Living Smart: AI-Based Urban Assistance Systems for Sustainable Wellbeing in Small Cities

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ABSTRACT

It is commonly observed that when traveling to an unfamiliar city, it can often be challenging to find help when needed. Whether it's locating markets, food outlets, pharmacies, hospitals, workshops, or other essential services, travelers require a reliable guide that is easily accessible. While applications like digital maps are helpful to some extent, they often fail to provide timely, location-specific information. Moreover, these tools are typically not directly connected to service providers, making it difficult to identify and contact the right person or place for assistance. As a result, finding accurate and immediate information in a particular location becomes a cumbersome task. To address this issue, there is a clear need for a solution that connects users directly with available services in real time. The system we propose is designed to support access to a wide range of necessary services that visitors frequently require when exploring a new city. This platform aims to make the process of finding and utilizing such services seamless, efficient, and user-friendly.

Keywords: Artificial Intelligence; Machine Learning; Algorithms; Design; Development; Unified Modelling Language; Software Engineering; Digitization; Platforms; Transformation; Software.

1. Introduction

The current systems designed to assist people in unfamiliar cities are often inadequately equipped to provide the level of support needed. While commonly used applications like digital maps can display marked locations and basic details, they fall short in delivering real-time, practical information. For example, users often struggle to determine whether a specific shop or service center is currently open or operational. The inclusion of real-time availability status for service providers and businesses within the system would significantly enhance its usefulness. To reach a particular place, this user must struggle a lot to find out the location of a particular service center.

1.1. Problem Description

In today's urban environments, the existing systems that provide support and assistance to people in unfamiliar cities are often disorganized and lack efficiency. Although cities may have numerous individuals offering various services—ranging from basic needs like food and transportation to more specialized help such as medical aid or mechanical repairs—the availability and real-time status of these service providers are typically unknown [1]. The current infrastructure does not effectively inform users whether someone is available to assist at a given time or location, making it difficult to connect those in need with those ready to help.

Moreover, a recurring issue is that people who are technically online or nearby might not appear as available on existing platforms, or worse, may be visible but unresponsive. This gap leads to uncertainty and inefficiency in accessing timely assistance. Even well-meaning volunteers or service groups offering support for a noble cause often struggle to identify where exactly their help is needed. This disconnection between the service provider and the seeker creates unnecessary delays and frustration. There is also the challenge of trust—travelers or new city

dwellers may find it hard to distinguish genuine, honest service providers from unreliable ones, further complicating the situation.

In many cases, a person in need of urgent support is forced to navigate multiple platforms or call various contacts just to locate an open store, a working hospital, or a functional service center nearby [2]. This not only consumes valuable time but also adds stress during already challenging situations. Clearly, there is a pressing need for a more intelligent, unified system that bridges the gap between service providers and those seeking assistance.

Such a system should be capable of identifying available helpers or businesses based on their real-time status and geographic proximity. It must allow users to search for services by category and instantly view available options within their vicinity. In addition, the system should provide a mechanism to assess the credibility and nature of help that each provider can offer, ensuring that users receive appropriate and trustworthy support.

The goal of the proposed study is to develop an efficient digital solution that empowers users—especially those who are new to a city—to find reliable help at the click of a button. Whether it's finding a nearby pharmacy, mechanic, food outlet, or even a volunteer for immediate assistance, the system should make this process seamless and transparent. Importantly, this platform must function effectively even for individuals who are not familiar with the local environment, culture, or language. By integrating live data and user-friendly features, the study aims to make cities more accessible, supportive, and safer for everyone [3, 4]. In summary, this initiative seeks to build a smarter, service-oriented ecosystem where help is not just available but also easily discoverable and dependable—no matter where you are in the city.

1.2. Research Expected Outcomes

Taking into consideration all the points discussed in Section 1.2, the technical requirements and expected outcomes of the proposed system were thoroughly examined and defined for the study. The primary stakeholders involved include the user, the service providers, and the system itself, which will function as a bridge to effectively connect users with the appropriate services based on their needs and location [5]. To establish a strong relationship between these three components, an in-depth study was conducted, leading to the identification of several key objectives necessary to address the existing challenges. These objectives include:

1) Identifying the most suitable services available to a user at a specific location within the city.

2) Continuously tracking all available services near the user's current location, enabling real-time assistance.

3) Monitoring the availability of users or service providers who are active during a particular time slot and can offer immediate support.

