



WisdomOfAge: Developing a Seniors Digital Platform for Knowledge Transfer through Participatory Design

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Abstract: WisdomOfAge is a platform for knowledge transfer connecting retirees with experience in technological fields with industrial companies. The goal is to establish a mentor-mentee relationship between both parties. Companies will benefit from vast practical experience of seniors and the seniors from an opportunity to actively participate in their former field of work with a workload as high as they choose. This possibility promotes an individualized approach to retirement, active aging, and awareness of the work experience of (soon to be) retirees. Since the project is developed in close cooperation with older people, it also fosters inclusiveness within the technological development process.


1 INTRODUCTION


The increasing life expectancy of the average population and the continuously declining birth rate in Europe are leading to a general change in the age structure and in society (Eatock 2019). Its impact evokes many societal challenges and affects individuals and their life planning, as well as modern work environments. Especially due to the changes within the new age composition of the labor market (Cedefop 2016). Consequently, not only images of aging must be reconceptualized, but also the economy needs to reorient and adapt itself. In this context, the organization and perception of retirement are essential.


It is assumed that the transition to retirement is a major milestone in a person's life (Schmitt 2018; Yemiscigil et al. 2021). Retirees must face, among other things, the fact that they will no longer pursue their usual work activities. Even though there are


different ways of coping with this change of paradigm, and some do enjoy their newly found freedom, which allows a higher focus on family and voluntary work (Kojola & Moen 2015), others would still like to engage in some activities related to their background and experience. This may be explained by the fact that both paid and unpaid work can provide a daily structure, a social network as well as a sense of accomplishment (ibid.). The lack of such purposeful activities can therefore impact mental health and reduce a person's perceived quality of life (Boss 2016; Patel 2018). Consequently, some retirees wish to stay in touch with their field of work and share their experience even beyond retirement.


Overall, the retirement planning of the boomer generation (demographic cohort generally born between 1946 and 1964) has become more individualized (Kojola & Moen 2015). However, this individualization tendency can be brought into line with the activity theory. This theory assumes that a

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person wants to be and remain active and participate in social life (Rupprecht 2008). By maintaining an active lifestyle, older adults' benefit from long-lasting mental and physical health – which in the end also benefits society as a whole.

To proactively evolve, our society must address the individual needs of retirees.

Simultaneously, valuable know-how is lost, which is further intensified by the demographic change and the associated retirement of the boomer generation.

Depending on the type of company, this knowledge could be used in different work processes. For example, SMEs (small and medium-sized enterprises), which account for around 99% of companies in Europe (Gischer & Herz 2021), could benefit in their further development or optimization of intra-company processes, while start-ups would profit in the development and/or validation of their business models.

To counteract this loss of expertise, a more dynamic adaptation of the labor environment must take place via knowledge transfer between employees and people who will soon retire or who are already retired. This gap can be largely filled by providing mentoring and other similar services.

There are of course already several online providers (social platforms, media, or apps) trying to match these two demands – the desire to remain active after retirement and the request of life and work experience. However, most of those platforms only address the needs of younger users, especially when it comes to design, while neglecting those of older users, e.g., most of the existing platforms contain aggressive advertising, SPAM, complex error messages, etc.

This falls under the challenge of a growing 'digital divide' (see 2.1). With the digital transformation advancing, the digital divide is generally distinguished by a social disintegration that derives from an unequal distribution of access to technologies (Buchmüller et al. 2011). Said divide is largely influenced by the social factors of age, gender, and education (in the sense of 'laymen' and 'professionals') and often results in older adults being pushed to the margins of social participation (van Dijk 2006, Buchmüller et al. 2011).

In order to create an equal exchange between companies and seniors, the needs of older adults must therefore be given greater attention.

Accordingly, the project *WisdomOfAge*, or *WoA*, intends to develop a new platform based on interdisciplinary, participatory research. Thus, the platform aims to be both socially and developmentally inclusive.

