IJEMD-CSAI, 3 (1) (2024), 1 – 9 https://doi.org/ 10.54938/ijemdcsai.2024.03.1.284

International Journal of Emerging Multidisciplinaries:
Computer Science and Artificial Intelligence

Research Paper
Journal Homepage: www.ojs.ijemd.com
ISSN (print): 2791-0164 ISSN (online): 2957-5036

Porter Information System Based on Oman

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Abstract

The Online Porter Service functions as a virtual platform catering to users' needs. Its primary objective is to highlight individuals requiring assistance in transporting their belongings from one location to another. Within this framework, the user inputs specific details regarding the dimensions and pick-up as well as drop-off locations of the shipment. This information is subsequently forwarded to the closest available driver within the vicinity, who then proceeds with the delivery. Our intention is to maintain the driver's presence in the designated area for a certain duration, ensuring their readiness in the event of additional service requests. This approach streamlines and expedites the process for both clients and drivers, facilitating the smooth execution of their tasks.

Key-words: Online Porter Service, virtual platform, users' needs, transportation assistance, dimensions, pick-up, drop-off locations, shipment.

INTRODUCTION

“The Internet has promoted interpersonal communication, especially between producers and consumers of goods,” said D.V. Danilenko.

In the contemporary landscape of digital services, the advent of online platforms has revolutionized various aspects of daily life, including transportation and logistics. Among these innovative solutions is the Online Porter Service, a virtual platform designed to meet users' needs by facilitating the transportation of belongings from one location to another.

The primary objective of the Online Porter Service is to address the challenge of transporting belongings by connecting users with available drivers in their place. Through a user-friendly

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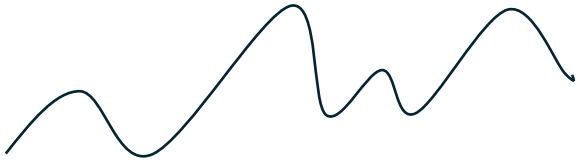
interface, individuals can input specific details such as dimensions and pick-up/drop-off locations of their shipments. This information is then swiftly relayed to the closest available driver, who undertakes the task of delivery.

In this paper, we aim to provide a comprehensive understanding of the Online Porter Service's operational model and its implications for modern transportation and logistics. By examining the mechanisms through which this platform streamlines and expedites the delivery process, we shed light on its potential to revolutionize traditional service paradigms in the digital age.



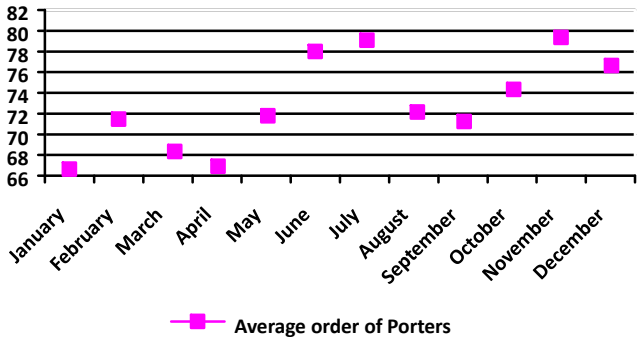


Chart - 1: Porter Order Data

For any systems running manually the porter is contacted when seen or by calling a phone number which causes a delay in reaching everyone at necessary time. As we can see, the order rate changes from month to another based on the request for the porter. For that it may not be able to fulfil all the tasks or calls for customer at the time specified.

Research Problems

Based on the brief explanation of the system described above:

1. How do you design a porter application that can connect customers and porters?
2. How to build a porter application so that customer goods can be delivered by the porter and recorded and monitored properly?
3. How is the process flowing in ordering and getting the porter in accordance with the time the customer wants?

Objectives and Benefits

The Online Porter Service encompasses various objectives aimed at providing efficient and reliable transportation services to users while ensuring the satisfaction and engagement of both users and drivers. Here are additional objectives for the Online Porter Service:

User Experience Optimization: Investigate user feedback and behavior to identify pain points and areas for improvement in the platform's interface and functionality, aiming to enhance the overall user experience.
Driver Allocation Efficiency: Analyze the effectiveness of the algorithm used to assign drivers to service requests based on proximity and availability, with the goal of optimizing resource allocation and minimizing wait times for users.
Service Reliability and Timeliness: Assess the reliability and timeliness of service delivery by tracking metrics such as delivery times, fulfillment rates, and incidents of missed or delayed pickups/drop-offs.
Driver Retention Strategies: Explore factors influencing driver retention, satisfaction, and motivation within the Online Porter Service platform, and develop strategies to improve driver engagement and loyalty.
Geospatial Analysis: Conduct geospatial analysis to identify patterns and trends in service demand, driver availability, and traffic conditions across different regions, informing strategic decision-making and resource allocation.

