

Design Problem

Visual Impairments in Seniors

Global advancements in medicine and quality of life have resulted in increased life expectancy and, therefore, greater populations of aging and elderly individuals (Servat et al., 2011, p. 2). Concurrently, senior citizens—particularly those from marginalized and minority communities—are disproportionately affected by age-related vision loss, meaning cases of such impairments are increasingly affecting more individuals (Servat et al., 2011, p. 2). Visual impairments, such as macular degeneration, cataracts, and glaucoma, impose several difficulties (of varying degrees) on those who suffer from them. For example, individuals may experience double vision, heightened sensitivity to light, changes to their perception and periphery, and contrast sensitivity (Teutsch et al., 2016, p. 35), which is particularly important for the design proposed later in this document.

An individual's contrast sensitivity impacts their ability to discriminate and derive meaning from the different shades on an object, such as a face, sign, or text (Servat et al., 2011, p. 6; Teutsch et al., 2016, p. 35). For an elderly individual suffering from loss of vision, being unable to read text well exacerbates their existing lack of independence and can lead to a further decrease in their self-esteem (Servat et al., 2011, p. 3). Additionally, loss of the ability to read text places seniors in a difficult position, as it is in one's later years when life events such as familial deaths and increased health-related emergencies require them to interpret important documents (Servat et al., 2011, p. 3). This burden often extends to impaired individuals' family members.

Inadequate Library Resources

Elderly public library patrons form an underreported population for whom contrast-sensitivity visual impairments introduce a particular challenge, as they depend on this public institution for many text- and document-related needs, such as interpreting and completing government forms. Individuals from marginalized and minority communities (in conjunction with the added, disproportionate rate of visual impairment) often depend *completely* on public libraries as their “only access to information [or] the first point of contact...to other community agencies” (Servat et al., 2011, p. 2; Zalusky, 2020, p. 5). In other words, the need for senior-friendly, text-based visual accessibility aids in public libraries is extensive and immediate.

While one would imagine that a public library is readily able to provide the necessary visual assistance, underfunding and understaffing—particularly of outreach librarians with disability certification—leave many visually impaired elderly patrons without the prompt service they need. Digital services, such as the Library of Congress’ WebReads, allow legally blind patrons to order braille and CD-ROM materials, but this resource is heavily access-restricted and requires fulfillment time before patrons can receive their requested physical materials. Given the ubiquity of mobile devices, many software developers and (other) government institutions have attempted to exploit their portability by designing apps to provide visually impaired library patrons just-in-time visual access to digital, text-based materials. While apps such as BARD Mobile increase patrons’ access via screen-reader and text-to-speech capabilities, their access is also heavily restricted (National Library Service for the Blind and Print Disabled, 2024, Section 1.3), and they do not provide specific accommodations for *elderly* users.

Given the challenges and contexts above, there is an immediate need for a barrier-free, just-in-time mobile application that provides text accessibility to visually impaired elderly library patrons.

Design Opportunity

The problem above presents a unique opportunity to fill the current gap in the design and development of mobile apps for visual accessibility. While still honoring the sound and research-based principles of visual accessibility apps, the proposed, novel mobile app will be unique due to its defined—yet inclusive—scope and specifically designed features for that audience. Specifically, the app will provide targeted assistance for visually impaired individuals who are library patrons *and* elderly, effectively merging the audiences of the two digital resources mentioned above (i.e., WebReads and BARD Mobile). Furthermore, to promote inclusion, the present design will be made available without needing to register (although connection to an existing library card will be supported and encouraged), meaning users will have *immediate* access to assistive resources. Together, these particularities expand upon the foundation created by WebReads and BARD Mobile, filling that respective gap in current digital tools by catering to specific end users.

As their need for this service is immediate, its benefits are also clear. By targeting the intersection of the visually impaired, the elderly, and library patrons, members of this community will be able to engage with visual accessibility tools, library materials, and librarian-oriented assistance through a low-/no-vision, senior-friendly interface. This approach directly aligns with the burgeoning trend of developing senior-friendly mobile apps to meet their demand for assistive digital resources (Elguera Paez & Zapata Del Río, 2019, pp. 423, 435). Whereas these resources are popular for medical purposes (Elguera Paez & Zapata Del Río, 2019, p. 423), the

present design adds to the trend by focusing on accessibility. To accomplish this, the proposed app will combine media for multiple text needs; in other words, it will not simply be a screen reader, magnifier, or text-to-speech aid. Rather, it will encompass all areas where visually impaired, elderly library patrons may experience a need when engaging with text-based resources. The proposed app will assist with existing printed and published library materials *and* provide patrons with a way to utilize those same tools in real-life situations where text is encountered, such as interpreting medical or legal documents, reading personal mail, and navigating signage. Therefore, this app will extend the usefulness of library personnel and resources into patrons' everyday routines.

References

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