

High Tech, High Touch: Integrating Digital and Human AAL Advisory Services for Older Adults

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Abstract: While Ambient Assisted Living (AAL) solutions have conquered some market niches of service provisions to the ageing society, those services are often still provided in isolation and in a technocentric way. In this position paper, we build on the concepts of engagement ecosystems and engagement platforms to argue that an integration of physical and virtual worlds is necessary for service provisions in the AAL field in general and in advisory services in particular. We discuss the challenge on how to integrate virtual and physical dimensions in a solution for stakeholders' engagement. With a focus on the 'human touch', we conceptualize Active Advisors, embedded in the scope of the EU-funded project ActiveAdvice. We state that the concept of a human advisor is of utmost relevance in this field due to the digital divide still affecting older age groups. Active Advisors help to overcome the shortage of most service and product platforms, i.e. lack of personalization and interaction, and at the same time offer a face-to-face (f2f) experience in the consumer-organization interactions.

1 INTRODUCTION

The fast advances in the field of Information and Communication Technologies (ICT) have been impelling changes in the interactions among individuals and their environments. From a consumer-company/organization interaction point of view, the various touch points have evolved over time and new technologies have been acting as great enablers of service innovation (Breibach and Maglio, 2015). ICT allows consumers to expect and receive more service, information and support than ever before. The experience of new platform technologies is significantly increasing consumers' expectations and, at the same time, promoting consumers' empowerment. We are living in a new age of consumer engagement, which can be defined as the individual psychological state resulting from the interactions between a focal engagement subject – the

consumer – and an object – the organization (Brodie et al., 2011). Consumers also have demonstrated willingness to become more active and engaged in the value creation themselves. Consequently, there is a demand for a transformation of this value creation in the society in general, and in the organizations providing product and/or services in particular. An important market of service provision for the contemporary ageing society has been opened for Ambient Assisted Living (AAL) solutions, targeting active and healthy ageing in the older adults' preferred environment. It was previously noticed, however, that services within this market have been provided in isolation and often in a technocentric way (Baldissera and Camarinha-Matos, 2016). Among others, these factors are likely to contribute to the current gap between technology development and its uptake by end users.

In this landscape, we start by pointing out that organizations providing services in the AAL field must predominantly act as enablers of engagement platforms. Only in such capacities can they leverage individuals' and groups' drive to create value for, but mostly with them. For the implementation of these engagement platforms, the technological developments in the last 20 years have been instrumental by allowing interactions among stakeholders in virtual environments (Breidbach, et al., 2014). However, nowadays we have rather complex service logics to consider, as in most service sectors the consumer journey is growing in complexity (Peters et al., 2015). Currently, there are also trends showing a certain shifting 'back' to the physical, face-to-face (f2f) interaction, which oppose the very dominant perception of existence of purely virtual service landscapes, even with emerging good examples (e.g. Google, Microsoft business cases) (Breidbach et al., 2014). However, a real, seamless merger of both physical and virtual worlds in the service user journey may still be some way off. Nevertheless, we build on Breidbach et al. (2014) definition of engagement ecosystems, which considers both physical and virtual focal actor touch points, to argue that an integration of real/physical and virtual worlds is necessary for service provision in the AAL field. The challenge here, too, is how to integrate both virtual and physical dimensions in an optimal solution for stakeholders' engagement. Although of relevance for all kind of consumers throughout a variety of different services, the mentioned integration seems to assume particular relevance when older adults are the target audience. The digital divide still affects this population group and a preference for f2f contact, usually perceived as more trustworthy, continues to be shown by this age-group (Teles et al., 2017). Still, even though often treated as a homogeneous group, older adults are heterogeneous with diverse needs and life contexts raising the need for services that can be personalised.

In observing the ongoing present debates, two key points of concern emerge: trust, and personalization in service provision. We argue that the integration of the two interaction interfaces (physical and virtual), and of the mechanisms that allow the collaboration between multiple stakeholders facilitate the trust building and the degree as well as format of personalization in service provision in the AAL field.

