Development of Intelligent Pick and Drop Service Manager for Small Cities

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ABSTRACT

The main target for this application is to propose a software which is able to facilitate the people of a small city for any kind of pick and drop services that are required in the locality. It is a very general observation that in the localities where taxi services are not available people finds it very difficult to send one parcel from one point to another. Just to remove the problems the article proposes a mechanism in which there will be a web-based application that can be helpful enough for serving this purpose. However, it is not at all very simple to manage than conduct all kind of services and research for this observation. This system is in its initial stages and trying to find out a more robust solution, the best way it can in the first release of the product. The services that are available to the user for a small city, will be taken care by the local vendors who do the pic and drop of various things from one point to another. These agents are available all over the city and they work for less amount of money, thereby saving a lot of people for which everyone can accept the services very easy.

Keywords: Artificial intelligence; Pick and drop; Intelligent application; Development; Software engineering; UML; DBMS; System; Analysis.

1. Introduction

Whenever someone tries to send a parcel to a distant location in the country, it becomes problematic to collect the parcel since the door-to-door delivery services are unavailable. It is clear from the existing scenario that no such service exists easily [1]. The delivery of a packet or a career from any place or city in Saudi Arabia is done with the help of well-known service providers in the market. However, service providers are not eligible to deliver service packets to the destination in small cities like Shaqra. In return, they call the destination person to go and visit them to collect the service from their offices in the towns nearby.

Thus, it becomes a big problem for the customer who intends to receive a parcel from a particular location in Saudi Arabian countries or abroad. It is also becoming a huge problem. Whenever there is an oversized parcel to be delivered from one place to another point in the city or a product from the city [2], the available services are from vendors who are not available in the city and for a small delivery, they charge too much amount of money from the customers [3]. Thus, sending parcels from one point to another in the local city or from the outside skirts of the town becomes problematic. A solution needs to be devised and designed for this problem, and little knowledge and understanding says that problem-solving is required for the people of the cities living in a place distant from the metropolitan city areas [4]. Various observations lead to the fact that the charges enforced on the customers are too much from the higher and organized units, which take a lot of time for the pickups, and the deliveries are sometimes scheduled for long days or weeks. Thus, there is a vital requirement for this kind of system, which will be able to solve the problem stated in this section. The application that is supposed to be created contains the client/server architecture for a web-based application architecture system [5]. Website nowadays has a comparative and collaborative mobile application along with it. Thus, the second release of this application will be relative to our mobile application, which will share the centralized database with the website. In the first release of this

application, the user shall be able to find out from the web service which possible and available places to send this courier for a pick and drop service [6]. This problem can be solved with a system capable enough to make an actual business model. This business model will comprise two critical factors. Firstly, there is a partnership with the agents that will be providing the services, and second, there is the collaboration of these services with the management of the system [7]. A collective partnership of the ratio of 70% - 30% can be managed under the provision of the system.

2. Objectives of the Study

This system's main target is finding the best possible pick-and-drop service in a small city. All the agents listed inside the system will be accessible to the users, and they can ask for the drop and pic of a particular courier parcel. The location that the customer will give shall be the point of contact for the agent to visit and hold the parcel from there. The system will be able to generate bills depending on the cost of pick and drop based on KM., and the agent will apply the charges to this problem. However, there can be various charges in various agents can provide a variety of charges, but the system is capable enough and strong enough to give the best possible charge without having, loss of money from the customer [8].

The system can be a prepaid system in which all the facts and the prices are defined before the model selection. All the customers will be in a state to find out in advance how much money will be charged by the agents for pick and drop from one point to another of the courier packets depending on the number of weights of kilograms that are asked to be sent [9]. The greater the value of the kilograms that are asked to be sent by the customer from the representative agent, the better the prices of the pic and drop service.

Finally, the project scope can be summarized to a significantly higher-level in which the guidance from the system can be given to the person, which will be of various importance for this particular person to avoid any kind of irrelevant payments from different big companies and organizations that can arise in the future [10]: (i) To provide the pic and drop services of various articles from one point to another, (ii) To manage a network of agents who will efficiently deliver courier packets from one point to another within a common city, ensuring timely and secure delivery, (iii) To manage all the people and services required to provide pic-and-drop services from one point to another in a small city, (iv) To design a prototype that can be adopted by various small cities, creating a local network for pick and drop services in the immediate vicinity, thereby enhancing local connectivity and convenience, (v) To handle all the requests, generate the bill for the people who used the services, and provide the necessary amount to the agents, (vi) Finally, we ensure that the goods are delivered from the correct position and to the correct location as desired by the customer, and (vii) A business model for both the agents and the system designers and developers.

