A Project Report on

OPTIMIZING COURIER DELIVERY SYSTEM

Submitted in partial fulfilment of requirement

For the award of the degree

MASTER OF COMPUTER APPLICATIONS

Of

PES University

By

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2019

C E R T I F I C A T E

This is to certify that the project entitled **OPTIMIZING COURIER DELIVERY SYSTEM** is a bonafide work carried out by **VIJAYKUMAR R PAI PES1201702013, AYUSH PRATYAY PES1201702164, SUBHAM SINGH PES1201801830** submitted in partial fulfilment of the requirement of fourth semester course work of MCA during the academic session Jan-May 2019.

Project Guide

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Assistant Professor, Dept. of CA

Chairperson

Dr. Veena S

PES University

ACKNOWLEDGEMENT

We are pleased to acknowledge **Ms Deepthi S Narayan** for her invaluable guidance during the course of this project work.

We extend our sincere thanks to **Dr Veena S** H.O.D who continuously helped us throughout the project and without his guidance, this project would have been an uphill task.

We are also grateful to **Department of Computer Applications** for their invaluable help and support. We extend heartfelt gratitude to whoever has guided us through the difficulties of our project.

Every project requires some acknowledgment in the form of hard work, good ideas and people who have helped in every path of the project. It took 2 months to learn the concepts and develop the project. It is definitely worth remembering those precious moments when new ideas popped up in our minds and the people who have helped to proceed with our project.

We have worked hard to the best of our abilities and tried not to make any mistakes. If any are found, they are unintended.

Vijaykumar R Pai

Ayush Pratyay

Subham Singh

ABSTRACT

A Software as a service (SaaS) web application where in the system automates the delivery services that can make decisions as to which delivery point should be reached first for feasible ways by taking list of address from all the nearest delivery points.

CONTENTS

INTRODUCTION

OVERVIEW

This report discusses the result of the work done in development of "Optimizing Courier Delivery System" on JavaScript Platform. The project aims at the development of an application for solving the present difficulties faced by courier delivery agents by optimizing their courier delivery route according to the traffic conditions on the daily basis.

BACKGROUND AND MOTIVATION

Large courier companies use centralized computer systems to delegate delivery jobs to drivers.

If deliverymen carry multiple jobs concurrently these may lead to choose route, which may be sub optimal.

Therefore, with this system we tried to automate the courier delivery system, which can make decision that which delivery point it should reach first for feasible ways by taking list of address from all the nearest delivery points.

Therefore, with our application the system automates the delivery services that can make decisions as to which delivery point should be reached first for feasible ways by taking list of address from all the nearest delivery points.

OBJECTIVE

The final goal of the project is twofold.

1. Integration of google maps into the agent app, which helps the agent from the hassle of entering each and every location before delivering the courier quota for the day.

2. Automation of delivery services so that once the delivery agent enters the address of allotted packages, the system can make decisions as to which

package must be delivered first based on the nearest delivery points, traffic conditions and time taken.

METHODOLOGY

To implement the above goals, the following methodology needs to be followed:

1. Specifying the application and various components of the architecture.
2. Specifying the bindings between the various modules and JavaScript packages.
3. Specifying the server ports between the modules.
4. Analysis: Extracting the required data for analysis and then doing the analysis.

ANALYSIS

On the basis of analysis and literature survey regarding the present difficulties faced by the courier delivery executives, we decided to make this project as our mini project to help facilitate smooth delivery of the packages without any hassle for the delivery executives.

We made this possible by first integrating google maps into our application so that the delivery executive need not open the google map every now and then to check which route needs to be taken to reach sooner to the destination.

Secondly, once the delivery executive pin points all the locations of which he has to deliver the package for the day, our Google API automates the delivery services that can make decisions as to which delivery has to be made first by taking feasible route among all the available routes by taking list of address from all the nearest delivery points.

REQUIREMENT ANALYSIS:

SOFTWARE REQUIREMENTS:

Operating System: Windows 10 / Ubuntu

Front end: React.js v16.x, Bootstrap v4.2.1, HTML5 & CSS

Back end: Node.js v11.8.0

Database: MongoDB v4.0.1

HARDWARE REQUIREMENTS:

RAM: 8GB and above

Hard disk: 120GB and above

Processor: Intel i3 and above

FUNCTIONAL REQUIREMENTS:

1. Admin Login and Logout: This module enables the admin to have control over the packages to be delivered and active agents available to deliver the same.
2. Agent Login and Logout: This module enables the agent to know which packages are allotted to them for the day and where it has to be delivered.
3. Integrated Google Maps: Using Google Maps API, we have integrated the same in our application to help the agents deliver the package without any hassle.
4. Automate delivery routes: With this algorithm, we can automate the courier delivery that can make decisions as to which delivery point needs to be reached first by feasible ways from all the nearest delivery points.

NON-FUNCTIONAL REQUIREMENTS:

1. Platform independence: The web application should responsive on both the popular operating system Android and iOS.
2. Performance: The application should be able to run on all versions of OS after a limit and should consume less power. The web application should not crash at any condition.
3. Permissions and Authentication: The application should ask for user's permissions to access GPS. No one apart from authorized agent/admin should be able to log in.
4. Live updates: The agent will get live updates when connected to internet.