First and foremost, the platform will be specifically adapted to the needs of seniors, while providing (industrial) companies with tools for enhanced knowledge management. Through *WisdomOfAge*, older people are supposed to be able to offer mentoring, guidance, and support to companies. This will create an innovative, flexible, and digital space to foster the formation of mentoring relationships between seniors and employees, thus contributing to active aging in a digital world.

2 AGISM AND THE RECOGNITION OF ADDED VALUE OF SENIORS 'EXPERIENCE

Agism – “a process of systematic stereotyping of and discrimination against people because they are old” (Butler 1975) – is a persistent problem among aging and digitized societies. People from their mid-60s and older are perceived as mentally slower, less healthy, and more resistant towards learning new things (Swift & Steeden 2020).

2.1 Agism within Digitalization

Although already present beforehand, agism became even more evident within the fourth industrial revolution (Schwab 2017) through the 'digital divide', where the component 'age' (see also 'grey divide') appears to be key (Friemel 2016). On the one hand, older adults exclude themselves when it comes to digitalization (Knowles & Hanson 2018), while on the other hand, they are excluded by researchers and product developers (Mannheim et al. 2019).

The marginalization of older adults in technology development is further aggravated by the phenomena of design paternalism and age-scripting. Design paternalism is the oftentimes implicit assumption that older adults should not be disturbed by technologies in their everyday life or when using them. They are thus at times denied creative appropriation processes of technologies as well as their autonomy and freedom in using technologies that are specifically targeted at them (Peine et al., 2014; Peine, 2019; Neven, 2010; Peine & Moors 2015; Peine & Neven, 2011).

Age-scripting, on the other hand, describes a process that is based on the premise that age(ing), technologies, and social contexts are inextricably linked. The age discourses based on this are then inscribed unfiltered into new technologies during the

process of technology development (Wanka & Gallistl, 2021), which in turn influences technology development unreflectively and therefore often unnoticed.

Design paternalism and the process of age-scripting are interdependent as and in so far that design paternalism can be seen both as a cause of age-scripting (as part of age discourses) and as a result of it (based on design paternalism emerging through age-scripts). These age-scripts as well as design paternalism are described as two contributing factors of agism in the field of Science and Technology Studies (STS) and Socio-Gerontechnology because of their restrictive, exclusionary, and possibly also disempowering nature (Peine et al., 2021). Wilkinson and Ferraro (2002) even argued that, in comparison to racist or sexist notions, ageist ideas are more likely to be accepted and even be internalized by older people themselves. They stated that: “Many aspects of our culture support ageism. Yet as individuals and as a society, we have become so conditioned by the prejudice and discrimination against age that we often fail to recognize its existence.” (Wilkinson & Ferraro, 2002).

Age studies have long shown that public images of aging perpetuated in media or marketing practice, shape the cultural lens through which we perceive and evaluate age and aging. Although yet understudied, it can be assumed that these views on aging (of individuals and in broader society) are crucially linked with the development of gerontechnologies. Images of aging are playing an integral and pivotal part that influence technology designs and how these technologies are marketed. Societally and personally held stereotypical views on aging can reach an ageist level and still end up getting implemented in technology design. This can e.g., be traced back to the oftentimes subconscious nature of said stereotypes and a lack of awareness of such biases. These patterns have been thoroughly observed and questioned by different researchers (e.g., Joyce & Mamo 2006; Neven 2010; Neven 2011; Vines et al., 2015; Cozza et al. 2017; Peine & Neven 2020). These images then not only perpetuate the public image of old age but also beliefs that older adults incorporate about themselves.

2.2 Added Value of Senior Experience

The aforementioned and other systemically engrained images, stereotypes, and beliefs in our society may in turn lead to the exclusion of older people, especially in the field of technology (including research and design) and innovation development (Mannheim et

al. 2019). However, this lack of inclusion has a negative impact on the ‘grey digital divide’ – which, contrary to assumptions, is not only a phenomenon of the current generation, but can also be passed on to future generations (McDonough 2016).