The study aims to develop a web-based artificial intelligence application which has the power to facilitating people to apply for any pick-and-drop services for particular groups in a small city and achieve its goals as follows: (i) user can apply for services, (ii) agents can view the requests, (iii) agents can approve the requests, (iv) user can pay the amount, (v) agents can receive the amount, (vi) invoice and Bill management for the user, (vii) scheduling of agents for delivering parcels, and (viii) service generation and handling.

The study aims to develop an application for managing a system which can define the level of services for pick and drop that are available inside the Saudi Arabian kingdom's small cities [11]. This system decides the category level of the agent, and depending on the level of the Cadre, the user can apply to them [12]. This system can be handy for various users and agents. The following can be considered as the outcomes of this study: (i) Any registered user will be having the application accessed easily, (ii) A registered user can make use of the website also to order for the request of specialist agent, (iii) Grading of the agents will be done based on the people review and evaluations, (iv) Finally, this user can find out the most suitable agent for his requirement, (v) The web-based system will be sufficient in order to provide the suitable requirement of the user and propose a particular agent which can be helpful enough to find out the solution of his pick and drop, and (vi) Great business model sources of funding.

3. Software Engineering of System

Any system must be modelled correctly and accurately before the development stage begins [13]. This article contains the basic UML modelling of the complete system needed to solve the problem of intelligent pick-and-drop services in a small town or city to develop the system.
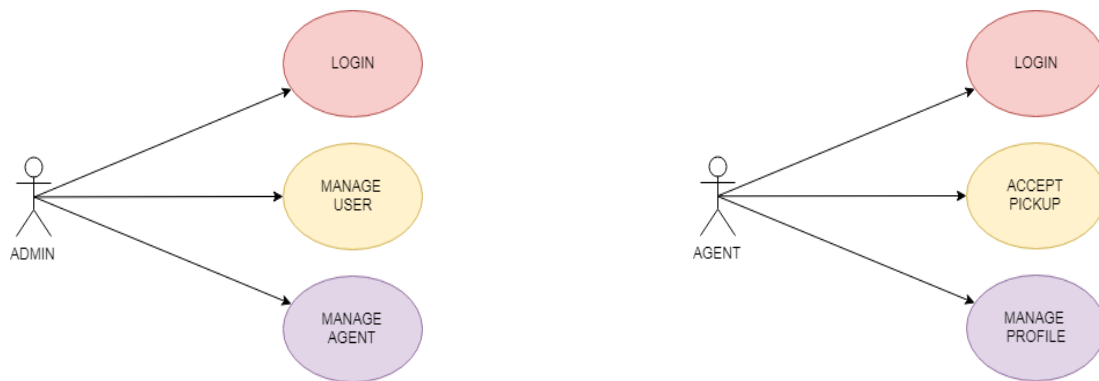
Use Case Diagram for i-PickUp:

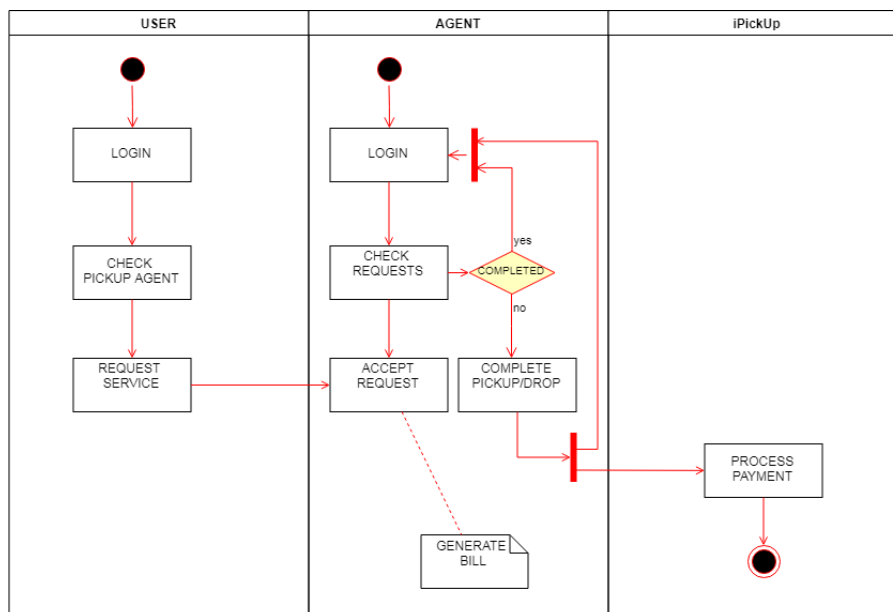**Figure 1.** Use Case Analysis of the admin and agent for the i-PickUp