TOOLS AND TECHNOLOGIES:

APPLICATION DEVELOPMENT TECHNOLOGIES:

This application is built using MERN stack ie MongoDB, Express, React.js and Node.js.

MongoDB is an open-source database software which is NoSQL in architecture. It stores data as JSON document. It is fast, reliable and efficient.

Express is a web application framework for Node.js. It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js.

React.js is a JavaScript library for building user interfaces. Facebook and a community of individual developers and companies maintain it. React can be used as a base in the development of single-page or mobile applications.

INTEGRATION TOOLS:

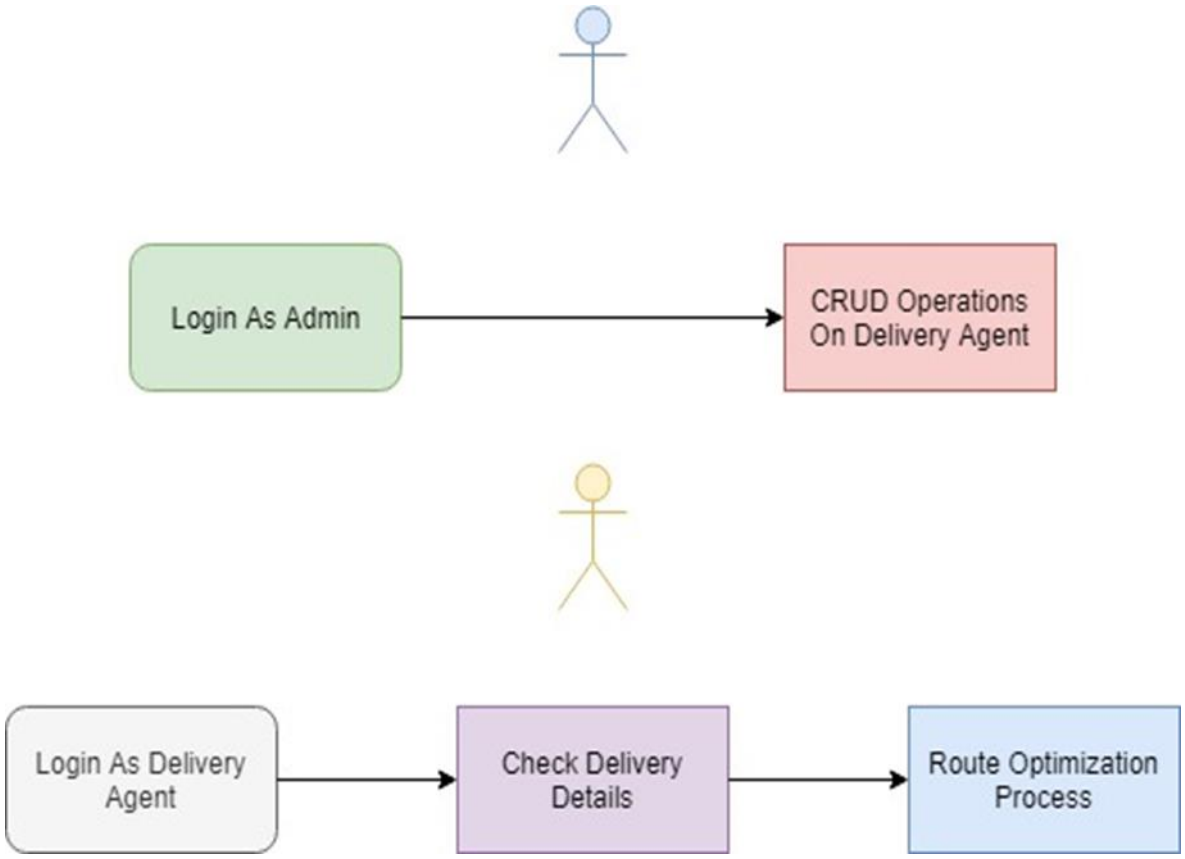
GIT AND GITHUB:

Git is a distributed version-control system for tracking changes in source code during software development. It is designed for coordinating work among programmers, but it can be used to track changes in any set of files. Its goals include speed, data integrity and support for distributed, non-linear workflows.

