Project Report: Enhancing Elderly Care Through Telepresence Robots

Group Name/Number: Enhancing Elderly Care Through Telepresence Robots

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Introduction and Terms of Reference
This project focuses on exploring the applications and potential benefits of telepresence robots (TPRs) in elderly care. It seeks to understand how these technological solutions can provide inclusive services for elderly individuals beyond their physical limitations and assess their receptiveness towards this technology. The primary goal was to conduct a multifaceted study through literature review and user interviews to assess the feasibility and acceptability of TPRs in enhancing the quality of life for the elderly.

What was the problem being solved?
The central issue being addressed pertains to the exploration and enhancement of understanding regarding the potential roles that TPRs can play in transcending the physical limitations typically encountered by the elderly. This inquiry is particularly focused on the feasibility and efficacy of using TPRs to deliver inclusive services to this demographic, aiming to substantially improve their access to various social and healthcare services that might otherwise be inaccessible due to mobility restrictions or geographic isolation.

The study seeks to assess the attitudes of elderly individuals towards the adoption and interaction with TPRs. This includes examining both psychological and practical receptivity, potential barriers to acceptance, and the overall willingness of elderly users to integrate such technology into their daily lives. By analysing these facets, the research aims to identify key factors that influence the deployment and effectiveness of telepresence robots in supporting elderly individuals, thereby facilitating a more nuanced understanding of how such technological interventions can be optimised to enhance the quality of life for the aging population.

Importance of the Study
The growing need for remote access to a range of services, which has been sparked by both societal changes and technical improvements, highlights the importance of this topic. The aging global population presents unique challenges, particularly in providing

accessible care and companionship. Elderly populations, who commonly face obstacles to service access because of mobility constraints or geographic isolation, have a particularly pressing need for this. TPRs hold the promise of bridging the gap between the elderly and the continuous care they require, without the constraints of geographical and physical boundaries. Investigating this technology's potential utility and societal acceptance is critical as it represents a forward-looking solution to a pressing demographic issue.

Although TPR integration is a possible solution to these issues, a number of barriers, including a lack of acceptance of its application and effectiveness in work environments, are keeping it from being widely adopted. This mistrust stems in part from the novelty of integrating TPRs into society functions - a technological frontier that many people are still finding difficult to comprehend and embrace. Because of this, the effective use of TPRs depends not only on proving their usefulness but also on raising public acceptance and confidence in these kinds of technologies.

Addressing this topic is of paramount importance not only because of the immediate benefits that TPRs can offer in terms of care and accessibility for the elderly but also due to the broader implications for future applications across various sectors. Elder care, given its critical need for innovative solutions to improve quality of life and care delivery, may serve as a pioneering field for the widespread adoption of robotic services.

Thus, by investigating the technological, ethical, and social aspects of TPR implementation in elder care, this study aims to delve into the complexities of the field. This field can lead to greater public acceptability and the integration of robotics in service delivery by comprehending and eliminating the perceived barriers and boosting the perceived benefits. This will result in more inclusive and accessible care solutions for all demographics.

Project Objectives and Expected Outcomes

The project aimed to:

- Assess the current landscape of TPR usage in elderly care through systematic literature reviews.
- Gather direct feedback from the elderly on their perceptions and openness to using TPRs.
- Spread awareness and disseminate findings through innovative social media outreach.

Expected outcomes included:

- A detailed report encapsulating the analysis of current research, user perceptions, and potential applications of TPRs.
- Increased public awareness and engagement through targeted social media content.

Applied Activities

To develop an understanding of how TPRs can be effectively integrated into elderly care and to explore the attitudes of elderly individuals towards this technology, we adopted the following approach:

