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Unified Delivery Platform for Seniors and Differently Abled People

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Abstract: *This paper presents the design and development of an inclusive web-based platform aimed at supporting elderly and disabled people in managing their daily needs. Many existing digital service applications are difficult for these user groups to navigate due to complex interfaces, small text etc. The proposed system addresses these challenges by providing a simplified and user-friendly interface tailored to their specific requirements. The study emphasizes the importance of inclusive digital design and demonstrates how accessible technology solutions can reduce barriers and improve the quality of life for vulnerable user groups.*

Keywords: Accessible delivery system, Elderly assistance, Disability support, Inclusive design, Emergency delivery.

I. INTRODUCTION

In today's modern world, online delivery platforms have become very essential for meeting day to day errands. They offer a variety of options ranging from groceries, personal care products, household essentials etc. Such apps have proved to be very useful and one of the main advantages is that it saves a lot of time and you can get the products delivered right at your doorstep. But here's the thing- these apps are extremely helpful for people who are digitally literate i.e people who know how to use these apps and find what they want.

The existing apps don't take into consideration the part of population that may actually benefit from such platforms- Senior citizens and Disabled individuals. The main problem is these apps have complicated interfaces which are difficut to navigate, the written text is small in size and all of these factors are reasons why people with impaired mobility, vision and cognition hesitate or don't feel comfortable while using these apps. They have to constantly rely on their family members for support.

It is indeed crucial to develop platforms that can assist elders and disabled people. This paper suggests a web application designed with features like voice assisted navigation, care-giver support, emergency priority delivery, high contrast interfaces, custom font and button sizes etc. all of which makes it incredibly easy to use. The frontend is built with HTML, CSS and javaScript while the backend support is established by Python Flask and MySQL. This ensures that elders and disabled people are not dependent on others and manage to get daily essentials, medicines etc. in a simple, safer and comfortable manner.

II. LITERATURE REVIEW

[1]Jieting Zhu et al. (2023) investigated the cognition and usage status of smart lederly care apps by elders and medical staff in China. They conducted a web-based hybrid survey through which they found out that usage rate is low, but the demand for such apps is huge. Respondents are mainly concerned with app function settings, interface simplicity, and data security.

[2] Bing Ye et al. (2023) wanted to understand the landscape of existing mobile apps in dementia care for people living with dementia and their caregivers with respect to app features, usability testing, privacy, and security. The reports

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showed a positive experience of interacting with the apps. However, the design and privacy concerns that should be accounted for in future research.

[3] Joo Chan Kim et al. (2021) propose and develop an AR and IoT enabled healthcare system which can be used by caregivers to assist the elderly on a daily basis. It is based on smartcity IoT middleware platform and provides a standardized, intuitive and non-intrusive way to deliver elderly person's information to caregivers.

[4] Fabio Masina et al. (2020) aimed to investigate whether cognitive and/or linguistic functions could predict user performance in operating an off-the-shelf voice assistant.

[5]Shresth Agarwal et al. (2023) explore the application of voice assistants in improving accessibility and independence for physically challenged individuals. They suggest that a specialized voice assistant has the potential to revolutionize the way disabled people engage with technology and their environment by utilizing cutting-edge voice recognition, natural language processing, and machine learning techniques.

[6] Nadine Vigouroux et al. (2022) conducted a study on tactile and vocal interaction modes for home automation control of equipment at home for different profiles of disabled people. This study shows that there is real need for multimodality between touch and voice interaction to control the smart home. This study also shows that there is need to adapt the interface and the environment to the person's disability.

[7] Sanjeev Kumar Katara et al. (2025) discuss about what assistive technologies are available to people with disabilities, and how these assistive technology improves their living conditions.

[8] J.A.D.C.A Jayakody et al. (2017) have developed a mobile application called 'E-Shopper' The app shows the nearest branch of the particular supermarket for the customer's location by using outdoor navigation. Moreover, a delivery method is also provided by the application to make it more convinient for the customer.

[9] Nicolaus Droutsas et al. (2024) emphasize that the Web is still largely inaccessible for a plurality of reasons (e.g. poor navigation, lack of/unsuitable alternative text, complex Web forms) with significant impact on disabled users. They present a scoping review of the Web accessibility research landscape.

[10] Marlou Kerkxex D. Rentucan et al. (2024) discussed that senior citizens face unique challenges in using technology enabled products and services due to age-related issues. Results indicated difficulty on navigating and understanding the website, prompting the opportunity to develop UX action plans for senior citizens.

III. METHODOLOGY/EXPERIMENTAL

1)Overall Approach

To develop the Unified Delivery Platform for seniors and differently abled people, a step-by-step and user-focused development approach was followed. The entire system was divided into three main parts: user interface (frontend), server-side logic (backend), and data storage (database). Factors like simplicity, accessibility, ease of use were kept in mind while developing so that the elderly and disabled people can use it without any difficulty.