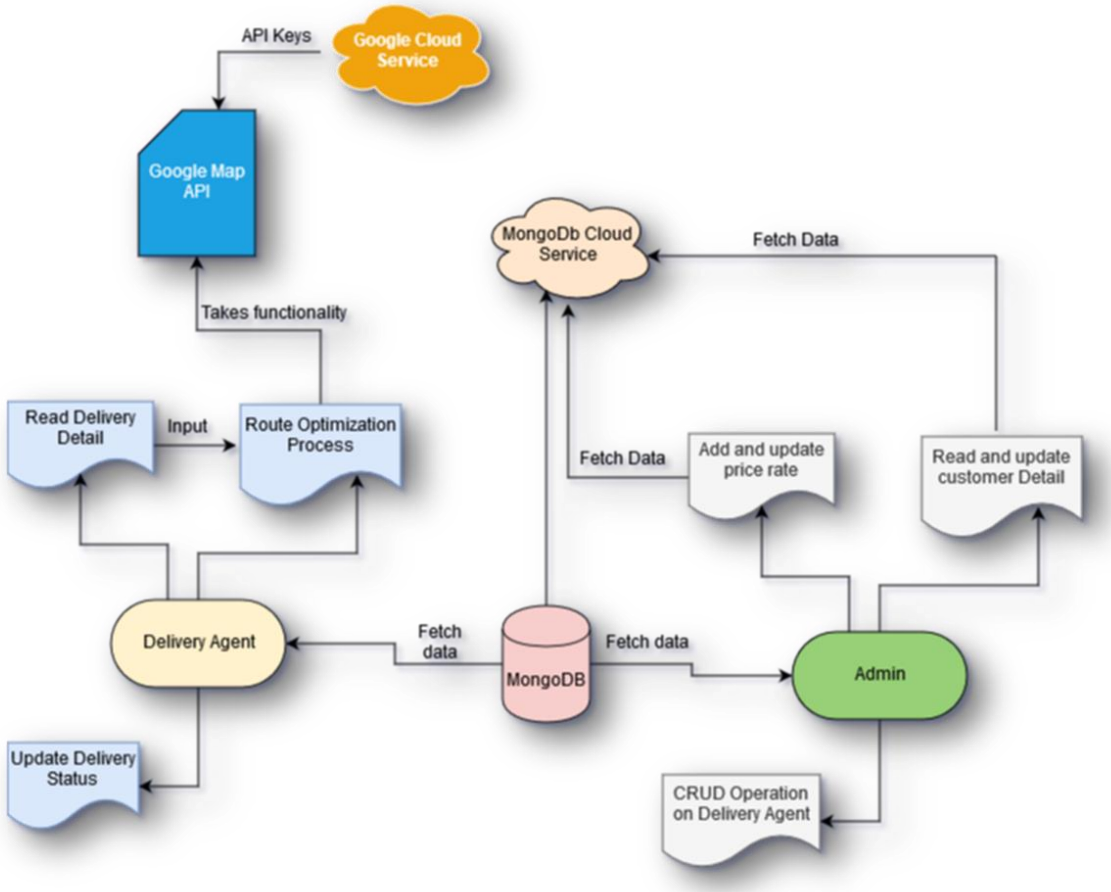
GitHub is a web based hoisting service for version control using Git. It is mostly used for computer code. It offers all of the distributed version control and source code management functionality of Git as adding its own features.

