Name of Case Study: Wearable Assistive Technology for dementia residents in institutional care

Case Description: The number of people with dementia is increasing worldwide, while the resources of family and professional caregivers are limited. In nursing homes and other institutional care facilities, people with dementia often face challenges due to unfamiliar environments, resulting in disorientation and confusion. This results in a high burden for patients and caregivers and increased demands on caregiving time. Assistive technology offers an approach to relieve caregivers' burdens and assist people with dementia. To be useful and accepted, such technologies should respect the values and needs of the relevant stakeholders. The task is to apply the value-sensitive design approach to identify the values and needs of stakeholders regarding wearable assistive technologies for people with dementia in institutionalized care.

 Value Sensitive Design Discussion Questions

1. Who/what are the direct and indirect stakeholders of this product? Brainstorm as many as possible.
    a. A stakeholder of a product is an entity that can either affect or be affected by the product.
    b. Direct stakeholders: Users (who directly interact with the product).
    c. Indirect stakeholders: Non-users who have a stake in the product.

2. What are the values and needs of these stakeholders? Brainstorm as many as possible.
    a. Values are what are considered important or beneficial by individuals or groups.
    b. Certain values can be abstract and need to be translated into more concrete and specific needs in a context.

3. Are there any conflicting values or needs among the stakeholders? How can these conflicts be addressed?

4. What initial design concepts can you develop, taking into consideration the identified stakeholders and their values?

5. What are some potential scenarios for the design's use, and how well does the design align with different stakeholder's values and needs in these situations?

Design Task:

Design a wearable technology, such as a smart watch, for dementia residents in institutional care facilities (e.g., nursing homes). Consider the following sample use cases or scenarios (pp. 9-11), and feel free to generate additional use cases:

1. Sleep disturbances at night: A resident wakes up in the middle of the night disoriented and unsure whether to continue sleeping or go to the bathroom, depending on their daily routine. Going to the bathroom may require the nightlight to be turned on, some navigation guidance, and notification of caregivers.

2. Wandering behavior: A resident leaves their living area to attend a group activity but forgets their destination and starts wandering.

3. Impair planning: A resident intends to go to the bathroom in the morning but mistakenly opens the exit door instead of the bathroom door, or they may go to the bathroom but forget to flush the toilet or wash their hands.

4. Medication: A resident needs to take medication at specific times throughout the day but sometimes forgets or gets confused about the dosage.

5. Emergency assistance: A resident experiences a sudden medical emergency, such as chest pain or a fall, and is unable to call for help.

Not all the problems and needs mentioned in these use cases need to be addressed by the smartwatch design. When developing initial design concepts, you can choose to identify the problems and issues that you believe can be effectively solved by the design and focus on those instead.

Additional Comment:

Please avoid perceiving dementia patients as individuals without agency or personal preferences. It is important to research and understand what they, as well as other stakeholders, value and care about.

References:

What it is like to live with dementia:
- [What to expect as the person's dementia progresses | Alzheimer Society of Canada](#)
- [Alzheimer's Stages - Early, Middle, Late Dementia Symptoms | alz.org](#)
- [Living with dementia](#)

Existing wearable devices for seniors:
- [9 Wearable Devices for Seniors to Improve Health and Safety](#)

Older adult's experience with wearable technology:
- Brickwood, K. J., Williams, A. D., Watson, G., & O'Brien, J. (2020). [Older adults' experiences of using a wearable activity tracker with health professional feedback over a 12-month randomised controlled trial](#)
- Garcia Reyes, E. P., Kelly, R., Buchanan, G., & Waycott, J. (2023).[Understanding Older Adults' Experiences With Technologies for Health Self-management: Interview Study - PMC](#)

Developers' perspectives and ethical concerns:
- Howes, J., Denier, Y., Vandemeulebroucke, T., & Gastmans, C. (2024). [The Ethics of Electronic Tracking Devices in Dementia Care: An Interview Study with Developers | Science and Engineering Ethics](#)

Informal carers' perspectives:
- Sriram, V., Jenkinson, C., & Peters, M. (2020). [Carers' experience of using assistive technology for dementia care at home: a qualitative study | BMJ Open](#)

Additional academic resources:
- Köhler, S., Görß, D., Kowe, A., & Teipel, S. J. (2022). [Matching values to technology: a value sensitive design approach to identify values and use cases of an assistive system for people with dementia in institutional care](#)
- Wangmo, T., Lipps, M., Kressig, R. W., & Ienca, M. (2019). [Ethical concerns with the use of intelligent assistive technology: findings from a qualitative study with professional stakeholders](#)
- Mahoney, E. L., & Mahoney, D. F. (2010). [Acceptance of Wearable Technology by People With Alzheimer's Disease: Issues and Accommodations - PMC](#)