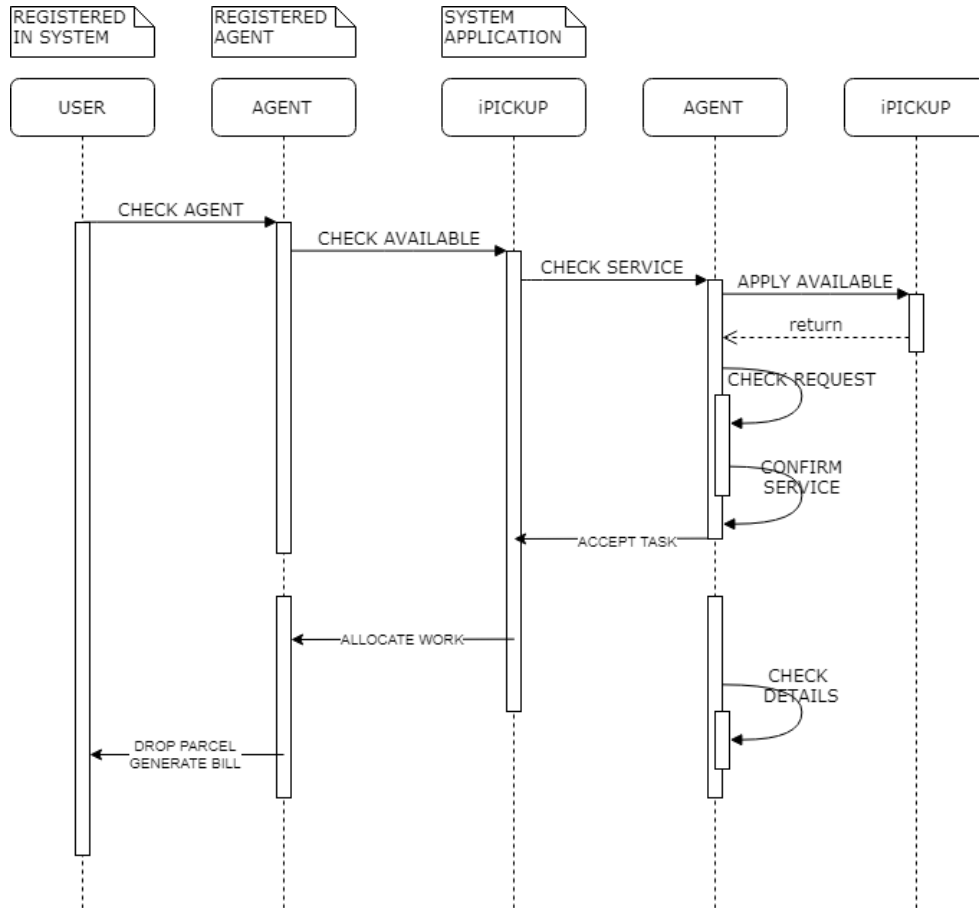
Figure 2. Activity Diagram of the i-PickUp System

