Project Proposal

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Project Title: A Distributed Long Distance Ridesharing system

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0.1 Declaration

This project is my original work and to the best of my knowledge, this work has not been submitted for any other award in any University.

Signature: .....

Date: .....

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P15/81741/2017

This project report has been submitted in partial fulfillment of the requirements of the BSc in Computer Science of the University of Nairobi with my approval as the University supervisor.

Signature: .....

Date: .....

PROF AGNES NDUKU WAUSI

0.2 Acknowledgement

I would like to thank my Supervisor Prof Agnes Nduku Wausi, for her support and guidance during the research and implementation of this project.

0.3 Abstract

This project aims to research and implement a long distance ridesharing system that connects drivers and passengers travelling to the same destination locations. Ridesharing is an interesting solution to some social problems like energy consumption, road congestion, providing quality travelling services and others. (Noland et al. 2006).

Ridesharing systems have been widely implemented and used in US and Europe since WW II. There are a lot of lessons that the Kenyan market can learn from them. There has been a lot of innovation caused by 'ride sharing', the like of Uber and lyft, which follow a relative different business model to ridesharing which is based on on helping drivers connect with passengers.

There is a gab for a social entrepreneurs to offer quality commuting services, using ridesharing. Some of the existing players in this sector have extended their services from short distance rides to long distance, due to the demand for such services.

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Chapter 1

Introduction

Ridesharing is also known as liftsharing or car sharing in the UK. This is different from the terms 'carsharing' in North America or 'car clubs' in the UK, which refer to short term auto use of a car from a fleet of cars, that are shared hourly by passengers, Shaheen et al. (2009).

Ridesharing is the sharing of a cars journey, so that one person drives, preventing the need for the other people to drive themselves to the location. The driver and the passenger are travelling towards the same direction or from the same starting point, Chan & Shaheen (2012). When payment is involved it is not for profitable reasons but to enable to cover the cost and services for the journey.

There has been a lot of interest in the ridesharing services in the recent years. This is because of the use of technology and easy access to internet services. Many people would prefer to travel on a private car than the public vehicles.

Ridesharing is seen as a solution to reducing congestion, offering quality services to people, and reducing energy consumption Noland et al. (2006). Governments have put in place policies to encourage ridesharing services.

1.1 Background

Ridesharing began in the US during the World War II,Ferguson (1997). The government encouraged carsharing to save rubber and fuel resources to be used in the war effort. Workers were incouraged to use the same car to and from work. During this time works in factories used notice boards to connect drivers and passengers.

After the war ridesharing services declined. The services later emerged during the 1970s due to the oil crisis. During this time corporates established internet notice boards and telephone-based computerized ridematching. They saw this as an opportunity to cut down fuel consumption.

In the recent years there has been an increased interest in ridesharing ser-

vices. These services are built on internet and GPS-smartphones. These services have transformed the industry. They have put innovation into the transit services.

It is estimated that in the next decade there will be a greater intergration of services, technology and policy support for ridesharing,Chan & Shaheen (2012). This is due to concerns for energy, congestion, climate change and dependency on oil.

1.2 Problem Statement

Going on a long distance journey is difficult in Kenya, if you do not own a car. The public means of transport are inconvenient and unreliable. During holidays, most people are stranded as the prices are hicked, the demand exceeds the supply. Apart from the Matatus most people prefer to hire cars. Hiring cars is expensive because they end up hiring the car for the days they will be away.

This is a big problem to the youths since most of them do not own cars and cannot afford to hire cars. The price of fuel has been increasing making transportation generally expensive for most people.

There is a need to connect people who are willing to share their cars with passengers during travelling. Currently private car drivers fear driving to the bus stations and pick passengers because they will spend a lot of time due to congestion at bus stations. In addition that only authorized vehicles are allowed to pick passengers at the bus stations.

Passengers have a need to access private cars that are travelling from and to their destination. They need this information earlier so that they can prepare and plan their journey well.

1.3 Objectives

Research Objectives

1. Review trends in ridesharing systems
2. Findout uses cases for ridesharing systems in Africa
3. Review on the adaptation of ridesharing systems in Africa

System Development Objectives

Develop a distributed system that will help solve this problem:-

1. Connect Drivers and Passengers using the system
2. Onboard a driver to offer services through the system
3. Drivers to post about their trips and accept passenger requests

4. Drivers to set their fare prices
5. Passengers to view available rides
6. Passengers to send requests for rides

1.4 Justification

Connecting drivers and passengers through a ridesharing system will help more people to travel from one city to another in Kenya. Passengers will travel with convenience hence traveling more frequently. This will help in the growth of the economy especially when they travel from cities to the rural areas.

1.4.1 Scope

Productt Scope

The required functions and features that must be completed for the project to be said to be complete.

1. Passenger to see available cars that are ready
2. Driver to accept passenger's request for ridesharing

Project Scope

Work that must be done in order to deliver the product according to product scope.

1. Set up the database
2. Set up deployment pipeline, for continuos development and deployment
3. Deploy the application in the cloud

1.5 Project Constraints

The proposed system will rely on cloud computing technologies to develop a fully distributed system.

Some of the cloud services are offered at a cost, but there are free vouchers that allow access to the services for the development and experimentation purpose.

Chapter 2

Literature Review

2.1 Related Work

In November 2020, SWVL launched a long distance ride sharing services by partnering with Matatu operators. The service was launched in 12 routes, connecting Naivasha, Nakuru, Molo, Eldoret, Narok, Bomet, Kericho, Kisii, Kisumu, Nyeri, Nanyuki and Machakos, (Wanjala 2020). Swvl was targeting to make the fare prices constant and have timely rides.

Although the service was launched during the nation locked down, Kenyans were eager to try the service. Especially those who have enjoyed their short distance ride sharing services. But in the long distance ride sharing business did not catch up. The Matatu operators would switch from the SWVL service when there was high demand. They needed the flexibility to decided and set the fare prices on their own.

From the experience of SWVL, we can lessons on how the market operates and what needs should be addressed. The Kenyan market is not ready for another 'uber' like product for long distance ride sharing, but it needs a ridesharing solution that equips both the driver and the passengers.

Chapter 3

System Analysis And Design

3.1 System Development and Methodology

The proposed system will be developed using the agile system development methodology.

1. Concept

   Select the project idea to work on. This project was selected by identifying a gap in the market.

2. Inception

   Set up the team that will develop the software. Provide the necessary tools and resources.

   Create Designs of the user interface and mockups and develop the project architecture.

3. Iteration

   Develop and deploy the minimum functionality as fast as possible. Then iterate the process.

4. Release

   Test the system and then release it.

5. Maintenance

6. Retirement

3.2 Schedule

3.2.1 Gantt Chart

	Task Name	Duration(Weeks)	Start	Finish
1	Project Proposal	2		12/11/2021
2	Requirements Gathering and Analysis	2	11/15/2021	11/26/2021
3	Architecture Design	2	11/29/2021	12/10/2021
4	UI Design	1	1/7/2022	1/11/2022
5	Prototype	3	1/14/2022	1/4/2022
6	Implement	5	2/7/2022	3/11/2022
7	Test	2	3/14/2022	3/25/2022
8	Deployment	3	3/28/2022	4/15/2022

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