DESIGN

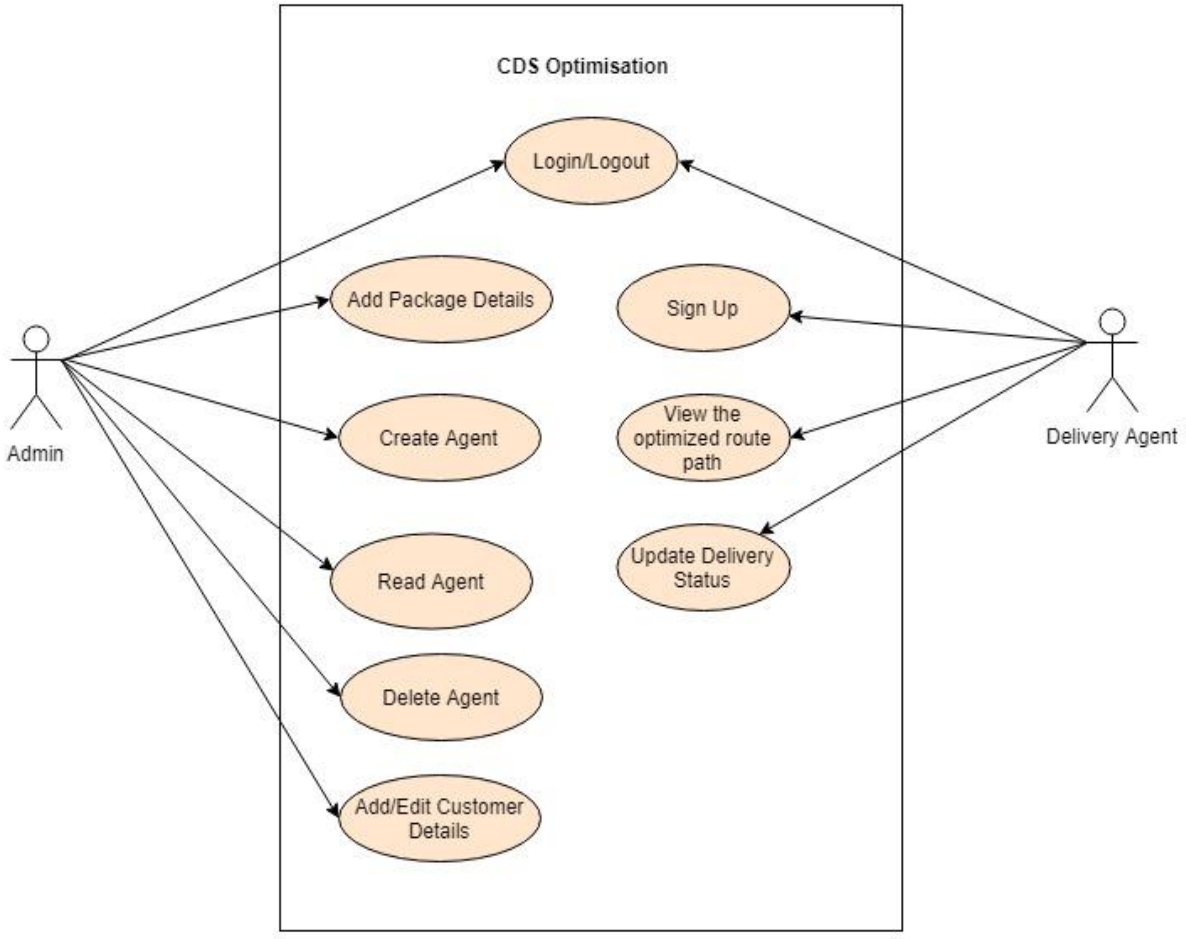
OVERVIEW OF THE SYSTEM



ARCHITECTURE OF THE SYSTEM



USE CASE DIAGRAM



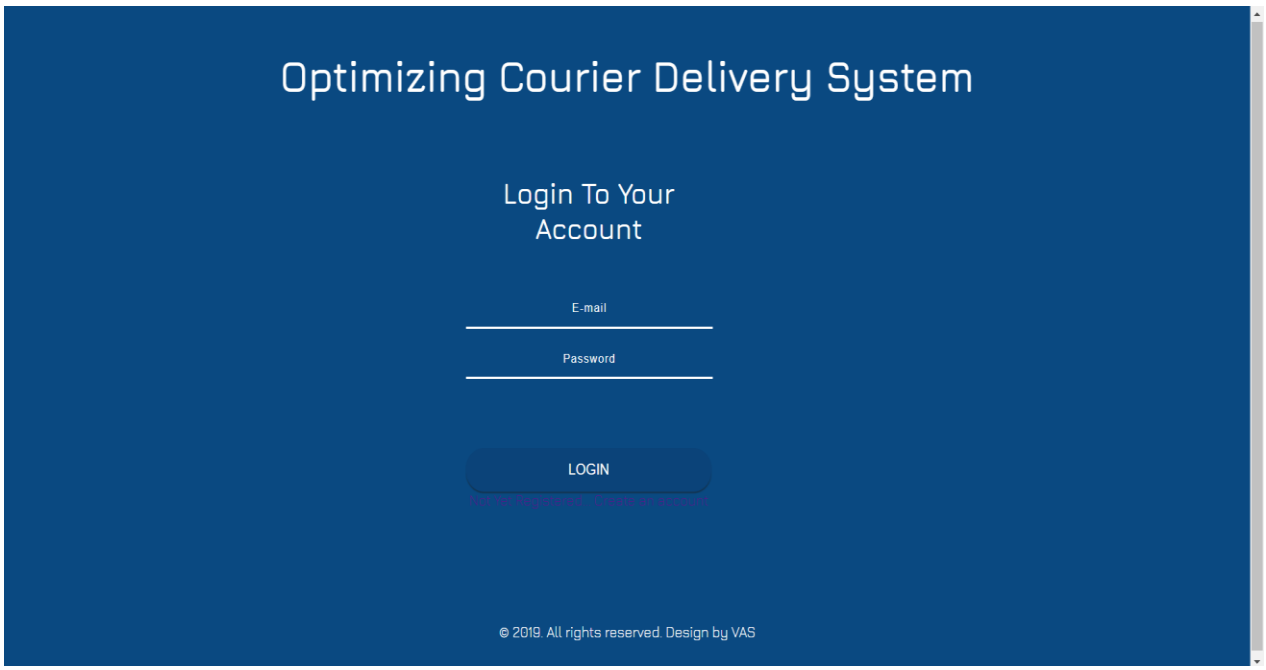
Our project consists of two folds:

1. Admin: Who has control over the application as to which all are the packages to be delivered to the destination and who all are the active agents and which packages are assigned to them for delivery.