With the increasing number of people 65+, the economy, as well as the technology sector, will have to involve older adults in their development strategies eventually.

However, the inclusion of older people solely as consumers is not enough; more important is their involvement in the labor market.

The integration of older people leads to a higher age diversity in the labor market, which will benefit companies. Most older people have experienced various business challenges over the course of their careers, which enables them to approach problems with a more realistic outlook (Fischer 2020).

The interdisciplinary team of the WisdomOfAge project aims to work towards an inclusive project development as well as to demonstrate the added value gained from the experiences of older people within various work processes and acts as a counter-model to typical technology development processes.

Within the project, older people are not perceived as less capable, but as knowledgeable and experienced. In particular, their practical experience will assist the development and conceptualization of new ideas. In this context, older people are knowledge keepers and providers.

The reinterpretation of the role of older people leads to them not only being able to pursue new tasks and thus remain active, but also to be perceived as a valued member of society. WisdomOfAge thus aims to help aging societies adapt to the new demographic structure.

3 WISDOM OF AGE

The digital platform WisdomOfAge is being developed to serve as a bridge between people aged 60+ and industrial companies (mainly in technology-related fields). Through online courses, training, project management, mentoring, and more, older adults will share their knowledge with these companies within a project-based framework and therefore help them solve specific problems in their business.

Nevertheless, the goal is not only the knowledge transfer per se, but also the promotion of active and individualized aging.

During the first implementation phase, WisdomOfAge will focus on the fields of technology

and engineering. This initially defined target group will ensure that the subject field can be addressed more precisely.

Furthermore, there are currently no offers specifically aimed at older people in this market segment. Once successfully establishment in the labor market, the concept will be extended to other areas of work – such as marketing or data analysis.

For this project, however, the first step is to identify what seniors require and expect from the platform and its concept whereas the second step will be to create a platform that meets these requirements.

3.1 Interdisciplinary Approach

Within the project, SMEs, end-user organizations, and research institutes work closely together to reach the aforementioned goals. Therefore, the project consortium applies an interdisciplinary research and development approach.

While some of the project partners are mainly involved in data collection based on co-creation workshops, end-user testing, and evaluation as well as validation (Institute for Aging Research, IAF; in4Care, Happy Aging; see 3.2), others are focused on the further processing of the generated results, planning, implementation, and design of the platform, development of the algorithms as well as the business plan (Digital Twin, Technical University of Cluj-Napoca, TUCN, YumiTech, Arx iT). Consequently, team discussions and the gathering of different perspectives are an important part within the development process of the platform.

3.2 Participatory Design/Close Cooperation with End Users

Even though (Socio-)Gerontechnology slowly unfolds its potential scope and has begun to renew naïve techno-deterministic views of aging and technology through the emergence of empirical studies of the design and use of technology by and for older people (Peine et al. 2021), older adults are still oftentimes excluded from the development process of such technologies and their design (Mannheim et al. 2019).

However, in order to be able to change design methods of technologies and therefore apply more appropriate designs, developers of (geron-) technologies need to understand in which sense their products might be problematic regarding aging related issues.

One approach to counteract the digital exclusion of technology users is the introduction of

participatory design. It is an attempt to democratically involve marginalized groups, such as people aged 65+, in innovation processes of digital technologies and thus increase their chances of digital inclusion (Björgvinsson et al. 2010). Participatory design approaches can therefore be regarded as suitable methodologies to describe age in technology development, as long as they are enhanced by critical awareness of ageist patterns in society and symbolism (Peine & Neven 2019, Ernst & Horwath 2014).

Consequently, it is important to assign end users a leading role, especially in the early stages of the development process of WisdomOfAge. Their opinions and objections regarding the concept, the user-friendliness, and the design must be considered.