4) Designing a robust system capable of locating and categorizing services based on type and relevance, as per the user's request.

5) Generating a comprehensive list of services accessible in a given area for any requesting user.

6) Collecting and displaying detailed information about service centers and providers in smaller cities such as Shaqra.

7) Identifying helpful individuals who are willing and ready to assist others whenever needed.

8) Tracing service requests made by users and ensuring that the requested assistance is delivered efficiently and accurately.

1.3. Proposed Solution

The objective of this study is to develop an application that assists users who are entering a city for the first time and require access to various essential services. These services will be offered by individuals who have already registered within the system and are actively available to help. The system will ensure that users can easily locate and connect with service providers through a user-friendly interface. The services offered by registered users will be efficiently accessible, supported by a robust framework that connects those in need with those helping [6]. The design of the system will incorporate several core functionalities and goals:

1) Registered users will have seamless access to the application.

2) In addition to the mobile application, users will also be able to utilize a website to request services.

3) Users can log into the system to access and request specific services.

4) A catalog of available services will be provided, allowing users to browse offerings near their current location.

5) Users may apply for one or more services based on availability and need.

6) Service providers who are currently online and available to assist will be visible in the system and can respond to requests.

7) Providers who offer services at specific times will be accessible when searched for during those periods.

8) The system will indicate the availability of online services clearly for user convenience.

9) Ultimately, the requested services will be delivered according to the user's demand and specific requirements.

1.4. Study Objectives

Presently, the existing infrastructure of support systems in cities lacks this dynamic capability, limiting their effectiveness in truly helping visitors navigate and access essential services efficiently:

1) A system that identifies only the locations.

2) The system provides the necessary information, but not on a general basis, but as an overall system.

3) User can only identify the locations but he's not able to contact the people who are available at a particular time.

4) Normally very little information is available on the system.

5) It becomes difficult to identify which place to go at a particular point at which players do not want to go.

2. Literature Review

When exploring the range of existing solutions available across Saudi Arabia, one can find thousands of websites and web-based map applications aimed at assisting people in navigating cities and locating services [7]. However,

in reviewing several of the most widely used systems, it becomes clear that while these platforms provide some level of support, they fall short in terms of offering real-time, user-specific assistance [8]. This comparison has proven valuable in identifying the limitations of current solutions and in justifying the need for a new, more effective system—one that addresses existing gaps and provides greater utility for users in all situations [9].

The system we aim to develop is designed to overcome the limitations of conventional platforms. Most common digital maps offer static information such as the location of landmarks or businesses but lack real-time updates and personalized support [10]. They do not actively assist users in emergency situations or when immediate service is required. For instance, if someone experiences a car breakdown in an unfamiliar city, traditional maps may show garages but won't indicate which ones are currently open or operational. In such scenarios, users are often forced to rely on luck or ask nearby strangers—an approach that is both inefficient and unreliable, especially in deserted areas or during odd hours.

This highlights the urgent need for a smarter, real-time assistance system—one that not only displays nearby services but also provides live availability, service status, and user feedback. Our proposed solution is intended to simplify the user experience by enabling quick and accurate access to help when and where it's needed most. By integrating location-based services with real-time data and community-driven support, this system has the potential to significantly improve daily life for travelers, residents, and anyone unfamiliar with their surroundings [11, 12]. It is therefore, a timely and essential innovation aimed at making urban navigation safer, easier, and more reliable.

2.1. Related Works

Considering the various challenges and limitations observed in existing service systems, we have critically evaluated two prominent platforms currently in use to assist individuals who are new to a particular location or city [13]. While these systems have been widely adopted and are generally perceived as helpful by casual users, a deeper analysis reveals several shortcomings that are not immediately apparent to the public [14]. Most users, due to limited technical knowledge, tend to overlook the functional gaps and inefficiencies embedded within these platforms [15]. However, from a software engineering and systems design perspective, these issues can be clearly identified and addressed through more advanced and intelligent solutions.

As part of this study, a comparative analysis was conducted between the two selected systems, focusing on their functionality, real-time responsiveness, user accessibility, and effectiveness in handling emergency scenarios—such as the immediate need for ambulance services or roadside assistance [16]. These observations have been documented and structured into a comparison chart to highlight the differences between the existing solutions and the system proposed in this study [17].