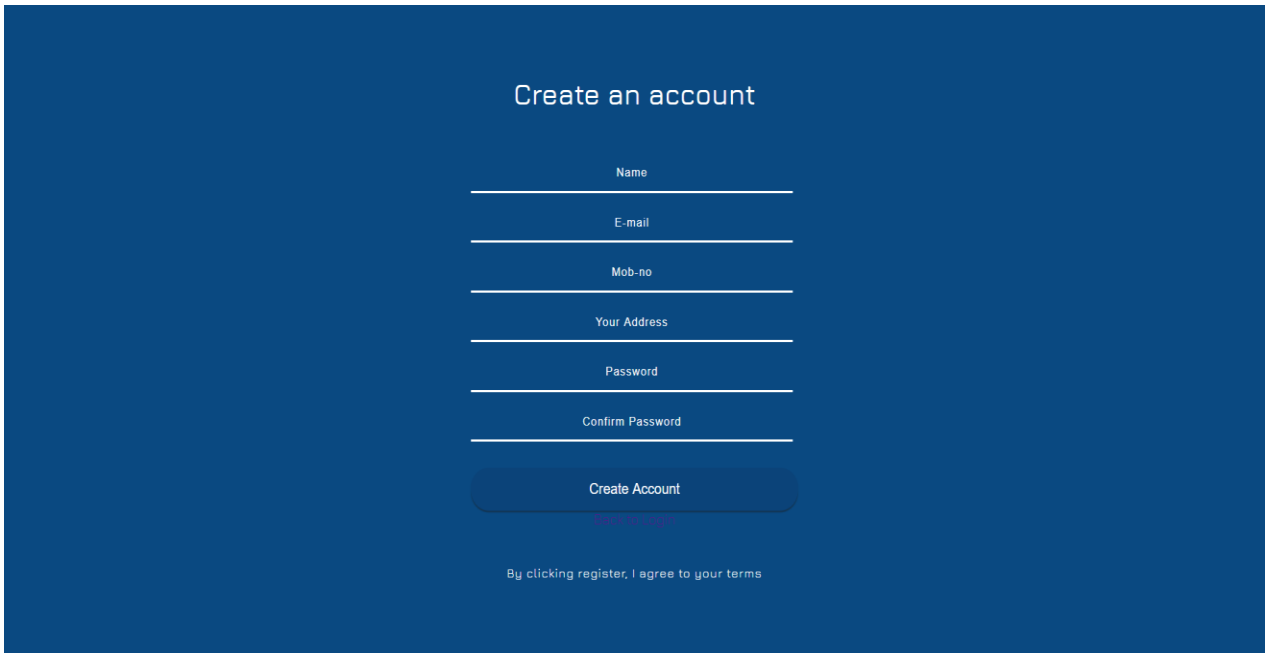
2. Agent: Who can see which courier has been allotted to him for the day. Once he starts the map, it automates as to which courier has to be delivered and which feasible route is to be taken based on the traffic conditions and time taken.

