Dedicated Delivery Platform Based on the User Experience of the Visually Impaired

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Abstract—As the online food-delivery market expanded rapidly after the COVID-19 pandemic, mobile ordering platforms became mainstream. However, the functions and user interfaces (UIs) of existing delivery services were largely designed from the perspective of non-disabled users. Interviews with visually impaired users further revealed that the complexity of current delivery applications leads to substantial time and effort during routine ordering tasks. To address this problem, this paper presents *BBlink*, a user-experience-centered delivery platform designed for visually impaired users. Based on interviews and observations, the platform differentiates itself through a simplified service flow, customized interface modes, and enhanced accessibility. The proposed system aims to make food-delivery services easier to use for visually impaired users and to motivate the development of additional services that support independent daily living for people with disabilities. As an extension of this work, the paper also suggests future research on improving kiosk accessibility for visually impaired users.

Figure 1: *BBlink* logo.

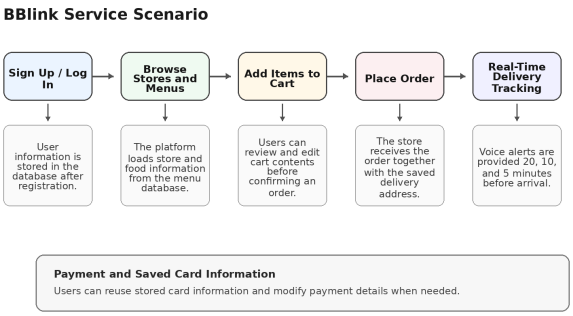

Figure 2: Overall service scenario of *BBlink*.

1. Introduction

The food-delivery market has grown rapidly since the COVID-19 pandemic. According to Statistics Korea, mobile orders accounted for 96.4% of the transaction volume of food-delivery services in 2020 [1]. In other words, the paradigm of delivery ordering has shifted from telephone-based services to mobile-application-centered services. However, existing delivery platforms contain a large amount of information that is difficult for visually impaired users to understand through voice assistance alone, including numerous stores, option settings, dynamic motions, and advertising banners. As a result, visually impaired users often spend excessive time navigating such platforms.

In this study, we propose *BBlink*, a platform that provides a specialized UI for visually impaired users. *BBlink* is a web service developed with React and Django and deployed as an open-source web application. The functions and UI of the platform were designed on the basis of interviews with visually impaired users so that the service would directly reflect user requirements.

To identify the inconveniences and possible improvements in existing delivery platforms for the main target user group, we conducted interviews with visually impaired users with the support of the Rehabilitation Support Center for Adventitious Visual Impairment of the Korea Blind Union. The main findings are summarized in Table 1. In this work, we provide specialized user modes that distinguish between totally blind users and users with low vision. Considering that the proportion of totally blind users is relatively small and that most visually impaired users have low vision [2], the current implementation places particular emphasis on the low-vision mode in its feature design and UI composition.

2. Main Body

2.1. Service Scenario Based on User Experience

The overall service scenario of *BBlink* is shown in Fig. 2. When a user signs up, the provided information is stored in the database, and the registered user can subsequently log in to the platform. Through the database containing store and menu information, the user can browse available foods and examine details of each menu item. The user can then add desired items to the cart and later review or modify the cart contents.

When the user decides to place an order, the platform sends the selected menu information to the store on the basis of the address stored in the user database. For payment, the user may use previously saved card information, which can also be added to or modified later. After the order is completed, the user can quickly check the delivery status in real time and receive voice notifications 20, 10, and 5 minutes before arrival.

2.2. Software Architecture and Technology Stack

Figure 3 illustrates the software architecture and the technologies used in *BBlink*.

- **Data construction and management**: Information about stores and menu items was collected by crawling the Yogiyo website with Selenium and stored in a MySQL database. The database was then deployed on an AWS instance for cloud-based use.

Table 1: Key interview findings and corresponding design implications.

Category	Interview finding	Observed user need	Design implication in *BBlink*
Delivery app usage	Users rely on a small number of familiar delivery apps and repeatedly order from a stable set of stores.	Frequent actions should be accessible without repeated exploration.	Support shortcuts for frequently used stores and frequently ordered menus.
Option selection	Selecting menu options during ordering takes considerable time.	The ordering flow should minimize repeated decision steps.	Introduce *Blink Order*, which directly reorders a frequently ordered menu without revisiting the option-selection stage.
Delivery tracking	Checking delivery status in existing apps is cumbersome and often requires repeated screen navigation.	Users need immediate access to order status with less monitoring burden.	Place delivery-status information on the main screen and provide scheduled voice notifications before arrival.
List organization	Predictable ordering of stores and menu items helps users estimate where a target item will appear.	Navigation should support quick orientation and item localization.	Arrange items in Korean alphabetical order rather than irregular platform-defined ranking orders.
Accessibility behavior	Many users are already accustomed to built-in smartphone accessibility gestures and screen-reader workflows.	New interactions should not conflict with existing accessibility habits.	Avoid unnecessary custom motion and instead optimize the UI for built-in accessibility functions.
Overall expectation	Users emphasized saving time and reducing fatigue while completing ordinary ordering tasks independently.	Accessibility should improve both efficiency and autonomy.	Simplify the full service flow and provide separate modes for totally blind users and users with low vision.