The results of this comparison indicate that while existing systems offer a basic level of utility, they fall short in critical areas such as live availability of service providers, real-time user tracking, and automatic matching based on proximity and need [18]. In contrast, the system proposed in this research demonstrates a higher degree of sophistication, particularly in emergency and time-sensitive situations. It leverages real-time data integration, location awareness, and dynamic service matching to ensure users can access immediate help with minimal effort [19].

Therefore, the proposed model not only addresses the weaknesses of current solutions but also enhances the overall user experience by providing smarter, faster, and more reliable access to necessary services [20]. This marks a significant step forward in developing urban support systems that are not only technically sound but also genuinely user-centric, especially in urgent or unfamiliar situations. A comparative table is presented with the systems available and proposed study in Table 1 below.

Table 1. Comparative Chart for the existing solutions and proposed model

Features	Proposed	Google Maps	Open Street Maps
Restaurant	Y	Y	Y
Pharmacy	Y	Y	Y
Workshops	Y	Y	N
Food	Y	Y	Y
Groceries	Y	Y	N
Car Maintenance	Y	N	N
Online Helpers	Y	N	N

3. Methodology

It is essential for any system to be accurately and thoroughly modeled before the development phase begins. Proper planning ensures that the system meets user requirements and functions efficiently. To achieve this, various technical and functional aspects must be carefully considered [21]. This chapter presents a comprehensive system analysis supported by visual representations, including UML diagrams, class diagrams, activity diagrams, database schemas, entity-relationship (ER) diagrams, and flowcharts [22]. These tools are used to illustrate the system architecture and workflows in detail.

Feasibility study is a critical component of the development process [23]. Its primary goal is to determine whether the proposed system can be successfully implemented and to identify both potential challenges and expected benefits. Technical feasibility evaluates the skills of the development team, focusing on their ability to collaborate effectively and utilize their technical expertise to complete tasks successfully. Based on the technical assessment, a web-based system supported by an Android mobile application is considered suitable for this project [24].

One of the more complex challenges involves calculating the shortest route to service providers, particularly across dynamic road networks. Despite this, the Android application will serve as a practical and user-friendly interface for accessing the system's services. The first step for any user is to register within the system, ensuring secure and authenticated access. Once registered, users can access the application via an internet-connected mobile device (3G/4G or higher) [25].

Upon entering a city, users can input their specific service needs into the application. The system will then search and display all relevant services and service providers available nearby. After reviewing the available options, the user can apply for the required service directly through the app. The system will highlight users or service providers who are currently online and active in the vicinity. Depending on the user's location and the nature of the service requested, the nearest and most suitable providers will be displayed in real-time. Finally, service providers in the

area can respond to these requests, help, and confirm their availability, ensuring prompt and reliable support to users in need. The use case modelling is represented below as Figure 1. For Use case diagrams, Figure 2, 3 for Activity Diagram, Figure 4 for ER Diagram and Figure 5 for the Complete modules presented in this study.
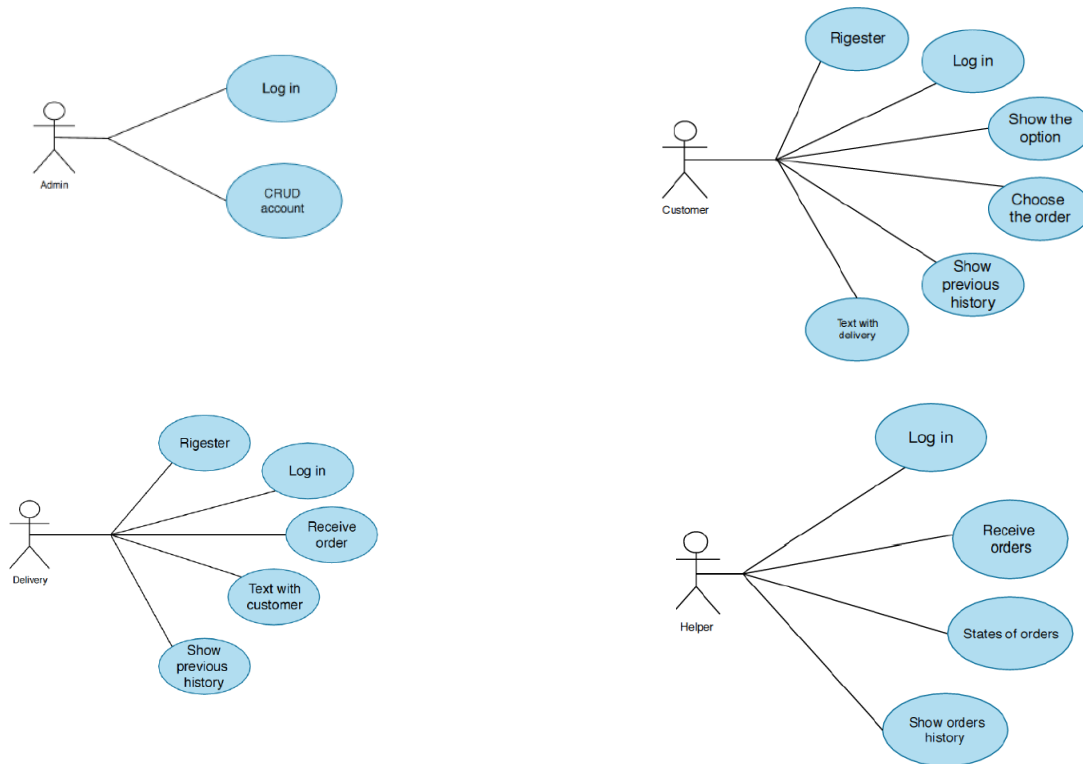
3.1. Use Case Diagram