SCREEN SHOTS

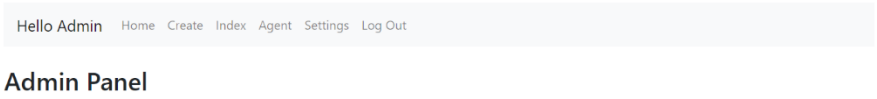
LOGIN SCREEN



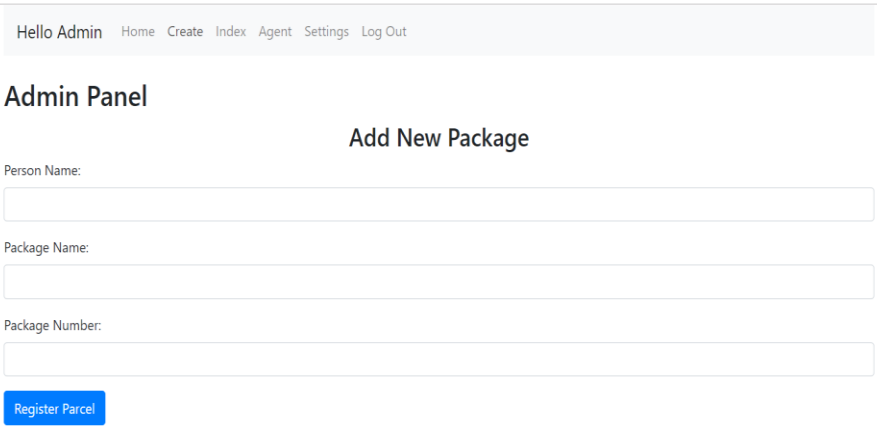
REGISTRATION FORM



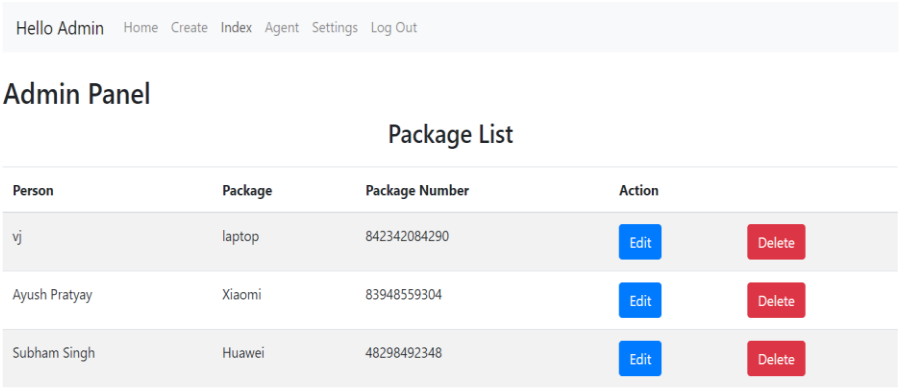
ADMIN HOMEPAGE



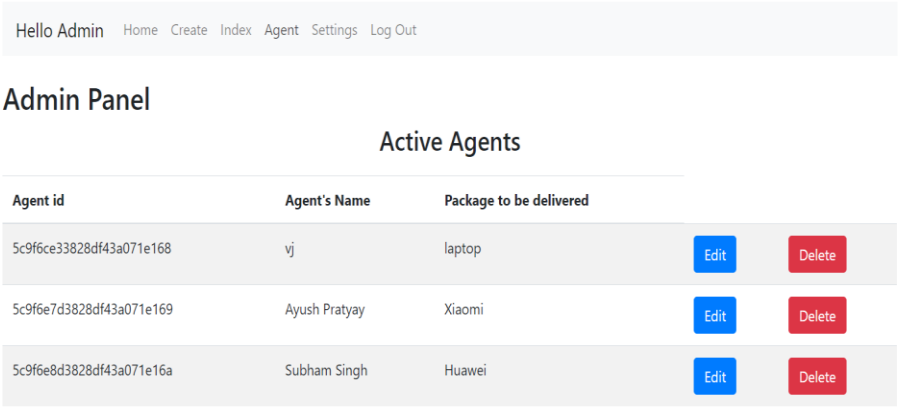
PACKAGE CREATION



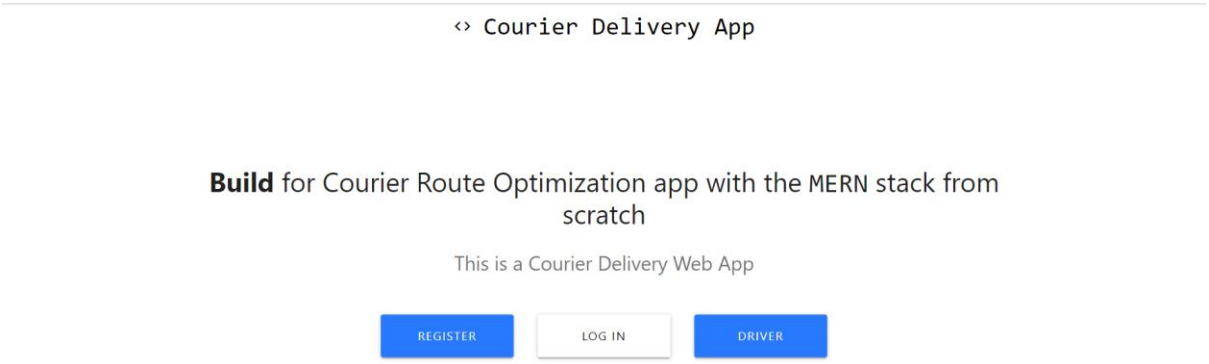
PACKAGE LIST



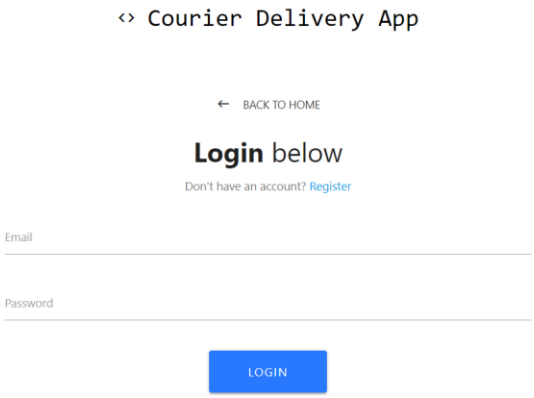
ACTIVE AGENTS LIST



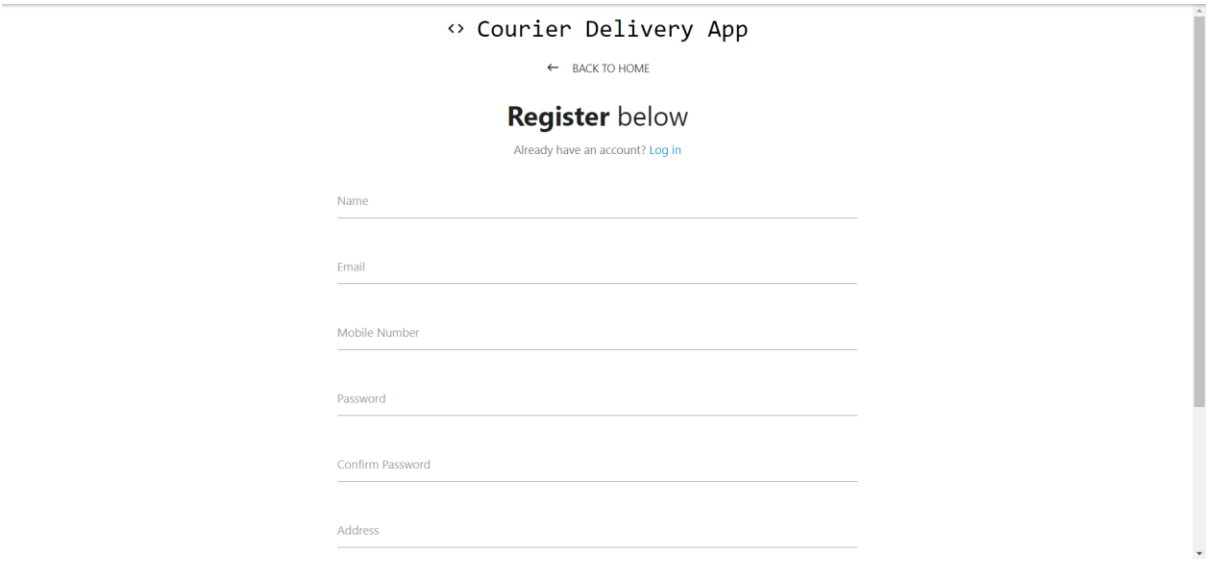
DRIVER MODULE



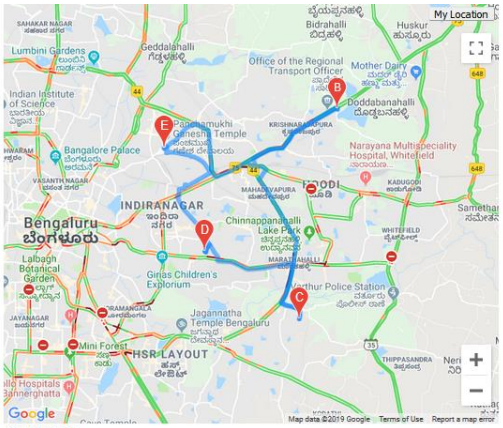
DRIVER LOGIN



REGISTRATION PAGE



MAP DEMO



Configuration

Travel Mode:	Car
Avoid Highways:	Disabled
Population Size:	50
Mutation Rate:	0.1
Crossover Rate:	0.5
Elitism:	Enabled
Max Generations:	50

Debug Info

Destinations Count:	4
Generations:	50
Best Time:	134.17 Mins

TESTING

Test Case ID	PES_001	**Test Case Description**	Test the Login Functionality in Admin Panel		
Created By	Vijaykumar R Pai	**Reviewed By**	Deepthi S Narayan	**Version**	1
QA Tester's Log					
Tester's Name	Vijaykumar R Pai	**Date Tested**	30-Mar-2019	**Test Case (Pass/Fail/Not Executed)**	Pass

S #	**Prerequisites:**		**S #**	**Test Data**
1	Access to Chrome Browser		1	E-mail = vijaykumarrpai@gmail.com
2			2	Password = 12345678
3			3	
4			4	

Test Scenario	Verify on entering valid email and password, the admin can login			
Step #	**Step Details**	**Expected Results**	**Actual Results**	**Pass / Fail / Not**
1	Navigate to localhost:3000	Admin login page should open	Admin login page is loaded	Pass
2	Enter E-mail & Password	Credentials can be entered	Credentials are entered	Pass
3	Click Login	Admin is logged in	Admin logged in successfully	Pass

Test Case ID	PES_002	**Test Case Description**	Test the Registration form Functionality in Admin Panel		
Created By	Vijaykumar R Pai	**Reviewed By**	Deepthi S Narayan	**Version**	1
QA Tester's Log					
Tester's Name	Vijaykumar R Pai	**Date Tested**	30-Mar-2019	**Test Case (Pass/Fail/Not Executed)**	Pass

S #	Prerequisites:		S #	Test Data
1	Access to Chrome Browser		1	Name = Vijaykumar R Pai
2			2	E-mail = vijaykumarrpai@gmail.com
3			3	Mob-no = 7582455420
4			4	Your Address = Blore
			5	Password = 12345678
			6	Confirm Password = 12345678

Test Scenario	Verify on entering name, email, mob-no, address, password and confirm password, the person can register as admin