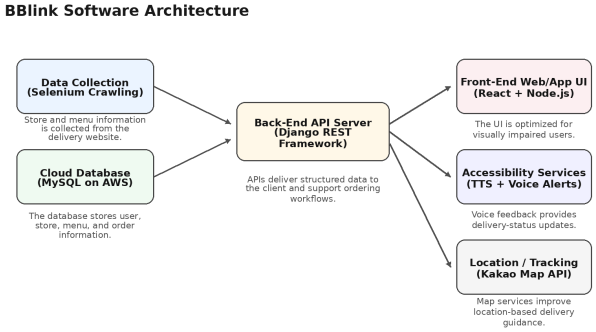

Figure 3: Software architecture and core technologies used in *BBlink*.

- **Back-end**: Using Django REST Framework (DRF), the database contents were converted into APIs and served to the client through a back-end server.
- **Front-end**: React and Node.js were used to design a screen layout specialized for visually impaired users. In addition, the Kakao Map API was used to display delivery locations, while Text-to-Speech (TTS) was used to provide voice alerts and delivery-status updates.

2.3. Platform Design for Solving Pain Points of Visually Impaired Users

The goal of this study is to address the pain points experienced by visually impaired users when using existing delivery platforms. Based on interview feedback, we designed the overall functionality and UI of *BBlink* as follows.

Simplification of the Service Flow. Blink Order allows users to reorder frequently used menus immediately without going through the option-selection process. This feature goes beyond the simple store-favorite function provided by existing delivery platforms because it stores the frequently ordered menu itself.

Simplified delivery-status checking and voice notifications were introduced because interviewees reported that checking delivery or pickup status is cumbersome in existing platforms. *BBlink* therefore places an order-status section directly on the main page and provides voice notifications so that users can grasp delivery progress more conveniently.

User Interface Design for Visually Impaired Users. Alternative text for images is provided because built-in smartphone TTS functions do not sufficiently recognize image data or provide image explanations.

No custom motion design was adopted because many interview participants were already familiar with built-in smartphone accessibility gestures. Rather than adding platform-specific gestures, the UI was designed to better support existing accessibility functions. In addition, because left-right swipe gestures may interfere with TTS usage, the interface replaces such interactions with scroll-down and drop-down patterns where appropriate.

Ordering and sorting strategy was also revised. Existing delivery platforms often display items in irregular orders. *BBlink* instead arranges items in Korean alphabetical order so that visually impaired users can estimate the approximate location of a desired item more easily and reduce service-use time.

Personalized Interface Modes. Visual impairment can be divided into total blindness and low vision. To provide specialized interfaces according to user needs, *BBlink* offers two separate modes: a mode for totally blind users and a mode for low-vision users. The low-vision mode focuses on making visual information easier to perceive, whereas the totally blind mode minimizes visual content and is optimized for more effective use of TTS.

Enhanced Accessibility. Because the service is implemented in an application-like form using a web view, it can be used both on the web and as an app, thereby reducing restrictions on the device used for access.

3. Conclusion and Future Work

3.1. Conclusion

In this study, we developed *BBlink*, a delivery platform that provides a simplified UI so that visually impaired users can independently order food quickly and conveniently. By adding functions not commonly available in existing delivery platforms—

such as Blink Order, simplified motion patterns, and voice notifications for delivery status—the platform is designed to enable visually impaired users to participate in delivery culture more smoothly.

At the time of writing, the store-information database, APIs, ordering service, and TTS-based voice updates for real-time delivery tracking have been implemented. The accuracy of location-based delivery guidance is also being improved through the use of map APIs.

Although this work focuses on a food-delivery platform, the same framework could later be expanded to other domains, such as daily necessities or clothing purchases, thereby further improving the convenience of online consumption activities for visually impaired users.

3.2. Future Research Direction

As an extension of this study, we propose future research on resolving the issues that visually impaired users face when using kiosks. As the domestic kiosk market continues to expand in response to labor-cost pressures, many restaurants are increasingly adopting kiosk-based ordering systems. However, because information accessibility for people with disabilities is still insufficient, visually impaired users often have difficulty dining out alone [3].

To address this limitation, we plan to add an *in-store dining order* function to the proposed platform so that it can be connected with kiosks. Based on prior work on kiosk software, server design, payment, and security, we intend to continue this line of work and share the outcomes through future publications. More broadly, we expect that platform research for visually impaired users can motivate the development of services that reduce the digital divide experienced by socially marginalized groups across a wider range of domains.

Acknowledgment

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