Figure 3. Sequence Diagram of i-PickUp System
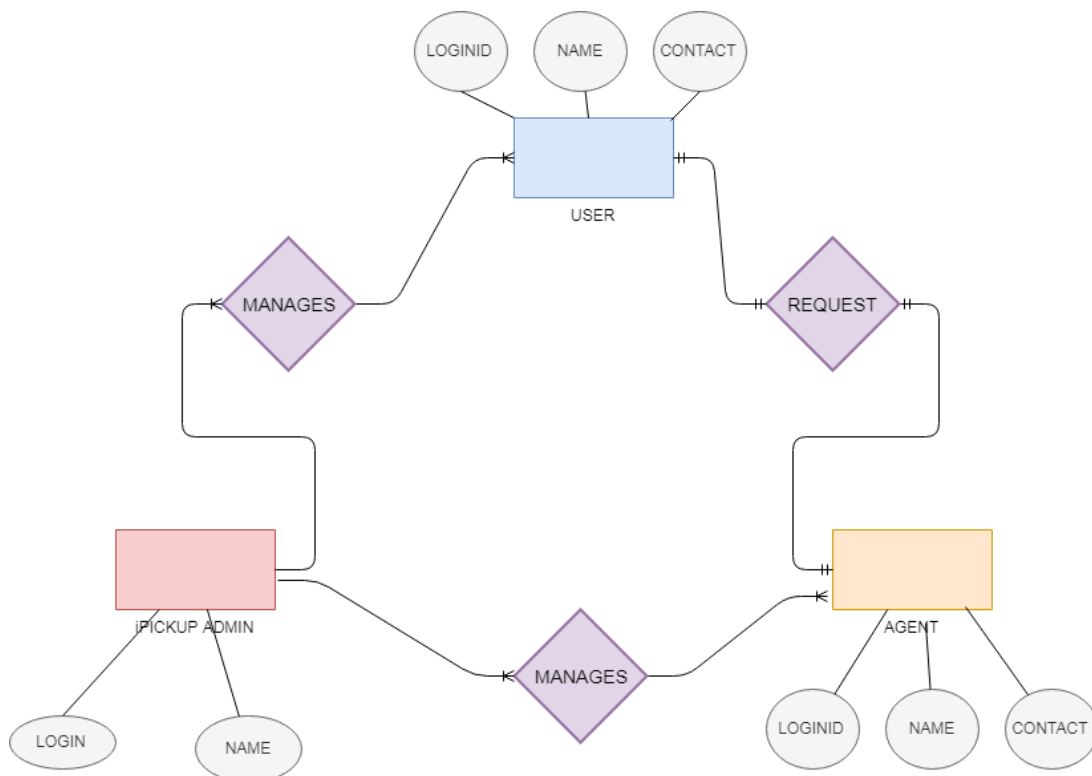
4. Database Analysis of the System

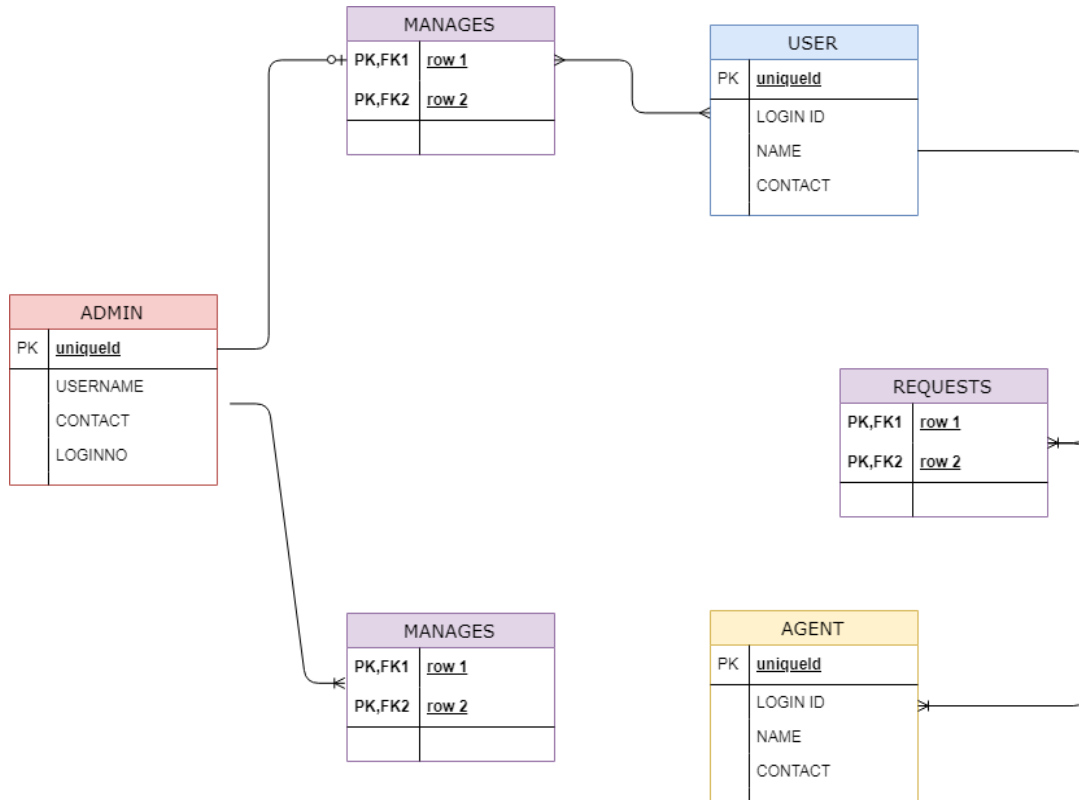**Figure 4.** ER Diagram of the i-PickUp System