Figure 1. Several Use cases of the proposed system
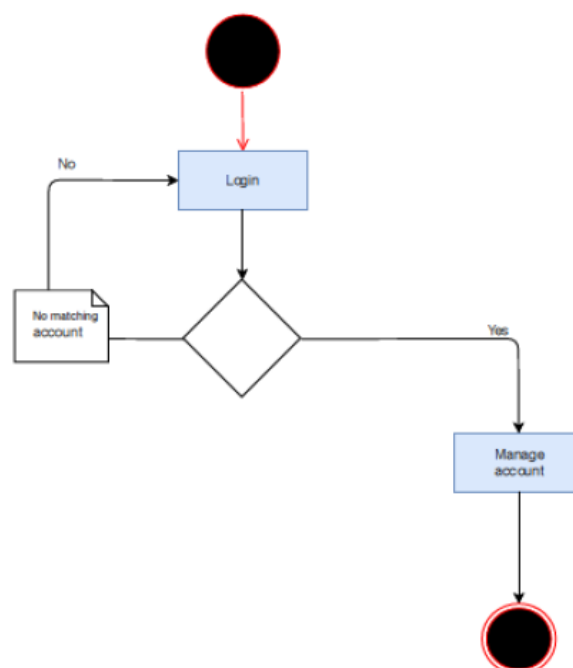
3.2. Activity Diagram