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not
1	Navigate to localhost:3000	Admin login page should open and navigate to registration form	Admin page loaded and on click navigated to registration page	Pass
2	Enter name, email, mob-no, address, password and confirm password	Credentials can be entered	Credentials are entered	Pass
3	Click Create account	Admin account is created	Account created successfully	Pass

Test Case ID	PES_003	**Test Case Description**	Test adding new package Functionality in Admin Panel		
Created By	Vijaykumar R Pai	**Reviewed By**	Deepthi S Narayan	**Version**	1
QA Tester's Log					
Tester's Name	Vijaykumar R Pai	**Date Tested**	30-Mar-2019	**Test Case (Pass/Fail/Not Executed)**	Pass

S #	**Prerequisites:**		**S #**	**Test Data**
1	Access to Chrome Browser		1	Person name = vj
2			2	Package name = Laptop
3			3	Package number = 5845098591
Test Scenario	Verify on entering name, email, mob-no, address, password and confirm password, the person can register as admin			

Step #	**Step Details**	**Expected Results**	**Actual Results**	**Pass / Fail / Not**
1	Navigate to localhost:3000	Admin login page should open	Admin login page loaded	Pass
2	Enter E-mail & Password	Credentials can be entered	Credentials are entered	Pass
3	Click Login	Admin is logged in	Admin logged in successfully	Pass
4	Navigate to create section	Page is loaded	Toggled to create section	Pass
5	Enter person name, package name and package number	Data is entered	Required fields are entered	Pass
6	Click Register Parcel	Data is stored in DB	Data stored successfully into DB	Pass

Test Case ID	PES_004	**Test Case Description**	Test adding Package list Functionality in Admin Panel		
Created By	Vijaykumar R Pai	**Reviewed By**	Deepthi S Narayan	**Version**	1
QA Tester's Log					
Tester's Name	Vijaykumar R Pai	**Date Tested**	30-Mar-2019	**Test Case (Pass/Fail/Not Executed)**	Pass

S #	**Prerequisites:**		**S #**	**Test Data**
1	Access to Chrome Browser		1	Person name = vj
2			2	Package name = Laptop
3			3	Package number = 5845098591
Test Scenario	Verify on clicking the delete button in package list, the respective package is deleted.			

