Designing cognitively accessible online banking to support older adults

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ABSTRACT

We present work in progress to probe the design of a cognitively accessible online banking tool to support people as they age. Building upon our published literature review on the cognitive accessibility of digital payments, we will conduct user-centered design with older adults with or without cognitive impairment to identify the user requirements of an accessible online banking prototype. Through a series of design workshops, followed by the development, deployment, and evaluation of the proposed integrated banking support, the prototype and design guidelines stemming from its design and evaluation process will help promote continued technology use in later life. We hope this work will enrich cognitively accessible design space and inspire future HCI work in broader accessibility settings.

Index Terms: Human-centered computing—Accessibility—Empirical studies in accessibility

1 MOTIVATIONS AND OBJECTIVES

Interactive technology could enable older adults, even those experiencing cognitive decline, to maintain autonomy and social participation. Although nine Canadians aged 65+ are diagnosed with dementia every hour [7], few everyday technologies accommodate the specific needs of age-related cognitive decline. A cognitively accessible design aims to ensure ease of learning and use by identifying cognitive challenges and removing barriers to processing information. Recent studies [3, 4] including our prior work [2] have established the often overlooked capabilities of people with cognitive impairment in technology use. Meanwhile, financial technology (fintech) has grown ubiquitous with increasing online services and declining cash use [5], necessitating removing barriers to participation in this fundamental aspect of society. A probe into online banking can elicit concrete user insights into accessibility features and privacy and security concerns (e.g., [6, 8]), better grounding technological approaches to cognitive accessibility.

This project aims to prioritize and contextualize cognitively accessible design into general-purpose applications, probing online banking as a concrete starting point. Our objectives are 1) identifying the user requirements of age-related cognitive accessibility in online banking and 2) advancing cognitive accessibility support for older adults by designing an integrated web-based banking tool.

2 METHODS

We adopt user-centered design methods centering around older adults with or without cognitive impairment.

Phase 0: Literature review   Our collaboration with the fintech team at the Bank of Canada characterizes the cognitive accessibility of digital payments through a literature review, nuancing the challenges of online banking for older adults and people with neurodiverse needs [1]. Our findings uncover potential design and support strategies, including simplifying interfaces with diversified cues,

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raising designer awareness and participant involvement, extending third-party support, and leveraging new technological aids. We propose design implications such as promoting agency in collaborative payments, contextualizing inclusive approaches, and expanding AI-powered accessible design. Building upon this published preliminary work, we plan to further consolidate the currently scattered design guidelines on cognitive accessibility.

Phase 1: Design workshop series   Phase 1 will characterize older adults' perspectives on cognitive accessibility features in online banking and broader contexts. We plan to conduct a series of design workshops involving 12–18 older adults with or without cognitive impairment to investigate user requirements and perceptions of online banking. We will run three workshop series, each consisting of four sessions over 4-6 weeks and including 4–6 participants to ensure everyone's active contributions. Each series will begin with a brainstorming session on current cognitive supports and barriers in mainstream applications. The following three sessions will involve deconstructing cognitive processes in online banking, paper-prototyping cognitively accessible features, and critiquing low-fidelity prototypes. We will audio-record all workshops and perform a thematic analysis to identify critical themes, which will be combined with the low-fidelity prototypes as the Phase 1 output.

Phase 2: Development, deployment, and evaluation   Phase 2 will produce a functioning web-based application, assess its cognitively accessible design qualitatively and quantitatively, and advance design guidelines for cognitive accessibility. Through an empirical evaluation involving a mix of new and previous workshop participants, we will evaluate the resulting high-fidelity prototype incorporating the banking features from the design workshop findings. After 2–3 weeks of deployment, we will analyze system log data usage through descriptive statistics. We will combine interviews with standard evaluation tools like SUS and NASA TLX to concretely establish the prototype's usefulness. Finally, we will consolidate all the qualitative and quantitative evaluation findings, as well as successes and setbacks throughout the research process, into new actionable guidelines and the final prototype to inform future cognitively accessible design.

3 IMPLEMENTATION AND SIGNIFICANCE

We plan to make the final prototype open source, available to academic, professional, and public audiences, as well as offering open access to our publications. By addressing the urgent and widespread need of users with age-related cognitive decline, this work can strategically operationalize cognitive accessibility through new system design guidelines. The proposed online banking application, along with its design and evaluation process, will help establish practical design strategies to better aid continued technology use in later life beyond fintech settings. This project will expand the scope of cognitively accessible design and advance cognitively inclusive research and practice.

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