This paper discusses the challenges of integrating the different interaction interfaces with respect to the advisory in the AAL field and takes into consideration a multi-stakeholder perspective. This is done by building on the experience and reflexions

emerged in the scope of the EU-funded ActiveAdvice project, which intends to set up a pan-European advisory and decision-support platform that brings together the broad range of available AAL products, services and stakeholders. We take into consideration a shift from a purely online interaction to an integrated logic, in the scope of advisory services targeted at stakeholders in the AAL ecosystem, towards the promotion of services and products which are, at best, context and situation-aware, pro-active, and adaptive. In line with this, we will discuss the concept of human advisors, so-called 'Active Advisors', an idea born within the ActiveAdvice project and reinforced by the insights from user-centred requirement interviews conducted with multiple stakeholders (ibid.). These advisors facilitate the integration of the previously stressed different interaction interfaces. We argue that, both, human and digital advisory for older adults on AAL solutions need to be integrated, as a mean to jointly improve the user experience (e.g. in terms of trust and personalization) and promote user empowerment.

Additionally, we reflect on what different kinds of advice older adults need regarding AAL products and services. By doing so, we seek to evaluate how advice is going to be best provided, keeping in mind that we discuss a field that is highly sensible to external interference and is by definition individualized, as we all consider ourselves being and living in unique situations with very specific needs. We keep in mind what has been said for other fields. So, e.g. for the finance and investment domain, Roy (2016) posted: "I believe digital tools can enhance the advisor-investor relationship, not end it". The author summarizes that technology is not going to replace the human advice, it will complement it. The next chapters will discuss the concept as well as the framework of engagement ecosystems and engagement platforms. We attempt to answer the questions of how an engagement ecosystem for AAL can integrate digital and human advice, what features need to be guaranteed when providing a service with both digital and human advice to older adults, as well as to formal/informal caregivers, governmental bodies, local authorities and other relevant stakeholders of the AAL ecosystem.

2 ENGAGEMENT PLATFORMS INTEGRATING VIRTUAL AND REAL ENVIRONMENTS

Ramaswamy and Gouillart (2010) framed engagement platforms in the virtual sphere as purpose-built ICT-enabled environments. Breidbach et al. (2014) proposed an expansion of Ramaswamy's definition for engagement platforms by describing: "physical or virtual focal actor touch points, which are designed to provide structural support for resource integration, and that intend to ensure co-creation in relation to a focal actor or object, in order to enhance an actors' [sic] ability to experience engagement with such focal object" (p. 7). As exemplified by Blasco-Arcas (2015), engagement platforms can have a social focus namely in online brand communities such as Harley-Davidson; or a socially driven approach to transactions as illustrated by Amazon's and Nike's social commerce platforms. The logical question to ask, then, is: What features must a platform have to be qualified as an engagement platform? Ramaswamy and Gouillart (2010) characterize engagement platforms through transparency (visible interactions for a wider audience), access (user opportunity to integrate resources), dialogue (exchange of information) and reflexivity (platform's adaptability to changes). Other definitions tend to share this view. Yet, there is another question to be raised: If at all, to what extent are the current service platforms in the AAL field acting as engagement platforms? To kick-start the discussion on this question, we carried out a search for and analysis of websites/ portals/platforms that promote assistive technologies and services for older adults. In total, we analysed 42 articles along the topics of (i) studies on AAL user information; (ii) platforms (discussed & evaluated in research/studies); (iii) user feedback and social features; (iv) digital support algorithms; and (v) authorization process (Kofler et al., 2016). In addition, a sample of 12 service platforms¹ were selected to be analysed in detail regarding stakeholder involvement, interaction and feedback features. We also looked into whether advice was provided to customers and if so, how it was conducted (e.g. personalization). We present key points on interaction and personalization for compelling engagement experiences.

The articles analysed illustrated that the establishment of platforms in the context of technology promotion for older adults is not a priority. Less than one third dealt explicitly with the development and establishment of platforms and online information portals. None explicitly discussed a meta-AAL platform, which would be integrating services, products, and different stakeholders, nor is there anything like an EU-wide AAL marketing platform. These are, indeed, some of the gaps the ActiveAdvice project aims to bridge. However, among those platforms under review, the promotion of ICT and/or home care products and services and the sharing of information could be observed. The key observation clearly is that most of the platforms target older adults and their relatives, and thereby attempt to simple link manufacturers with potential consumer. A multi-stakeholder perspective is generally missing. This is especially relevant in the context of AAL, as such an approach, leading to more collaboration and coordination among stakeholders, could help addressing the current challenges on solutions uptake by its primary end users (Teles et al., 2017).