Step #	**Step Details**	**Expected Results**	**Actual Results**	**Pass / Fail / Not**
1	Navigate to localhost:3000	Admin login page should open	Admin login page loaded	Pass
2	Enter E-mail & Password	Credentials can be entered	Credentials are entered	Pass
3	Click Login	Admin is logged in	Admin logged in successfully	Pass
4	Navigate to index section	Page is loaded	Page loaded successfully	Pass
5	Click delete to remove a particular package	Package is deleted	Package deleted successfully	Pass

Test Case ID	PES_005	**Test Case Description**	Test Agent list Functionality in Admin Panel		
Created By	Vijaykumar R Pai	**Reviewed By**	Deepthi S Narayan	**Version**	1
QA Tester's Log					
Tester's Name	Vijaykumar R Pai	**Date Tested**	30-Mar-2019	**Test Case (Pass/Fail/Not Executed)**	Pass

S #	**Prerequisites:**		**S #**	**Test Data**
1	Access to Chrome Browser		1	Person name = vj
2			2	Package name = Laptop
3			3	Package number = 5845098591
Test Scenario	Verify on clicking the delete button in package list, the respective package is deleted.			

Step #	**Step Details**	**Expected Results**	**Actual Results**	**Pass / Fail / Not**
1	Navigate to localhost:3000	Admin login page should open	Admin login page loaded	Pass
2	Enter E-mail & Password	Credentials can be entered	Credentials are entered	Pass
3	Click Login	Admin is logged in	Admin logged in successfully	Pass
4	Navigate to agent section	Page is loaded	Page loaded successfully	Pass
5	Click delete to remove a particular agent	Agent is deleted	Agent deleted from DB successfully	Pass

Test Case ID	PES_006	**Test Case Description**	Test the Login Functionality in Agent Panel		
Created By	Ayush Pratyay	**Reviewed By**	Deepthi S Narayan	**Version**	2.1
QA Tester's Log					
Tester's Name	Ayush Pratyay	**Date Tested**	31-03-2019	**Test Case (Pass/Fail/Not Executed)**	Pass

S #	**Prerequisites:**	**S #**	**Test Data**
1	Access to Chrome Browser	1	E-mail id = Ayush@gmail.com
2		2	Pass = arpit1
3		3	
4		4	

Test Scenario	Verify on entering valid user id and password, the Agent can login

Step #	**Step Details**	**Expected Results**	**Actual Results**	**Pass / Fail / Not executed /**
1	Navigate to http://localhost:3000/	Agent login page should open	Agent login page loaded	Pass
2	Enter E-mail id & Password	Credentials can be entered	Credentials are entered	Pass
3	Click Login	Agent is logged in	Agent logged in successfully	Pass

Test Case ID	PES_007	**Test Case Description**	Test the Registration Functionality in Agent Panel		
Created By	Ayush Pratyay	**Reviewed By**	Deepthi S Narayan	**Version**	2.1
QA Tester's Log					
Tester's Name	Ayush Pratyay	**Date Tested**	31-03-2019	**Test Case (Pass/Fail/Not Executed)**	Pass

S #	**Prerequisites:**	**S #**	**Test Data**
1	Access to Chrome Browser	1	Name = Ayush
2		2	Email Id = Ayush@gmail.com
3		3	Mob-no = 9876543210
4		4	Address = Banshankari
5		5	Password = arpit1
6		6	Conf password = arpit1

Test Scenario	Verify on entering name, email, mob-no, address, password and confirm password, the person can register as agent

Step #	**Step Details**	**Expected Results**	**Actual Results**	**Pass / Fail / Not executed /**
1	Navigate to http://localhost:3000/	Agent registration page should open and navigate	Agent login page loaded	Pass
2	Enter name, email, mob-no, address, password and confirm password	Credentials can be entered	Credentials are entered	Pass
3	Click Register	Agent account is created	Agent account created successfully	Pass

Test Case ID	PES_008	Test Case Description	Test the Login Functionality in Driver module		
Created By	Ayush Pratyay	Reviewed By	Deepthi S Narayan	Version	2.1
QA Tester's Log					
Tester's Name	Ayush Pratyay	Date Tested	31-03-2019	Test Case (Pass/Fail/Not Executed)	Pass

S #	Prerequisites:	S #	Test Data
1	Access to Chrome Browser	1	E-mail id = Ayush@gmail.com
2		2	Pass = arpit1
3		3	
4		4	

Test Scenario	Verify on entering valid userid and password, the Driver can login

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed /
1	Navigate to http://localhost:3000/	Driver login page should open	Driver login page loaded	Pass
2	Enter E-mail id & Password	Credentials can be entered	Credentials are entered	Pass
3	Click Login	Driver is logged in	Driver logged in successfully	Pass

CONCLUSION

The objective of the project was to solve the difficulties faced by the courier delivery agents as to which courier has to be delivered first, which has been solved with our application as it shows feasible route once the delivery agent enters the location of the package to be delivered based on traffic conditions and time taken. Since our application is built with React JS, it is lightweight, responsive, loads faster once it will be deployed. Hence, the objective has been fulfilled and application shows optimized route for delivery of the courier.

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