2) Frontend Development

The user interface was developed using HTML, CSS, and JavaScript. HTML was used to create a clear and well-structured layout so users can easily navigate the application. CSS was applied to design large readable fonts, high-contrast color combinations, and big buttons for easier interaction. Responsive design techniques were used so that the application is compatitble with all devices like phones, tablets and desktops.

3) Backend Development

The backend of the system was implemented using Python Flask. Flask was selected because it is lightweight, flexible, and easy to integrate with databases and external services. It acts as the central controller that receives requests from users and sends appropriate responses.

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The backend manages user authentication, order processing, payment handling, caregiver notifications, and emergency delivery requests. Security measures such as encrypted passwords and input validation were added to protect user data and prevent unauthorized access.

4) Database Design

The system uses MySQL database software to store all important information. This includes user details, caregiver contact information, product lists, order history, and payment records. The database was designed in a structured manner so that data can be quickly stored and retrieved when required. Proper relationships between tables were maintained to ensure data accuracy and consistency.

5) Voice Support and Accessibility Features

To make the system more accessible, voice-assisted interaction was added using browser-based speech recognition tools. This allows users to search for products, place orders, and check order status using voice commands. Other accessibility features such as adjustable text size, simple navigation, and large clickable buttons were also implemented to support users with visual or motor difficulties.

6) Experimentation and Testing

After development, the system was tested to ensure that it works correctly and is easy to use for the target users.

Functional Testing

All major features such as user registration, product selection, order placement, payment processing, order tracking, caregiver alerts, and emergency delivery were tested. Each function was checked individually and then tested again after integration to confirm smooth overall operation.

Performance Testing

Performance testing was done to check the response time of the server and the reliability of the system during multiple requests. The platform showed stable performance under moderate load, making it suitable for small-scale real-world use.

FIGURES

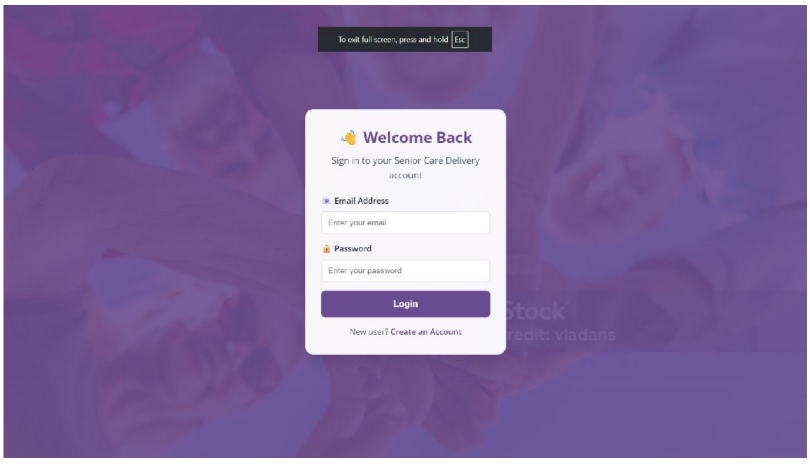

Fig. 1 Login interface of the proposed Unified Delivery Platform designed for seniors and differently abled users, showing a simple, high-contrast layout with secure access and user-friendly input fields.

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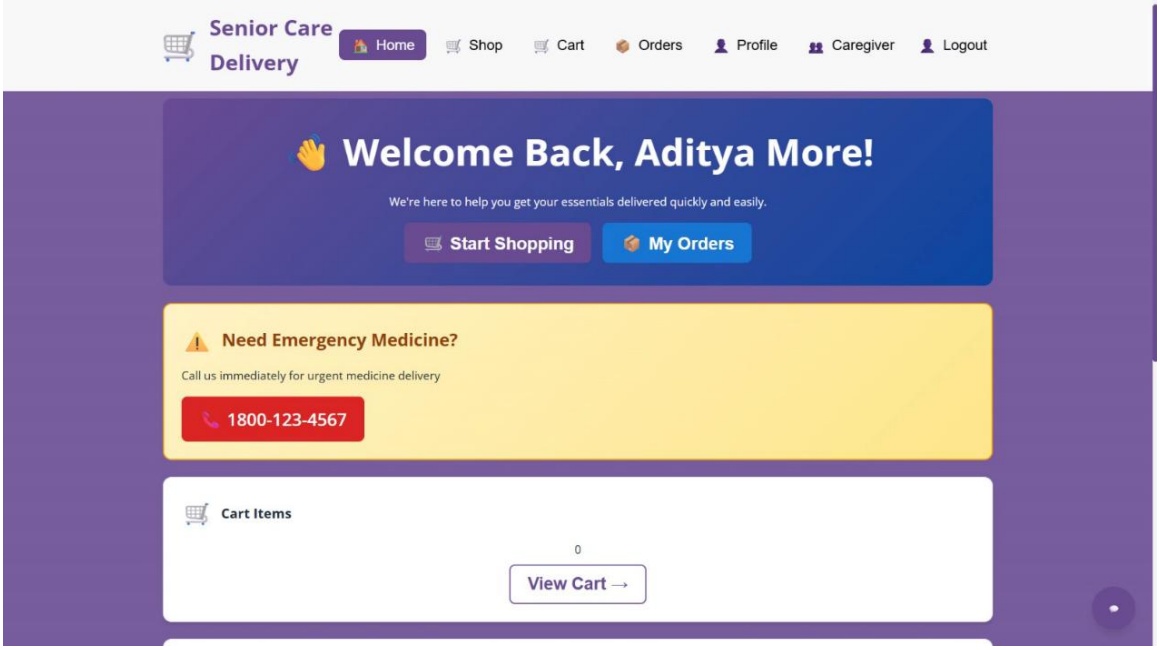