Secondly, among the twelve platforms, only eight guarantee immediate or direct feedback. They offer neither personalised feedback and/or advice nor interaction in the manner of e.g. a user forum. Thus, it seems that the main features characterizing engagement platforms are missing in many service platforms targeting ICT and ageing well. With respect to the building up of an engagement platform, we argue that interactivity and stakeholder involvement are the key elements to focus on. Guaranteeing interactivity has, however, been proven to be challenging, especially when developing a platform that supports sharing of information, knowhow and products, as well as building up networks of different stakeholders. Yet, as previously demonstrated, more and more people prefer to actively contribute rather than to only consume information from others in the online environment (Blasco-Arcas et al., 2016). This was, indeed, one of the insights emerging from the requirement interviews carried out within the ActiveAdvice project, where consumers expressed interest in becoming more active users as well as commenters in online environments. The conclusions presented here are based on 38 interviews carried out across European Union member states with 12 consumers, 14 businesses and 12 government representatives (Teles et al., 2017). The more interactive platforms are, the more likely their users

¹ Of the twelve service platforms under review, three were from the USA, two from the UK, three from France (one including

Belgium), one from Australia, one from Canada and two had a European scope.

become providers of content “in the form of evaluations, recommendations, opinions, instructions, facts and experiences“ (Sheng and Zolfagharian, 2014, p. 467). This kind of engagement has also been proven to foster empowerment, as consumers become aware of their roles and influences (Blasco-Arcas et al., 2016). Thus, the psychological attachment to an online community can be, indeed, a strong driving force. Within a community, it is easier to ask for information, seek advice or obtain feedback (Kofler et al., 2016). From the consumer perspective, these interactions are particularly relevant for empowering them through learning from other consumers’ experiences and choices. Consumer-to-consumer (C2C) interaction facilitates the decision-making process, as it can help diminishing the overload of information and the effort needed to filter it, therefore reducing uncertainty and complexity (Miceli et al., 2007). It seems that advice in form of contributions and reports by peers is a mean to generally increase trust in online advice. Hence, in this landscape, older adults and informal caregivers themselves have the opportunity to become ‘advisors’ on AAL solutions through experience sharing, thus upgrading their participation as content consumers to content generators. From the user studies conducted for the ActiveAdvice project, we concluded that a common expectation from consumers is obtaining feedback about AAL solutions, preferably by other end users, offering personal experiences with products, services and the platform presenting the solutions. Information on the person giving feedback is also an important aspect, for evaluating reliability, usefulness or trustworthiness (Teles et al., 2017).

In our view, within the scope of an ICT-enabled environment, a platform must also provide multi-stakeholders’ interaction, including mechanisms for consumer-to-organization (C2O) and C2C interaction. These provide stakeholders with the opportunity to participate, to create content and to connect, minimizing the drawbacks from lack of physical engagement and generating more “compelling engagement experiences” (Ramaswamy, 2009, p. 11; Montgomery and Smith, 2009). Interaction among stakeholders, thus, is key to reduce the risk perceived in decision making and, in general terms, to foster trust in an online environment.

In summary, the platform analysis has shown that personalised feedback and advice is not yet common. We previously concluded that personalization is a key requirement (Teles et al., 2017), and we can conclude that it’s central for building up an engagement platform. It enables, first, the consumer recognition of her particular needs (Füller and Matzler, 2007);

and, if the online platform manages to provide personalization mechanisms, it both facilitates the decision-making process and allows consumers to tailor-make the offer to their needs. We therefore also need to emphasize ‘democratization’ in the value creation as a key principle. Finally, multi-stakeholder platforms facilitate the interaction, the transfer and the empowering of actors.