To do so, qualitative as well as quantitative research approaches are included in the development of the project. Since differences in social status, economic status, gender, personal history, or technology literacy can have major impact on how technology is or is not appropriated, how it is getting used or how it is getting modified by the end-user, especially qualitative research methods can help to better integrate the heterogeneity of the end-users into the final product. An aspect that is generally neglected, especially with older consumers (Mannheim et al. 2019). End-users are too often defined as homogenous entities and addressed in a simplistic manner, which neglects inter-subjective nuances (Light & Akama 2012; Gujit & Kaul Shah 1998).

In order to generate a scientific basis and to further develop a detailed concept, a series of co-creation workshops were held. Based on the feedback from these workshops, a prototype version is being developed while the platform's concept gets adapted. In a further step, more tests and focus group interviews will follow.

3.3 Matchmaking using an AI Agent

The target group of WisdomOfAge can be divided into two groups: Mentors and Mentees.

The mentors are (soon to be) retired engineers or people from similar work areas who offer their knowledge and experience. The mentees are expected to be industrial companies interested in technological and employee development who want to improve their knowledge in certain areas.

To ensure the best provider is found for each customer, a matchmaking tool is developed. To minimize the risk of incompatibility between mentors and mentees, an AI agent (artificial neural networks - ANN implementation) is put into place. An algorithm

thus matches mentors and mentees based on their needs, skills, and experience.

After an initial matching by the algorithm, a (cost-free) meeting is organized. Only when both parties are satisfied with the matching, the matching process is complete. Once the mentor and the mentee have been successfully matched, they can start working together in order to transfer their knowledge and experiences.

In addition to the matching offer between the provider and the customer, there is also the possibility to network between providers themselves. This way, even larger work teams may be formed, and the knowledge pool enlarged.

The first meeting after the initial matchmaking serves to develop an overall objective and strategy. Subsequent progress is customized through online meetings, discussions, and training.

The retiree (mentor) then shares his experience related to the company's (mentee's) particular problem using different online tools (e.g., video training, instructor led training or presentations, consulting).

The mentor's primary responsibilities are to advise, coach, and train the mentee to the extent of his or her abilities, to assist in the development of goals, to promote mid-term analyses of project development, and to motivate the companies to pursue their objective. In return, mentors get to continue or intensify their work in their field and thus pursue an activity that they enjoy and by which they receive additional financial incentives.

4 CONCLUSIONS

Due to the retirement of the experienced employees, knowledge is being carried out of the companies, namely the SMEs of Europe. To transfer their knowledge to younger employees, the platform WisdomOfAge is being developed. There, seniors can offer their expertise to companies in the technological field. The companies benefit from the practical experience of seniors who act as mentors. At the same time, this creates an opportunity for seniors to continue working in their field even after retirement, if desired. This enables them to engage in valued and generative activity that increase their opportunities for activity and social participation and thus possibly contributing to their well-being.

As an alternative to typical technology development processes, the interdisciplinary team of WisdomOfAge has implemented all-encompassing participatory design methods to counteract and

decrease ageist patterns, paternalism, and age-scripting in the platform's development.

Furthermore, WisdomOfAge aims to highlight that the experiences of people in the third and fourth age are important for a digitalizing world and should not be neglected in society.

WisdomOfAge therefore approaches the inclusion of the older population on two levels. First, it emphasizes the added value of the work experience of older people in terms of development and innovation planning during the platform's development process, and secondly, it also aims to include older adults in the workplace by valuing their knowledge and expertise and making it more easily accessible to companies. Through this, companies will be better equipped, the work experience of older people will be used more sustainably, and the platform will be created and adapted in a way to reduce agism and prejudices against older adults.