1) **Analysis of previous studies.** This involves an analysis of existing research within the realm of gerontology, utilising authoritative academic databases such as Scopus and Web of Science. The goal was to synthesise the breadth of scholarly discourse, identify gaps in the current research landscape, and determine the direction of future inquiries.
2) **Assessing needs.** This activity entailed conducting structured interviews with older adults to gather first hand insights into their experiences, preferences, and requirements. By directly engaging with this demographic, researchers can obtain nuanced understandings that might not be evident from secondary data alone. This qualitative approach allowed for the adjustment of research parameters to better align with the actual needs and challenges faced by the elderly.
3) **Documentation.** Effective documentation encompasses the thorough recording of findings, insights, and subsequent recommendations. This is essential not only for maintaining a transparent and replicable research process but also for enhancing the visibility and accessibility of the information gathered.
4) **Communication.** Developing and maintaining efficient communication channels is crucial for the success of any research endeavour. This includes creating platforms for continuous dialogue among researchers, participants, policymakers, and other relevant stakeholders. The objective is to ensure that all parties are informed and able to contribute to the discussion, thereby enriching the research outcomes and fostering collaborative solutions.
5) **Contribution to the knowledge base**. The research aimed to contribute significantly to the existing body of knowledge in gerontology and elderly care. By introducing innovative methodologies, uncovering new insights, and advancing theoretical and practical aspects of elderly care, the research aimed to push the boundaries of what is currently known and practiced in the field.
6) **Spreading awareness.** The dissemination of research findings and the promotion of awareness are critical to effecting change in the field of elderly care. Utilising modern digital platforms such as TikTok, researchers can create engaging, informative short videos designed to reach a broader audience, including the general public and younger generations. This approach helps in demystifying complex research outcomes, making them accessible and actionable to all societal segments.

We systematically reviewed scholarly articles to assess the current state of research on TPRs in elderly care. Utilising prominent academic databases such as Scopus and Web of Science, our team analysed 90 peer-reviewed articles. The selection and review of these articles were structured around the PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses*) guidelines, which provided a rigorous framework for data collection, ensuring both the relevance and quality of the

information aggregated. This step was crucial for understanding the breadth and depth of existing research, identifying gaps in the literature, and setting the foundation for empirical investigation.

To capture in-depth qualitative data, we conducted structured interviews with eight elderly participants from diverse cultural backgrounds, specifically from Estonia, Finland, and India. These interviews were designed to elicit rich, descriptive insights into the personal perceptions and attitudes of elderly individuals towards TPRs. Key themes explored included perceived benefits, potential fears, and overall expectations of integrating such technology into their daily lives. The interview data were analysed using thematic analysis, allowing for the identification of common patterns and unique perspectives across different cultural contexts.
On the basis of the systematic literature review and the insights gathered from stakeholder interviews, a manuscript was prepared for submission to a peer-reviewed journal, aiming to contribute to the academic discourse on the integration of TPRs in elderly care.

Social Media Engagement
The TikTok account (https://www.tiktok.com/@tlu.social.work?_t=8lz3ukQl7o0&_r=1). was established with the objective of enhancing public awareness about the integration of TPRs in elderly care through the medium of social media. The account features a series of educational and engaging content specifically tailored to disseminate knowledge about the benefits of such technology.

Content on the account includes:

- Five short video clips that detail the advantages of using TPRs in elderly care settings. These videos highlight the various functionalities and benefits, such as improved communication, increased emotional support, and enhanced monitoring capabilities.
- Two clips that provide real-life examples from the Uhtna care home in Estonia, showcasing the successful implementation of a robot-cat. These videos illustrate the positive impact that such robots have on the residents, including emotional comfort and companionship.
- One student report video that summarises the findings and experiences of the current project. This clip provides insights into the research methodology, key results, and the practical implications of the study.

As of May 11th, the content had garnered a total of 4,761 views, indicating a growing interest and engagement from the audience. This platform serves not only as a tool for education and awareness but also as a testament to the practical application and benefits of innovative technology in enhancing the quality of life for the elderly.

Analysis and Findings

The thematic analysis of the literature and interview data provided a multidimensional perspective on the integration of TPRs into elderly care. The findings suggest that TPRs can significantly enhance elderly well-being by:

- Promoting social connections and reducing feelings of loneliness.
- Providing consistent companionship and emotional support.
- Facilitating daily routines and improving communication with family members.
- Offering potential cost savings in healthcare management.

Sustainability and Future Implications

The project outcomes are curated to ensure sustainability through ongoing academic contributions and public engagements. Ownership of the project results resides with the university and the participating stakeholders, ensuring that the findings and recommendations continue to influence future policies and technological developments in elderly care.

Conclusion

The project successfully met its objectives by providing a deep understanding of the potential roles of TPRs in elderly care, supported by empirical data and extensive literature review. The positive reception of the technology among the elderly and the wider community highlights the feasibility of further integrating TPRs in care systems. Ongoing research and adaptation to user feedback are essential for the continued success and acceptance of this innovative solution.