

Acceptance and B2C Market Potential of Smart Home-Based AAL Solutions for Elderly Care from an Energy Provider's Perspective

Themenbereich: Aktive Endkunden-/Prosumerpartizipation & Gebäudesektor

Lisa POMMERENING¹ (1), Nina HAMPL² (1)

(1) Wirtschaftsuniversität Wien

Motivation and Research Questions

The constantly growing aging population [1][4] and the rising frequency of chronic diseases [6] indicate an increasing need for healthcare services soon [2][3]. Since a lack of personnel in the healthcare sector already exists [3][5], other solutions such as smart home-based Ambient Assisted Living (AAL) technologies for elderly care purposes are promising. However, AAL has been scarcely adopted so far [2]. Thus, the aim of this study is to assess the acceptance and B2C market potential of selected smart home-based AAL solutions for elderly care purposes from an energy provider's perspective (e.g., daily activity monitoring via smart meters).

Methods and Data

In May 2022, a web-based survey among people above 59 in the Greater Vienna area was conducted (n=316). Participants were asked to fill in socio-demographic and socio-psychological information such as age, gender, education, experience with AAL technologies, whether the person provides or receives long-term care etc. Several questions using a 5-point Likert scale had to be answered (1= Agree, 5=Disagree), with which seven latent variables such as intention to use AAL ($\alpha = 0.894$) were built. Ultimately, participants were asked to complete a choice-based conjoint (CBC) experiment, where they could choose between three options and one none-option. For that, six attributes, such as product, monthly service fee, provider, data sharing etc., were used.

Product	3 fall detection sensors for 3 rooms	Activity detection using smart meter	3 fall detection sensors for 3 rooms in combination with a sensor for environmental monitoring
Monthly service fee	20€	10€	40€
Purchase price	200€	300€	0€
Provider	Public energy supplier	Private technology company	Public care organization
Data sharing	With nobody	With nursing staff	With person(s) of your choice
Data storage	1 week	1 year	None
I would <u>not</u> choose any of these options.			

Figure 1: Example of a CBC task

¹ Jungautorin: Adresse: Wirtschaftsuniversität Wien, Welthandelsplatz 1, 1020 Wien, Tel.: +43 699 15099231, Email: lisa.pommerening@s.wu.ac.at

² Adresse: Wirtschaftsuniversität Wien, Welthandelsplatz 1, 1020 Wien, Tel.: +43 1 31336 4864, Email: nina.hampl@wu.ac.at

In the statistical analysis, a multiple linear regression was performed using intention to use AAL as a dependent variable. The conjoint experiment was analyzed using Hierarchical Bayes estimation to find out the relative importance scores of the attributes as well as to generate the part-worth utilities of the attribute levels. Further, the respondents' indirect willingness to pay was determined based on the part-worth utilities. Lastly, latent class analysis was performed to cluster the overall, very heterogeneous sample into smaller, more homogeneous sub-groups.

Results and Conclusion

The findings of the survey highlight the rather low acceptance level (mean=2.89, none-option was chosen in 55.8% of the CBC tasks) of smart home-based technologies for elderly care, although the overall perception (mean=3.65) was very positive. The results further suggest that fall detection sensors enjoyed a higher acceptance among the participants compared to activity detection using a smart meter, which was also evident in the respondents' four times higher willingness-to-pay for the former (when combined with an environmental monitoring sensor). The most important attributes were found to be purchase price (22.59%), monthly service fee (21.93%), and product (17.66%). The likelihood of adoption was explained through the opinion on AAL technologies of people of importance ($p < .001$), the perception of oneself as a user of technologies for well-being and health ($p < .001$), the confidence in learning to use AAL ($p = .001$), as well as the general attitude toward these technologies ($p < .001$). Lastly, three segments were identified that share similar preferences:

- *Non-adopters* (41.1%),
- *Price-sensitive adopters* (29%),
- *Early adopters* (29.9%).

Overall, the findings of this study serve as a foundation for (potential new) providers in this market. It further aids marketers at identifying and targeting customer segments based on their preferences.

Literature

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