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REFERENCES

- Björgvinsson E., Ehn P., & Hillgren P. (2010). Participatory design and "democratizing innovation". Proceedings of the 11th Biennial Participatory Design Conference (PDC '10) (41–50). New York, USA, 29. November 2010. <https://doi.org/10.1145/1900441.1900448>
- Boss, V. (2016). Psychische Gesundheit bei älteren Menschen. In Blaser, M. & Amstad, F.T. (Eds.) *Psychische Gesundheit über die Lebensspanne, Grundlagenbericht* (pp. 107–116). Bern: Gesundheitsförderung Schweiz.
- Buchmüller, S., Joost G., Bessing N. & Stein S. (2011). Bridging the gender and generation gap by ICT applying participatory design process. *Pers Ubiquit Comput*, 15, 743-758.
- Butler, R.N. (1975). *Why Survive? Being Old in America*. New York: Harper and Row.
- Cedefop (2016). *Future skill needs in Europe: critical labour force trends*. Luxembourg: Publications Office of the European Union.
- Cozza, M., De Angeli, A. & Tonolli, L. (2017). Ubiquitous technologies for older people. *Personal and Ubiquitous Computing*, 21, 607–619.
- Eatock, D. (2019). *Demografischer Ausblick für die Europäische Union 2019*. Retrieved from