3 USERS IN NEED FOR SUPPORT: CHALLENGES OF VIRTUAL AND REAL-LIFE INTERACTION

As online platforms annul the typical f2f interaction, the user’s acceptance has to be a priority concern of developers and promoters. Second, what is possible from a technological point of view and what is assumed from the developer side must not necessarily meet the individual user’s needs. Third, “(F)or a service to be successful it must be provided under consideration of these criteria: the right good (product or service), in the right quantity and quality, at the right time, and the right place for the right customer at the right price” (Kriegel et al., 2013, p. 78). Overall, online platforms only at a first glance ease the interactions. Insights from the ActiveAdvice project also put in evidence that, in spite of the fact that care consultancy is more often sought to be found in the virtual reality, the use of the internet is often reduced to a first consultancy rather than an ongoing advice. Indeed, customer engagement with a platform, on a regular basis, is context dependent, which is of importance to understand his/her first experiences and expectations with a platform. Concerning older adults, research has shown that a fear of losing social interaction, thus aggravating loneliness, can be connected to a minor adhesion to online platforms (Damodaran and Olphert, 2010; Novitzky et al., 2015; Olphert et al., 2009; Siegel et al., 2014; Teles et al., 2017). It has been reported that if technologies are seen as facilitators of new social interactions rather than replacing mechanisms of human interactions, this fear of losing social contact can be at least minimized (Lewin et al., 2010).

Based on a comprehensive, user-centred view of the constraints and facilitators for interactions in the virtual worlds, we argue that older adults can benefit from the integration of digital and human advice on AAL solutions, as a system that can capitalize the benefits of both advice formats. Concerning digital advice, studies have supported, for example, the

strong impact of virtual agents in the context of online-shopping, in addressing age related navigational needs (Rickel and Johnson, 2000). Moreover, within the context of the ActiveAdvice project, business representatives stressed the ‘neutral’ nature of digital advice mechanisms when it comes to guiding a consumer towards the solution fitting his/her needs. From a digital-human advisory integration point of view, a first and already stressed pragmatic argument relies on the fact that the digital divide still is a well-known challenge affecting older age groups, albeit in an unbalanced way across European countries. Contributing factors are poor ICT skills, fear of both the technology itself and the learning process, and a lack of financial resources to purchase devices and internet access (Doyle et al., 2013; Finn and Wright, 2011; Lewin et al., 2010; Marscholke et al., 2007; Sanders et al., 2012). However, it is also accepted that, to a certain extent, barriers associated with ICT skills will tend to decrease in future generations (Reginatto, 2012). In investigating two age cohorts, the digital natives (the Millennials), and the digital immigrants (the Baby Boomers), Bart et al. (2005, in Obal and Kunz, 2013, p. 47) concluded that age is a critical dimension when it comes to trust on online interactions. Millennials value time saving, e.g. navigation enabling a quick search of information, easy findings and shorter response times. Baby Boomers prefer security of their personal data. While Millennials appreciate information about the product and the seller right on the site, Baby Boomers don’t trust the sellers’ promotional materials and are more likely to look for consumer feedback (ibid.). It can be expected that, in a long run, platforms will become increasingly important. Millennials in particular are used to participate in virtual communities and in seeking consultancy with virtual experts. Yet, as the focus of AAL is on very specific needs, an AAL platform always will have to assure the bridge between virtual and real life. However, even if it is demonstrated that e-services for older adults need to take the potential impact of generational differences on online trust into consideration, we want to argue that the ICT uptake actually depends on the intersection of multiple factors. These are related with both technology features and users’ characteristics (e.g. age, gender, physical or cognitive skills, expectations, biographical experience) (Nedopil et al., 2013). Again, we can find very different profiles and preferences when it comes to service provision to older adults in the virtual and physical worlds.

Here is a second argument: besides idiosyncrasies regarding older adults’ preferences towards both

digital and physical worlds, growing old and being in need of support is usually a rather local or regional experience, even if projects generally are carried out in an international atmosphere. Thus, an interactive, highly flexible, approved and continuously updated platform needs to take that into consideration. This is to be able to support people with very specific needs in their regional contexts, as well as to give them access to an international community and knowledge base. Such complex logic in an optimal service provision to older adults is probably only achievable by using the ‘human touch’. In fact, requirement interviews for the ActiveAdvice project have shown that in spite of stakeholders’ recognition of high value of an online advisory platform, both consumers and business representatives stated that getting advice online still competes with the f2f experience. For customers, it is perceived as more trustworthy, while for companies it is seen as bedrock for consumers to engage and build a relation with the company (Teles et al., 2017).

