transport Terminal

⋆ The transport industry is currently dominated by the informal sector which provides about 90% of transport services but their services are unreliable and uncomfortable Bonaventura (2015)

⋆ Individually or privately operated transport services are members of unions or associations. These unions and associations serve as regulatory and mouth-piece to each of their members (Fouracre et al., 1994)

⋆ To develop a web application that provides detailed
information about public transport routes in Ghana

$\star$ Python

$\star$ Django

$\star$ Material Kit

$\star$ PostgreSQL

$\star$ QGIS

$\star$ Leaflet and OpenStreetMap

$\star$ GPS receiver and Smartphone

∗ Review of related literature

∗ Conducting feasibility studies

∗ Requirements gathering and Analysis

∗ Functional and non-functional requirements

∗ Data Collection

- Neumann et al. (2015) have developed the
  first minibus supply model based on demand
  and street network only in South Africa;
  leading to Taximap: a public transport search
  web portal

Areas Considered:

- Technical feasibility.

- Resource feasibility.

- Operational feasibility.

- Schedule feasibility.

Answers to these questions must be provided to ensure that the system can thrive:

⋆ Where is the system going to be used?

⋆ Who is going to use the system?

⋆ What data should be input into the system?

⋆ What Software Development Life Cycle(SDLC) model to be used?

⋆ What type of output information will the system give?

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∗ Field survey
∗ OpenStreetMap
∗ Crowd sourcing
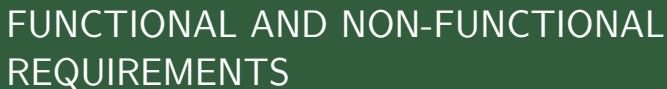
Figure 2: Class Diagram

Figure 3: Use Case Diagram

FUNCTIONAL AND NON-FUNCTIONAL REQUIREMENTS

Figure 4: Activity Diagram
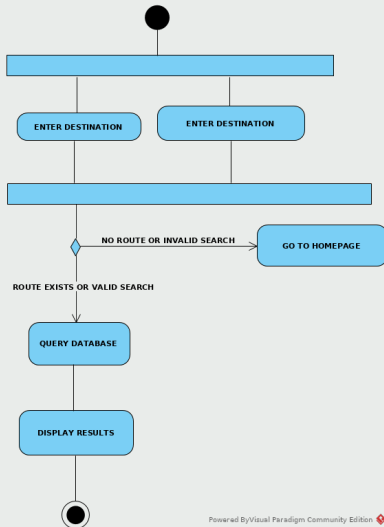
ENTER DESTINATION

ENTER DESTINATION

NO ROUTE OR INVALID SEARCH

GO TO HOMEPAGE

ROUTE EXISTS OR VALID SEARCH

QUERY DATABASE

DISPLAY RESULTS

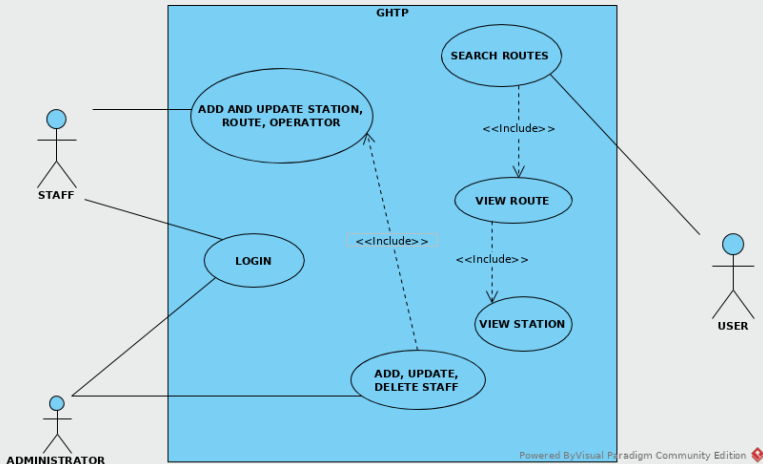Powered ByVisual Paradigm Community Edition

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The results and discussions:

$\star$ User gets routes based on destination and departure searched

$\star$ A user can access all available operators and view detailed information on each station

$\star$ User can compare fares visually

$\star$ A user is able to access station location in external platform

$\star$ Groups for managing staff privileges

$\star$ Detailed history of changes available in administration dashboard

GHTP

CONCLUSIONS AND RECOMMENDATIONS

It can be concluded that this system:

⋆ Will improve trip planning and easy access to information only available within terminals to traveler hence saving time

⋆ Should be adopted by Ghana Tourism Authority to help tourists find their way around Ghana transport network

I would recommend that:

⋆ Users should be able to book seats from the platform and also support voice input for the visually impaired

⋆ The system could get users current location and find nearest possible departure stations for their routes

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Abane, A. M. (2011), 'Travel behaviour in ghana: Empirical
observations from four metropolitan areas', *Journal of Transport
Geography* **19**(2), 313–322.

Aidoo, E. N., Agyemang, W., Monkah, J. E. and Afukaar, F. K.
(2013), 'Passenger's satisfaction with public bus transport services
in ghana:: A case study of kumasi–2013;accra route', **8**(2), 33–44.

Bonaventura, A. (2015), 'Assessment of customers' satisfaction from
large buses services in urban public transportation a case of
ubungo bus terminal'.

Fouracre, P., Kwakye, E., Okyere, J. and Silcock, D. (1994), 'Public
transport in ghanaian cities — a case of union power', *Transport
Reviews* **14**(1), 45–61.

Neumann, A., Röder, D. and Joubert, J. W. (2015), 'Toward a
simulation of minibuses in south africa', **8**(1), 137–154.

UNESCO (2010), 'Ghana and unesco annual magazine'.

THANK YOU