Figure 2. Login Activity Diagram
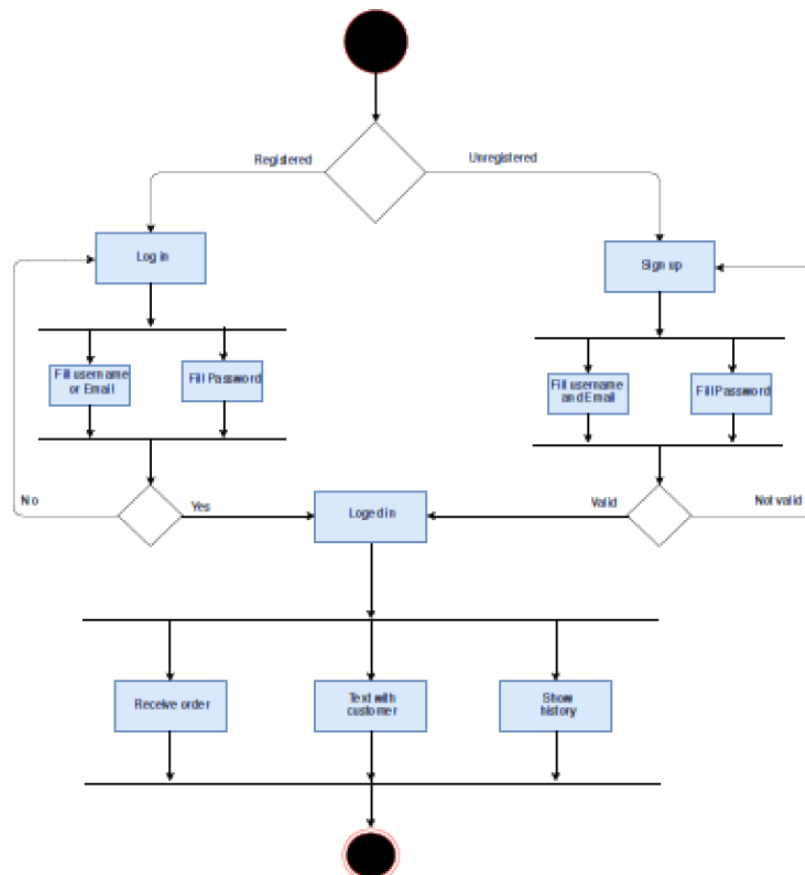
Figure 3. Activity Diagram for the working system (Complete)
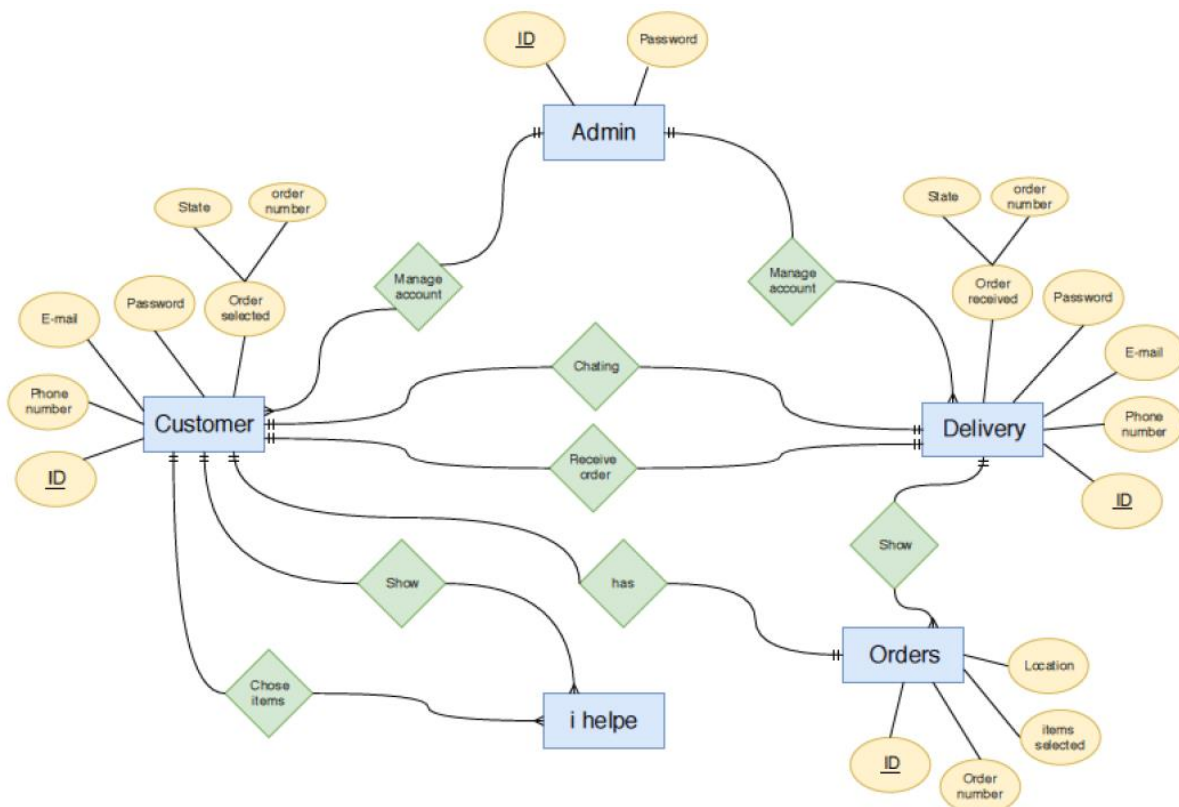
3.3. Database Modelling