A third argument summarizes what was stated earlier: An integration of real and virtual environments in engagement ecosystems enable C2C interactions. The co-creation of value is thus facilitated (Breidbach et al., 2014). This, so our fourth argument, enhances user trust on the services provided, both advice services or any others. Trust is, indeed, one of the most critical user/consumer issues (Cummins et al., 2014), and one of motives for supporting investments in digital-physical integration for service provision. In the digital sphere, consumers need to trust the website, the communication and, finally, if products are promoted on the website, in the products themselves. In AAL, trust was shown as a key attitudinal factor for solutions’ uptake (Olphert et al., 2009). From the requirement interviews carried out within the ActiveAdvice project, we drew similar conclusions and found that trust is, according to the stakeholders’ point of view, influenced by: the communication strategy and web-layout; the perception of neutrality regarding the information provided and the individuals providing that information; the perceived quality of that information; the access to real users’ feedback; and the perception that feedbacks are ‘fair’, i.e. not exclusively guided by negative incentives (Teles et al., 2017). Indeed, the presence of e.g. provider advice, privacy cues and community features have a high influence on trust in online platforms (Obal and Kunz, 2013, p. 48). Overall, we need to take into consideration that one obstacle for getting health information online by older adults is the perception that information available online has low quality, can

be biased or misleading, is frequently not run professionally, doesn't include peer-reviewed materials by independent actors, and the selection of the most reliable and suitable information is constrained by information overload on health issues Marschollek et al. (2007). Moreover, data security and data privacy, ethical and cultural issues as well as market development and legal regulations are crucial aspects that need to be considered to foment trust.

In summary, users are confronted with high complexity, which they hardly know how to manage. Therefore, knowing how to build-up trust and identifying the drivers of online trust are key responsibilities in service provision.

4 INTEGRATION OF HUMAN & DIGITAL ADVICE – THE ACTIVEADVICE APPROACH

The arguments exposed above strongly indicate that a platform for AAL products and services cannot be a stand-alone solution. Rather, it has to be part of an integrated and systematic service logic, incorporating both virtual and physical service logics and promoting the integration of different actors with different interests and contributions. As previously outlined: "People – whether consumers or service providers – are complex agents, with highly diverse cognitive frameworks, values and attitudes, physical and emotional needs (...) Service systems are thus complex to model and manage – but they may also be resilient and innovative. People can be empowered to act in non-mechanical ways, responding to unexpected circumstances and collaborating to solve problems. They can be linked together in new ways through new information technology" (Cardoso et al., 2014, p. 417). In the scope of advisory services on AAL solutions, we argue for the integration of digital with human advice. In fact, within the ActiveAdvice project we conceptualized the human advisor as an assistant for users helping in informed decision-making – a human addition to the ICT platform. Active Advisors are then foreseen to assist individuals in finding the right solution for their problem or needs. They are trained and follow a five-step procedure: (i) They listen to the need and translate it into a search strategy that complements the digital advisory component; (ii) they identify solutions and suppliers and assess their pertinence; (iii) they assist the individual in making the decision; (iv) they follow-up on satisfaction and stimulate users to provide a feedback on the platform; and (v) they

feed the platform with professional feedback or testimonies.

This human advisor workflow was conceived as being based on the following dimensions: (i) Assessment of products and services: the product and service database include a digital advice component fed by user and expert feedback; (ii) Training: offering basic as well as advanced training, covering the use of the platform and the TAALXONOMY (Leitner et al., 2015), up to the detailed level, for the different target groups according to their needs. Finally, the training should cover the decision-making process and how to enhance the quality of decisions, as well as how to create a human network around the digital community of the platform; (iii) Code of conduct: using a co-designed code of conduct as a mean to control and manage the quality of the interaction between offer and demand, i.e. neutrality, the compliance with minimum ethical standards, knowledge of the ActiveAdvice platform (achieved by following a training), acceptance to follow the code of conduct including the recording and handling of complaints, knowledge of the local situation (for the advisors who include this dimension in their service); (iv) Quality control, which will ideally be based on two systems: a user feedback on the platform, including scoring, and the possibility to leave comments.