System Description

In this research we try to design a suitable prototype for this system and to specify and explain its important applications, functions, services, database, and requirements, as well as its multimedia and technology.

SDLC Waterfall

The waterfall model is a linear, sequential approach to the software development lifecycle (SDLC) that is popular in software engineering and product development.

The waterfall model uses a logical progression of SDLC steps for a project, similar to the direction water flows over the edge of a cliff. It sets distinct endpoints or goals for each phase of development. Those endpoints or goals can't be revisited after their completion.

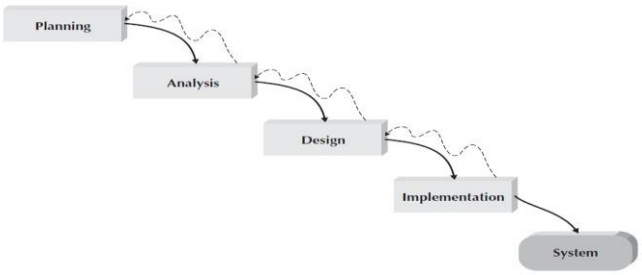


Fig - 1: SDLC Waterfall

1. **Planning**

Planning the waterfall project means knowing every one of those tasks, no matter how small, and how they lead to your final deliverable. A work breakdown structure is a tool to help you figure out all those steps.

2. **Analysis**

The system specifications are analyzed to generate product models and business logic to guide production. This is also when financial and technical resources are audited for feasibility.

3. **Design**

A design specification document is created to outline technical design requirements, such as the programming language, hardware, data sources, architecture, and services.

4. **Implementation**

The source code is developed using the models, logic and requirement specifications designated in the prior phases. Typically, the system is coded in smaller components, or units, before being put together.

Manual and Proposed System

Manual Way (traditional way)

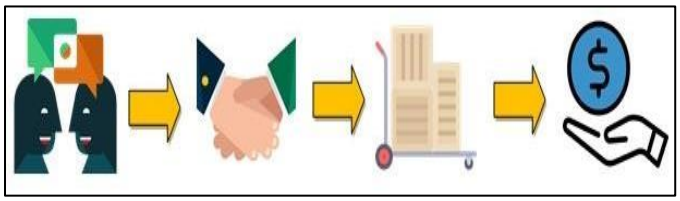


Fig - 2: Manual Way

Explanation from the picture above:

1. Customers make transactions with porters.
2. Customers with porters agree with the transaction.
3. Porters deliver goods in accordance with the agreement.
4. The customer pays for the porter after the goods have been delivered at the agreed price.

Problem Analysis

Identifying problems found in the current porter ordering activity can be done by analyzing performance, information, economy, application security, and efficiency. From this analysis, there are usually several problems and finally, we can find the main problem and some solutions to the problem. The SWOT analysis stage on the current porter ordering activity that will be used is comparing the old way with the system that will be made.

	Traditional	**Proposed**
Strengths	- The number of porters allows customers to choose.	- -With the application, customers are made it easier in ordering porters whenever they want. - Porters don't need to go around offering services.
Weakness	- Sometimes customers still have trouble getting a porter. - Searches that are still manual are time consuming.	- Streamlining the relationship between porters and users.
Opportu -nities	- From the average data of the porter's order, it can be concluded that the porter is needed. - Creating jobs.	- Making porter needs reports easier. - With the details of the order in the application, it makes it easier for the porter to know the type of item he is going to transport.
Threats	Porters often fight over customers.	The porter is more organized in serving.

System Architecture and Network

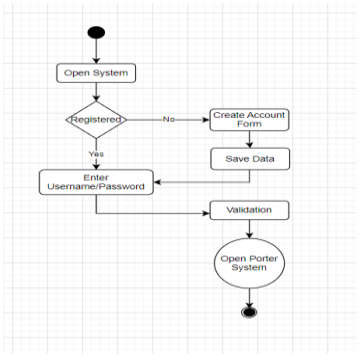
A driver app meant to facilitate the transfer of items from one location to another, the system architecture and network would encompass several key components:

1. Client-Side Application: This includes the driver's app interface installed on the driver's smartphone or device. It allows the driver to interact with the system, view pickup and drop-off locations, manage deliveries, and communicate with customers.

2. Server-Side Application: The backend infrastructure consists of servers, databases, and application logic responsible for coordinating and managing delivery requests. It handles tasks such as matching drivers with delivery requests, tracking orders, and updating the status of deliveries.

