# Designing of Volunteer Reader Mobile Application for Visually Impaired Individuals

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**Abstract**
***Purpose:*** Books are one of the essential tools that have the potential to affect the imagination of every individual, regardless of age group. Books, which have an importance that can directly or indirectly affect the characters and whole lives of individuals, are materials that can be used to develop thinking and social skills. In the context of the content, quality, type, and level of the book read in the research; it is seen that it has positive contributions to the development of the creative thinking skills of the individual. Due to their permanent physical disabilities, visually impaired individuals cannot directly access the literary works they want to access. Visually impaired individuals can access these problems with the help of various tools by paying specific fees. It restricts visually impaired individuals with low care costs and low socio-economic levels from subscribing to various audiobook applications for particular prices.
***Method:*** In this study, we designed a mobile application to enable visually impaired individuals to access literary works for free and offline. The model of the application is based entirely on volunteerism. Through the mobile application developed by the volunteers, the books are read and converted into audiobooks according to the wishes of visually impaired individuals. Furthermore, the application developed for iOS operating systems is free and can work offline.
***Implications for Research and Practice:*** We believe the proposed model will improve the problems faced by visually impaired individuals accessing audiobooks freely and shed light on new researchers conducting innovation-based studies in special education.

**Turkish Abstract: Dijital Sosyal Yardımlaşma Aracılığıyla Görme Yetersizliği Olan Bireyler İçin Gönüllü Okur Uygulaması**
**Özet**
***Problem Durumu ve Amaç:*** Kitaplar yaş grubu fark etmeksizin her bireyin hayal dünyasını etkileme potansiyeline sahip önemli araçlardan biridir. Bireylerin karakterlerine ve tüm yaşamlarına doğrudan ve dolaylı yoldan etki edebilecek öneme sahip olan kitaplar, düşünme ve sosyal becerilerin geliştirilmesinde kullanılabilecek materyaldir. Araştırmalarda okunan kitabın içeriği, niteliği, türü ve seviyesi bağlamında bireyin yaratıcı düşünme becerisini gelişmesinde olumlu katkılarının olduğu karşımıza çıkmaktadır. Kalıcı fiziksel engellerinden dolayı görme engelli bireyler erişmek istedikleri edebi eserlere doğrudan erişememektedir. Görme engelli bireyler yaşadıkları bu problemlere belirli ücretler ödeyerek çeşitli araçlar yardımı ile erişebilmektedir. Hem bakım masrafları hem de sosyo- ekonomik düzeyleri düşük olan görme engelli bireylerin belirli ücretler karşılığında çeşitli sesli kitap uygulamalarına abone olmasını kısıtlamaktadır.
***Yöntem:*** Çalışmada görme engelli bireylerin edebi eserlere ücretsiz ve çevrimdışı erişebilmelerini sağlamak için önemli değerlerimizden biri olan yardımlaşma temel alınarak, dijital sosyal yardımlaşma modeli önerilmiştir. Dijital sosyal yardımlaşma modeli tamamen gönüllülük esasına dayalı olup gönüllü kişilerin geliştirilen mobil uygulama aracılığı ile görme engelli bireylerin isteklerine göre kitapları okuyarak, sesli kitaba dönüştürmektedir.
***Bulgular ve Sonuç:*** İOS işletim sistemleri için geliştirilen uygulama ücretsiz ve çevrimdışı çalışma özelliğine sahiptir.

***İleriye Dönük Araştırma ve Uygulama İçin Öneriler***: Önerilen modelin görme engelli bireylerin kültürel ihtiyaçlarını karşılama konusunda yaşadıkları sorunları iyileştireceği ve dijital sosyal yardımlaşma uygulamalarının önünü açacağı düşünülmektedir.
***Anahtar Kelimeler***: *Sosyal yardımlaşma, görme yetersizliği, gönüllü okur, mobil uygulama*

## Introduction

According to the research conducted by the Turkish Statistical Institute (TÜİK) in 2011, there are 1.039.000 individuals with visual difficulties in our country. As can be seen from the figures, it is vital to ensure that these individuals live together with society without breaking away from it.