Figure 5. Database Schema Diagram

5. Deployment of the System

To work well, a computer/server that has the following requirements is needed for the system to be developed and deployed:

• I7 Intel Core Machine
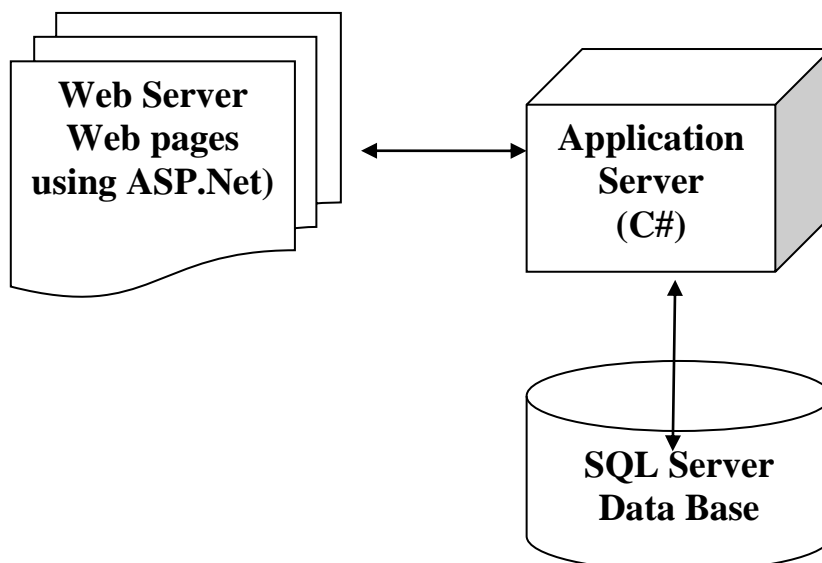
• 500 GB of SSD Storage

• 32GB of RAM

Figure 6. Architecture of Application Deployment

Table 1. Software that have been used when implementing this system

Software Name		Description
1	Windows 11	Operating System
2	Word 2019	Project Documentation
3	Draw.io	UML Modelling of the project
4	Photoshop	Develop icons for project
5	Visual Studio Code	Code Implementation
6	Flutter	Mobile app designing
7	FTP Server	For file upload
8	Acrobat Reader	Read the related reports and documents
9	MySQL	DBMS System
10	IIS Web server	Hosting the test project in test environment

6. Conclusion

A feasibility study aims to discover whether the project can be done successfully and provide possible negative and positive outcomes before investing too much time to implement it to persuade results. To save the cost of delivery services in small towns and cities is a huge question. All the people working for this noble cause shall deliver the contents from one point to another for less money than expected by the customer. The implementation logic is also going to be very simple but effective. The application that is concerned for this task shall be of great importance. Thus, implementing this project can result in various positive changes and improvements in society. Also, it can be depicted from the project's idea and concept that it will resolve multiple problems that can arise with pick-up and drop services soon. The availability of the best specialist for a problem, and at a particular time without having any problem with the transport facilities or services, makes the project a success story.

7. Future Suggestions

The system represents a robust mechanism for the analysis of the information and providing a means for pick and drop service in small towns. Soon, the system is expected to be extended for more bigger cities. The integration of Generative AI is expected to be a part of the upcoming system design. There is a scope for developing a website along with a mobile application for tracking of such a system. This is also a zone that might be expanded soon. Finally, the integration of vocal commands and interactive voice response for the booking of pick and drop is also one of the major enhancements that can be done to make the system better in the near future.

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Competing Interests Statement

The authors declare no competing financial, professional, or personal interests.

Consent for publication

The authors declare that they consented to the publication of this study.

Authors' contributions

All the authors took part in literature review, analysis and manuscript writing equally.

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