Fig. 2 Home dashboard of the Unified Delivery Platform after user login, showing quick access to shopping, order tracking, emergency medicine support, and cart overview with user-friendly and accessible interface.

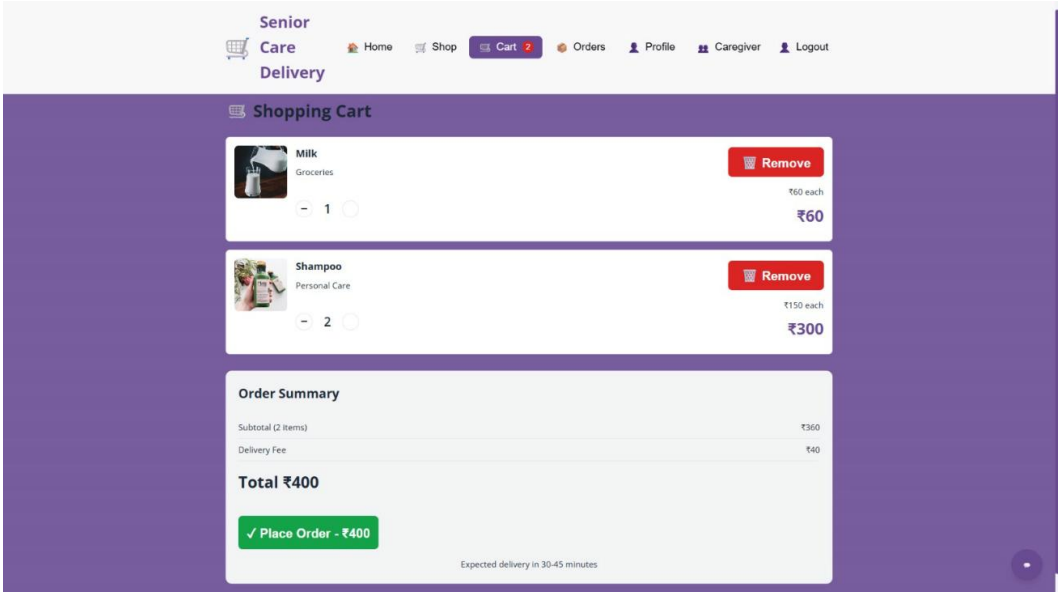

Fig. 3 Shopping cart and order summary interface of the Unified Delivery Platform, showing selected items, quantity control, price calculation, and simplified one-click order placement for elderly and differently abled users.

IV. RESULTS AND DISCUSSIONS

The put forward Unified Delivery Platform underwent various tests to check its functionality, usability, accessibility, and performance. In fact, all major features such as user login, product ordering, payment processing, order tracking,

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caregiver alerts, and emergency order handling were carried out successfully without any system failure. The one-click repeat order function was always operational, and it was instrumental in the reduction of the time necessary for frequently repeated orders.

The backend system was indeed robust during the test. API response time and database query performance stayed to be very efficient even when several users were simultaneously accessing the system.

To sum up, the findings strongly suggest that the proposed platform is a viable tool to enhance the accessibility, independence, and delivery of reliability of elderly and differently abled individuals. Even though the system functions properly at a prototype level, it will be possible to add features such as multilingual support, better speech recognition accuracy, and deeper health-care integration in the future to extend its practical influence.

V. FUTURE SCOPE

1) Health and Medication Integration:

The platform can connect with medicine reminder systems, digital prescriptions, as well as basic health monitoring features to provide medication on time and good health management for elderly users.

2) Multilingual and Mobile Expansion:

The system can be developed to support multiple languages and can be deployed across platforms like Android and iOS.

3) AI-Based Personalization and Emergency Integration:

Artificial intelligence can be employed for smart product suggestions, predictive reordering, and enhanced voice recognition. Additionally, the integration with hospitals, pharmacies, and emergency response services can make the platform more dependable in crises.

VI. CONCLUSION

This research paper discussed a platform called Unified Delivery Platform made to give seniors and differently abled people easy, accessible, and reliable delivery of necessary items. The system through features like a user-friendly interface, voice assistance, caregiver support, one-click repeat orders, and an emergency delivery option reduces users' dependence on others and thus increases their independence. The platform has been effectively developed with HTML, CSS, JavaScript, Python Flask, and MySQL, and the test results indicate that it is stable, user-friendly, and can be realistically deployed at a prototype level.

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