Visually impaired individuals, like other individuals, need to have a job, to know different fields, realize themselves, and participate in society. Therefore, visually impaired individuals who want to do various readings to gain knowledge in different areas have equal rights as other individuals (İhsan, 2020).

Visually impaired individuals face various problems in reading books. Visually impaired people cannot access information through reading and cannot learn how to read a book (Atay, 2011). Therefore, it is necessary to prevent visually impaired individuals from getting away from books and to increase awareness of books (Şahin, Sevim, Çiğdem, & Aydın, 2011). It is difficult for a visually impaired person to read using their finger. To improve the reading skills of these individuals, reading aloud skills need to be developed (Akçamete, 1988). It is possible to develop language skills, which are important for visually impaired and disabled individuals to live harmoniously and communicate in society, through auditory materials (Özaltun & Erdem, 2020; Şenel & Topuzkanamış, 2018).

## Literature Review

Various environments can be designed, or software can be developed to help visually impaired individuals gain the love of reading books with technology (Iyigun & Tortop, 2018). The education of visually impaired individuals is usually given in special education institutions, and the responsibility of the person who takes care of the disabled individual is relatively high to reinforce the skills gained in these learning environments (Hebebci, 2017). Therefore, specially designed programs, settings, and technologies are needed to facilitate the lives of visually impaired individuals with different characteristics and needs and to improve their quality of life (Selçuk, 2016). However, it is seen that the annual fees of audiobook applications, one of the methods used by visually impaired individuals to improve their reading skills, are high. Information on platforms hosting audiobook content and their annual fees are given in Table 1.

**Table 1**

*Information on Platforms Used to Access Audiobook Content*

| | Digital Platform | Official Web Page | Annual Subscription Fee |
|---|---|---|---|
| **1** | Spotify | www.spotify.com | 99 $ |
| **2** | Apple Music | www.apple.com/tr/apple-music/ | 99 $ |
| **3** | Audioteka | www.audioteka.com | 30 $ |
| **4** | StoryTel | www.storytel.com | 40 $ |
| **5** | Audible | www.audible.com | 96£ |
| **6** | SerialBox | www.serialbox.com | 60$ |
| **7** | KitUp | www. kitup.net | 40 $ |

As can be seen from Table 1, annual fees for audiobook applications are quite high for visually impaired individuals with low socio-economic status. For visually impaired individuals to easily access audiobooks with high prices, the problems they experience need to be improved. To improve this problem, environments, where audiobooks will be offered free of charge by volunteer readers can be designed within the scope of social assistance work.

## Method

This project aims to develop a mobile application to enable visually impaired individuals to access literary works free and offline using Swift Programming Language for iOS. Individuals who have problems accessing paid audiobook platforms due to their visual impairment or disability register in the system and request books from volunteer readers to be recorded. Volunteer readers upload the books to the system as audio files by vocalizing them according to their book requests.

## Operation Mode of Mobile Application

The volunteer reader mobile application that supports the iOS operating system for visually impaired individuals consists of sections.

Login – Giriş Yap - Visually impaired individuals and volunteer readers log in to the platform with the Login section.

Register – Kayıt Ol - With the Register section, visually impaired individuals and volunteer readers register and become members on the user platform.

Listen to the Audiobook – Kitap Dinle - In the Listen to the Audiobook section, there is a list of books recorded by volunteer readers. The user first searches this section for the book he wants to listen to via the application.

Record for Me – Benim için Seslendir - In the Record for Me section, the visually impaired individual enters information about the book they want to listen to. This information is recorded on the platform to be forwarded to volunteer readers.