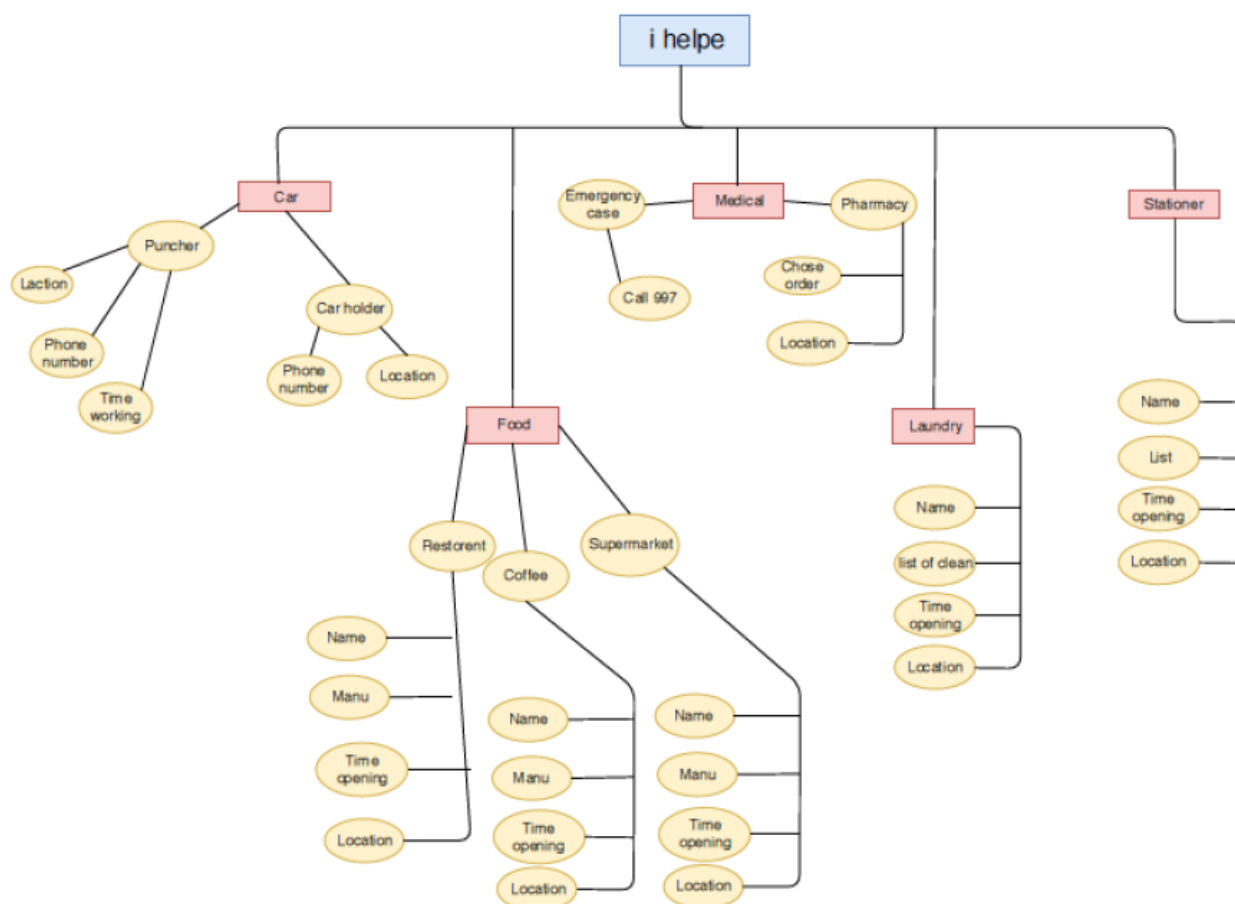**Figure 4.** ER Diagram for the working system

Figure 5. Complete Use Cases for the system proposed

3.4. Tools and Software Required

All the tools needed for the development of the proposed system are mentioned in Table 2 below.

Table 2. Tools needed for development

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

4. Conclusion

In conclusion, navigating an unfamiliar city can be a challenging experience, especially when timely access to essential services like food, healthcare, markets, and workshops is required. While existing tools such as digital maps offer basic location-based assistance, they fall short in delivering real-time, context-specific information and direct connectivity with local service providers. The proposed system aims to bridge this critical gap by creating an integrated platform that not only identifies nearby services but also facilitates real-time interaction with vendors and providers. This system is envisioned to act as a personalized digital guide for travelers, offering ease, accuracy, and convenience in accessing necessary services during their stay.

5. Future Directions

1) **Enhance system intelligence** using machine learning and AI to predict user needs based on behavior and context.

2) **Incorporate real-time data** from IoT devices and local businesses to improve the accuracy and relevance of recommendations.

3) **Expand the system** to include multilingual support and accessibility features for greater inclusivity.

4) **Collaborate with municipal authorities** and local service providers to enable dynamic scaling and updates of the system.

5) **Evolve the platform** into a vital tool for tourism, emergency response, and urban planning in smart cities.

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