The code of conduct and training are the two central elements of the accreditation of advisors. Even when the Active Advisors' role and workflows are globally well defined, we consider to be crucial to discuss who actually should provide advice to consumers. Here again, trust, as well as the integration of a multi-stakeholder perspective, are considered main challenges. Interviews with multiple stakeholders, when doing the requirements analysis, brought some interesting inputs. First, the need of neutrality of the Active Advisor is a shared concern by older adults and their caregivers, business and government representatives alike. However, for business actors, a paradoxical position emerged: while advice is perceived as being best given by those who sell a product, it can lead to disruptions in the neutrality condition though. Therefore, the solution could be the establishment of older adult panels to test products and services as well as the platform itself. Similarly, volunteers could act as advisors on the platform. Still, because of the complexity and the many open questions related to human advice and its importance for older adults, and due to the fact that different advisor profiles are probable to emerge in different local realities, the project is being used to test various profiles. These could include among

others e.g. care professionals involved in the process of assisting older adults and interested in applying AAL technologies and services; architects with an interest in adapting houses for special needs; individuals from all age groups who act as volunteers to assist their peers in living longer at home; public administration services in charge of assisting citizens in adapting their house or promoting active lifestyles; and, lastly, suppliers of solutions, including retailers (e.g. alarm systems, hearing aid) who might become Active Advisors as an advanced service for their customers.

5 CONCLUSIONS

In the AAL field, engagement platforms not only would promote AAL products and services but also empower stakeholders and facilitate the co-creation of value. Current service platforms promoting AAL technologies and supply for older adult health care services lack in most parts to provide either personalization and/or interaction opportunities among stakeholders – including C2O and C2C interaction –, which we consider a strong requirement for engagement platforms. Moreover, by considering the complexity characterizing service logics nowadays, we argue that an engagement ecosystem for AAL, particularly focusing on advice for AAL solutions, must integrate both digital and human advice and physical and virtual engagement platforms.

Furthermore, we see the shift from a purely online to an integrated logic as a path to enhance stakeholders' trust in advisory services, as well as to offer those AAL products and services which are at best suited to the individual context and situation. With a focus on the 'human touch', we conceptualized the Active Advisors as human agents providing assistance to users of the ActiveAdvice platform, in getting familiar with AAL products and services as well as in becoming part of a respective AAL online community. Those actors are of utmost importance due to a lack of personalized information, noticed when dealing with AAL products and/or services, and are fundamental for the creation of an engagement ecosystem. They answer to stakeholders' preferences for f2f contact, substantiated by the human interaction role in establishing trusty consumer-organization relationships. In this equation, trained and independent human advisors are required to safeguard trust in advisory services.

Another important issue to take into consideration is: Are human advisors also capable to reduce the

technology aversion and rejection? The latter is often linked to the lower experience older adults might have with technology but also with the idea of technology substituting human interaction. In linking technology promoted via an online platform with human advisory, we in a way oppose the frequently associated isolation and loneliness fear of older adults. Human advisors can help to overcome these fears, can encourage older adults to participate in digital communities, also with the intent of minimizing the digital divide, which is still affecting this age-group. In order to be an adequate complement to digital advice, those human advisors will always have to consider the heterogeneous profiles of older adults. Hence, different requirements have to be covered in the conceptual approach by defining tasks, which are adopted by the Active Advisors, such as the translation of needs into a search strategy, identification of solutions, decision support and follow up as well as feedback after the purchase. Active Advisors must be able to promote stakeholder involvement, interactivity and trust. In addition, it definitely is required to define Active Advisors profiles. For each profile, e.g. for an architect giving advice or volunteers offering their help, an understanding of roles, responsibilities and communication logics need to be further established.

Overall, when it comes to the development of an integrated system for advice on AAL, we recommend the promotion of engagement ecosystems where multiple stakeholders' profiles evolve together. Moreover, we favour a symbiotic approach combining human and digital advisory allowing for personalised guidance and reduced complexity in search operations. Feedback and evaluation mechanisms are a must-have in order to create social awareness and a sense of community regarding C2O and C2C interactions. The potentials of human advice for online engagement platforms on AAL products and services are, indeed, to be explored and we take into account different national, if not to say, regional specifics.

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