- [https://www.europarl.europa.eu/Reg-Data/etudes/IDAN/2019/637955/EPRS_IDA\(2019\)637955_DE.pdf](https://www.europarl.europa.eu/Reg-Data/etudes/IDAN/2019/637955/EPRS_IDA(2019)637955_DE.pdf).
- Ernst, W. & Horwath, I. (Eds.) (2014). *Gender in Science and Technology - Interdisciplinary approaches*. Bielefeld: transcript. 262 pages. ISBN 978-3-8376-2434-2. *Science & Technology Studies*, 51, 10.23987/sts.60276.
- Fischer, J. (2020). Age Diversity bringt Mehrwert. <https://www.zwk.ch/de/wirtschaft-politik/age-diversity-bringt-mehrwert-n1941> (10.01.2022).
- Friemel, T.N. (2016). The digital divide has grown old: Determinants of a digital divide among seniors. *New Media Soc.* 18, 313–331.
- Gischer, H. & Herz, B. (2021). *Aktuelle Herausforderungen für KMU und Regionalbanken in der Europäischen Union*. Brussels: Institute of European Democrats.
- Gujit, I., & M. Kaul Shah. (1998). Waking Up to Power, Conflict and Process. In Gujit, I. & Shah, M.K. (Eds.), *The Myth of Community: Gender Issues in Participatory Development* (pp. 1–23). London: Intermediate Technology.
- Hübner, Inga-Marie (2017). *Subjektive Gesundheit und Wohlbefinden im Übergang in den Ruhestand. Eine Studie über den Einfluss und die Bedeutsamkeit des subjektiven Alterns und der sozialen Beziehungen*. Wiesbaden: Springer.
- Joyce, K., & Mamo, L. (2006). Graying the cyborg: New directions in feminist analyses of aging, science, and technology. In T. Calasanti & K. Slevin (Eds.), *Age matters: realigning feminist thinking* (pp. 99–121). New York: Taylor & Francis; Routledge.
- Knowles, B. & Hanson, V.L. (2018). The Wisdom of Older Technology (Non)Users. *Communications of the ACM*, 61 (3), 72–77.
- Kojola, E. & Moen, P. (2015). No more lock-step retirement: Boomers' shifting meanings of work and retirement. *Journal of Aging Studies*, 36, 59–70.
- Light, A., & Y. Akama. (2012). *The Human Touch: Participatory Practice and the Role of Facilitation in Designing with Communities*. Proceedings of the Participatory Design Research Conference (61–70). New York, USA, 12. August 2012.
- McDonough, C.C. (2016). The Effect of Ageism on the Digital Divide Among Older Adults. *Gerontol. Geriatr. Med.* 2, 1–7.
- Mannheim, I., Schwartz, E., Xi, W., Buttigieg, SC., McDonnell-Naughton, M., Wouters, EJM. & van Zaaen, Y. (2019). Inclusion of Older Adults in the Research and Design of Digital Technology. *International Journal of Environmental Research and Public Health*, 16(19), 3718. <https://doi.org/10.3390/ijerph16193718>
- Neven, L. (2010). 'But Obviously Not for Me': Robots, Laboratories and the Defiant Identity of Elder Test User. *Sociology of Health and Illness*, 32(2), 335–47.
- Neven, L. (2011). Representations of the Old and Ageing in the Design of the New and Emerging: Assessing the Design of Ambient Intelligence Technologies for Older People. Enschede: University of Twente.
- Patel, Rina P. (2018). A study of impact of post-retirement work on psychological well-being of elderly. *Indian Journal of Mental Health*, 5(1): 63. doi:10.30877/IJMh.5.1.2018.63-67
- Peine, A. (2019). Technology and Ageing - Theoretical Propositions from Science and Technology Studies (STS). In Neves B., Vetere F. (Eds.) *Ageing and Digital Technology* (pp. 51-64). Singapore: Springer. https://doi.org/10.1007/978-981-13-3693-5_4
- Peine, A., Marshall, B.L., Martin, W., & Neven, L. (2021). *Socio-gerontechnology: Interdisciplinary Critical Studies of Ageing and Technology* (1st ed.). London: Routledge. <https://doi.org/10.4324/9780429278266>
- Peine, A. & Moors E.H.M. (2015). Valuing Health Technology – Habilitating and Prosthetic Strategies in Personal Health Systems. *Technological Forecasting and Social Change*, 93, 68–81.
- Peine, A. & Neven L. (2011). Social-Structural Lag Revisited. *Gerontechnology*, 10(3), 129–39.
- Peine, A. & Neven L. (2019). From Intervention to Co-constitution: New Directions in Theorizing about Aging and Technology. *The Gerontologist*, 59(1), 15–21. <https://doi.org/10.1093/geront/gny050>
- Peine, A. & Neven, L. (2020). The co-constitution of ageing and technology – a model and agenda. *Ageing and Society*, 41(12), 1–22. doi: 10.1017/S0144686X2000641
- Peine A., Rollwagen I. & Neven L. (2014). The rise of the “innosumer” – rethinking older technology users. *Technol. Forecast. Soc. Chang.* 82, 199-214
- Schwab, K. (2017). *The Fourth Industrial Revolution*. New York: Crown Business
- Schmitt, A. (2018). Übergang in und Anpassung an den Ruhestand als Herausforderung aus psychologischer Perspektive. *Organisationsberat Superv Coach*, 25, 337–347.
- Swift, H., & Steeden, B. (2020). *Exploring representations of old age and ageing*. Whitfield: Centre for Ageing Better.
- Rupprecht R. (2008). Psychologische Theorien zum Alternsprozess. In Oswald, W., Fleischmann, U., Gatterer, G. (Eds.), *Gerontopsychologie, Grundlagen und klinische Aspekte zur Psychologie des Alterns* (pp. 13-25). Vienna: Springer.
- Van Dijk, J. (2006). Digital divide research, achievements and shortcomings. *Poetics*, 34, 221-235. <https://doi.org/10.1016/j.poetic.2006.05.004>
- Vines, J., Pritchard, G., Wright, P., Olivier, P. & Brittain, K. (2015). An age-old problem: examining the discourses of ageing in HCI and strategies for future research. *ACM Transactions on Computer-Human Interaction*, 22, 1–27.
- Wanka, A. & Gallistl, V. (2021). Socio-Gerontechnology – ein Forschungsprogramm zu Technik und Alter(n) an der Schnittstelle von Gerontologie und Science-and-Technology Studies. *Zeitschrift für Gerontologie+Geriatrie*, 54, 384-389. <https://doi.org/10.1007/s00391-021-01862-2>
- Wilkinson, J. & Ferraro, K. (2002). Thirty year of ageism research. In T. Nelson (Ed.), *Ageism: Stereotyping and*

prejudice against older persons (pp. 339–358).
Cambridge, MA: MIT Press.

Yemiscigil, A., Powdthavee & N., Whillans, A. (2021). The
Effects of Retirement on Sense of Purpose in Life:
Crisis or Opportunity? *Psychological Science*, 32(11),
1856–1864.

