

Designing an integrated dashboard for the comprehensive measurement of well-being in people with dementia: A multidimensional approach

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Purpose The rising ageing population affected by dementia urges for a comprehensive monitoring approach to improve care quality and mitigate caregivers' burden. Literature reports that traditional monitoring methods may fail in capturing the overall aspects of well-being in individuals with dementia (PwD) (Jackson, 2020). Using heterogeneous sensor networks for continuous measurement, objective data collection across physiological, behavioral, and environmental parameters may provide a solution. A holistic dashboard that aggregates and analyzes this data can provide actionable insights, facilitating timely care adjustments and optimizing resource allocation (James et al., 2022; Moore et al., 2020). This approach enhances care quality, improves PwD's quality of life, and significantly reduces caregiver burden by prioritizing their focus on personal and emotional support. Therefore, the purpose of the HAAL project is to aggregate innovative products from previous initiatives into a holistic dashboard tailored for PwD. The HAAL dashboard aims to enter the AAL industry and foster a learning community across Italy, the Netherlands, and Taiwan, demonstrating that integrating multiple devices can enrich the platform's value (Morresi et al., 2022). **Method** A wellbeing dashboard has been developed with embedded algorithms to evaluate the overall wellbeing of patients, incorporating data from the HAAL sensor network. The algorithms that monitor various aspects of PwD wellbeing analyze and measure deviations from typical patterns over a period of two weeks, using filtered data to enhance outcome quality. The result of these algorithms are color-coded indicators for assessing wellbeing quantitatively and detailed charts for trend visualization, facilitating quick caregiver assessments. It displays well-being indicators related to general wellbeing (combining sleep, toileting, and eating patterns), sleep activity (from the Whizpad smart mattress), cognitive status (from cognitive game scores), and physical status (recorded by Sensara), all varying in size and color based on device data. **Results and Discussion.** As preliminary results, considering a monitoring period of 36 days, the physical wellbeing of one PwD was monitored, in the framework of the pilot testing. The dashboard's results from the monitored period show that for the physical wellbeing, 38% were rated as BAD, 35% as GOOD, and 18% as NEUTRAL, while the remaining 9% represent days when data collection was interrupted due to sensor malfunctions. This result provides valuable insights to help the caregiver in monitoring daily the PwD, deciding the type of treatments, but also decide whether to promptly intervene or not.

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Keywords: wellbeing, sensor network, behaviour monitoring

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Acknowledgement: The authors gratefully acknowledge support from the European Commission's Active and Assisted Living (AAL) programme, co-financed by the consortium national funding agencies. The authors also thank the HAAL "Healthy Ageing eco-system for people with dementia" (AAL-2020-7-229-CP) partners for their support.

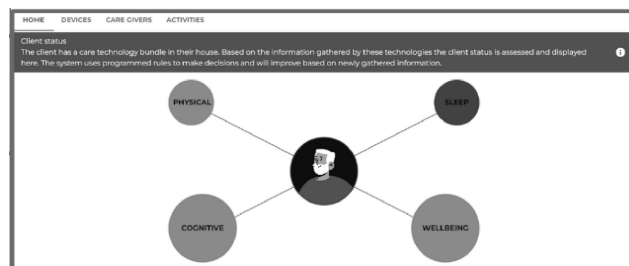


Figure 1. Screenshot of the homepage of the HAAL dashboard for a patient