D4HA: Designing for Healthy Aging

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Abstract—As the population ages, more older adults are becoming technology users. However, many older adults experience declines in one or more abilities during the process of aging, including a reduction in ranges and levels of abilities, such as vision, cognition, and dexterity, that can limit their ability to interact with technology interfaces. As a result, an aging population of technology users experiences a number if varying issues with technology and environment. Despite these problems, environment, product, and user interface (UI) design can help older adults by incorporating their particular sensory-perception, motor, communication, and mental needs into the design of the technologies. A special session on Designing for Healthy Aging is included in the Tenth International Conference on Advances in Computer-Human Interactions (ACHI 2017), held in Nice, France. Two papers address the varying challenges faced by an aging population and describe strategies, guidelines, and methodologies that are needed for successful and healthy aging.

Keywords-Design for aging; design and evaluation; methodologies; design strategies.

I. INTRODUCTION

As the population ages, more older adults are becoming technology users [1]. However, many older adults experience declines in one or more abilities during the process of aging, including a reduction in ranges and levels of abilities, such as vision, cognition, and dexterity, that can limit their ability to interact with technology interfaces. As a result, older adults may not understand common icons, take a long time to complete a task or have poor task performance, make a number of errors, have difficulty in seeing text, and have problems understanding the relationship between the touch screen and button manipulation with the response of the interface [2]-[4]. Despite these issues, environment, product, and user interface (UI) design can help older adults by incorporating their particular sensory-perception, motor, communication, and mental needs into the design of future technologies [5].

II. DESIGN STRATEGIES, METHODOLOGIES, AND APPROACHES FOR OLDER ADULTS

The presence of vision, hearing, cognitive, dexterity, and motor skill impairments in older adults limits their use of technology [1]. Importance, benefit, and potential of technology depend on its usability, effectiveness, and ease of use [1][6]. Therefore, usability and effectiveness of technology are of crucial importance for older adults.

A number of design strategies, approaches, and methodologies have been developed to address usability issues and effectiveness of environments, products. Design approaches targeted towards specific abilities and limitations are not effective in the case of multiple limitations or diversity of limitations in older adults. Alternatively, Universal Design (UD) [7] advocates for the design of spaces, buildings, products, graphics, and interfaces usable by all people, to the greatest extent possible. Similarly, Universal Usability (UU) [8] is a strategy that supports usability, inclusivity, and utility of information and communication technology. Design for Aging [1] is a strategy that explores the factors that constrain the use of products and user interfaces by older adults, as well as aspects of human-computer interface design that accommodate older users with age-associated disabilities and limitations. It offers practical guidance to design of technologies for older adults. Design Thinking is a methodology that integrates design strategies into the design process [9]. It emphasizes that the process of design is a collaborative effort, which needs to be explored in hands-on activities with stakeholders. User-centered design (UCD) involves design processes in which end-users influence how a design takes shape [10]. It proved very effective in developing useful and usable everyday objects and technologies for older adults. Understanding the end-users, analyzing their tasks, setting measurable goals, and involving them from the beginning of the design process are some of the main methods of this approach.

In addition, new methodologies, strategies, guidelines, and approaches are necessary and needed to address the numerous challenges faced by an aging population, which are needed for successful and healthy aging.

III. SPECIAL SESSION: DESIGNING FOR HEALTHY AGING, D4HA

In a special session on Designing for Healthy Aging, D4HA, held as part of the Tenth International Conference on Advances in Computer-Human Interactions (ACHI 2017) conference in Nice, France [11], two papers are presented that discuss the varying challenges faced by an aging population and describe the design strategies, guidelines, and methodologies that are needed for successful and healthy aging. Ruzic, Harrington, and Sanford [12] adapted and integrated four commonly used design strategies to create an inclusive and comprehensive set of guidelines for interactive mobile interfaces for an aging population. In the research paper, they presented an overview of the Universal Design Mobile Interface Guidelines (UDMIG) for an aging population and the evaluation checklist. The design guidelines and related evaluation checklist were created to help with the design of future mobile technologies and to ensure their usability by older adults through universal design that accommodates all users to the greatest extent possible. Their research contributes to the field of computer-human interactions by including an aging population of users and advancing the technology uses for the mobile touchscreen interfaces for this population. Rebola and Hermann [13] explain the result of interconnecting the Design Thinking, a methodology used commonly by designers to solve complex problems and find solutions towards creating a preferred future, with the Design for Aging, a strategy that requires focused expertise, guidelines, and principles for generating effective solutions for the aging population. They introduced a system for design thinking for older adults, comprised of a seven-phase "P" methodology: Position, Purpose, Prosthetics, Place, Participation, Potential, and Presentation. The paper presented a case study on the application of the designing thinking "P" process for a project "Aging and Health(care) 3.0: Place of Aging," collaboration across Industrial Design and Architecture. The authors introduced an approach to identify the critical opportunities when designing for healthy aging.

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