3. Communication Protocols: Various communication protocols are used to facilitate data exchange between the client-side application and the server-side application. This may include HTTP(S) for transmitting data over the internet, WebSocket for real-time communication, or other protocols optimized for low-latency and secure data transfer.

4. Database: The system typically includes one or more databases to store information such as user profiles, delivery requests, item details, and transaction records. These databases ensure data consistency, integrity, and availability throughout the system.



1. Authentication and Authorization: To ensure secure access to the system, authentication mechanisms such as username/password, OAuth, or biometric authentication may be implemented. Authorization controls define what actions users (both drivers and customers) can perform within the app.

2. GPS and Mapping Services: The app likely integrates with GPS and mapping services to provide real-time location tracking of drivers, route optimization for deliveries, and accurate pickup/drop-off location information.

3. Notification Services: Notification services are used to keep users informed about the status of their deliveries, including order confirmations, pickup/drop-off alerts, and delivery completion notifications.

Use Case Diagram

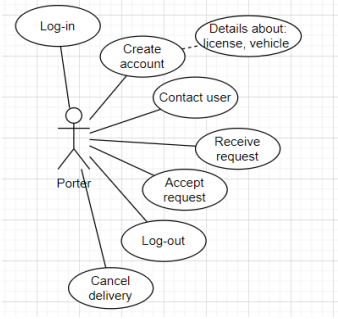


Fig - 3: Proposed Use Case

A use case diagram is a visual depiction of the interactions between a user and a system. It illustrates how customers engage with the system, outlining the connections between the system and the user, specifically the "customer." This diagram helps outline the relationships among use cases, systems, and actors, summarizing their interconnections.

Activity Diagram

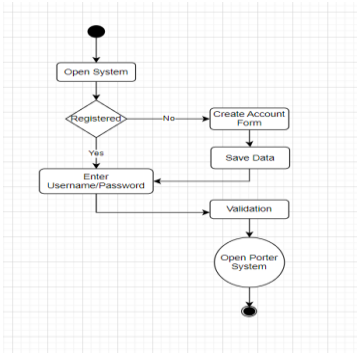


Fig - 4: Activity Diagram

The activity diagram illustrates the steps a customer can take to utilize the interface. If the customer is already a registered user in the system and wishes to log in, their username and password are verified against the database. If the provided credentials match, the customer can successfully log in; otherwise, they must first register by entering their information and then proceed to log in

Sequence Diagram

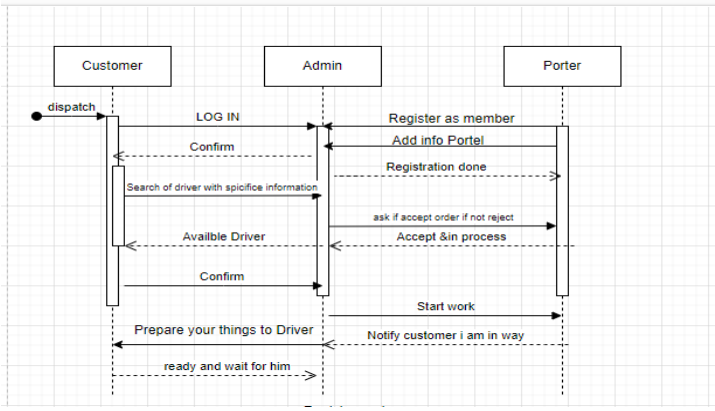


Fig - 5: Sequence Diagram

The sequence diagram shows the functions that customers can perform in the Porter system, where a customer can perform several orders.

Implementation

DISCUSSION

In regions like the GCC countries, the adoption of delivery apps for transferring items is not widespread due to significant barriers such as high implementation costs and technical intricacies. This lack of utilization poses severe consequences, including increased expenses associated with traditional transportation methods and, critically, delays in item delivery that could result in logistical challenges and economic losses. This paper proposes a straightforward design for a

delivery app system to address these issues and streamline the process of transferring items from one location to another efficiently and cost-effectively.

CONCLUSION

The paper proposes a prototype design for a cooperative delivery system aimed at connecting various regions within the GCC countries and linking them to professional delivery services globally, facilitating seamless item transfers through a driver app platform. The system emphasizes simplicity, affordability, and robust security measures as its core features. However, a potential challenge lies in ensuring the confidentiality of sensitive delivery data stored in the system's database, particularly given the public nature of internet technology. Additionally, the transmission of multimedia data, such as images or videos related to deliveries, may encounter quality issues during transfer. Despite these challenges, implementing such a delivery app system would address the inefficiencies and costs associated with traditional transportation methods, thereby improving logistical operations and economic outcomes within the GCC countries and potentially beyond.

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