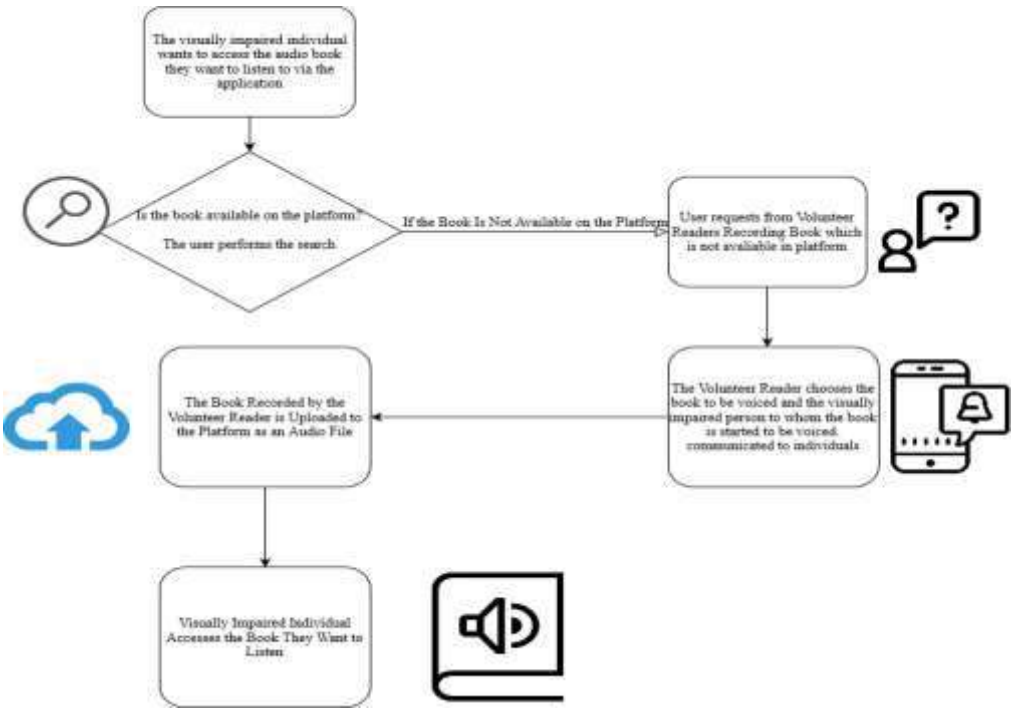
Book Requests – Benim için Seslendir - In the Book Requests section, some books are requested to be read by visually impaired individuals to the volunteer reader. The volunteer reader chooses the book he can sing. A notification is sent to the account of the visually impaired individual that the book has started to be recorded. Volunteer readers record the book as an audio file and turn it into a single file. Uploads the audiobook file to the system. The audiobook uploaded to the system is also listed in the Listen Books section.

## Flow Chart of Mobile Application

Summary information about the operation mode of the designed application is given in the flow chart in Figure 1.

**Figure 1**

*Flow chart of Mobile Application*



## Testing Phase of Mobile Application

The researchers created the criteria for the performance that the application should exhibit during the testing process. These criteria consist of visually impaired individuals searching for a book in the mobile application, submitting the book request, and uploading the audiobook read by the volunteer reader to the system as an audio file. Then, during the application's testing process, the mobile application's performance was tested by peer review method by the consultant teacher and seen that the system works in accordance with the criteria.

## Findings

This section includes the findings obtained as a result of the volunteer reader mobile application development that supports the iOS operating system for visually impaired individuals.

**Figure 2**

*Overview of the Application's Home Screen*

**Figure 3**

*Overview of the Application's Register Screen*


**Figure 4**

*Overview of the Application's File Upload and Search Screens*

**Figure 5**

*Overview of the Application's Audiobook Listen and Book Request Screens*


## Results and Discussion

Visually impaired individuals can directly see the literary works they want to access. Visually impaired individuals can access these problems with the help of various tools (Spotify, Audible, Audioteka, and AppleMusic) by paying certain subscription fees. The high subscription costs and low socio-economic level restrict visually impaired individuals from subscribing to various audiobook applications for specific prices.

In line with the problem mentioned above, a mobile application has been developed to enable visually impaired individuals to access literary works for free and offline within the scope of the study. With the developed application, individuals who have problems accessing paid audiobook platforms due to visual impairment or disability register in the system and request books from volunteer readers to be recorded. Volunteer readers sing the books according to their book requests and upload them to the system as audio files.

We believe our mobile application will pave the way for adopting information and communication technologies in social assistance.

## Directions for Future Research

In this section, suggestions for new research are given in line with the research results.

- The system's file player can be developed as a browser plug-in to make it easier to listen to audiobooks while navigating between platform web pages.
- Audiobooks on the platform can be shared on platforms such as Spotify and SoundCloud, so different audiences with busy schedules can benefit.

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