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Participatory Design of a Platform for the Promotion of Assistive Technology in Switzerland

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Abstract. Assistive technologies play a crucial role in supporting the aging population. However, in Switzerland, efforts to promote such technologies are hindered by a fragmented landscape—shaped by linguistic diversity and regionally isolated initiatives—making it challenging to provide older adults with consistent, accessible, and trustworthy information at the national level. This article presents the participatory design of a Swiss hybrid (offline and online) platform for assistive technologies. The process was carried out in three language regions of Switzerland and allowed to identify the needs of the platform stakeholders and to outline the key characteristics that such a platform should encompass. Older adults highlighted the importance of trustworthy information. For this purpose, the proposed technologies should be validated through long-term testing conducted by platform members, under the scientific guidance of an established network of living labs. Furthermore, the platform should facilitate the physical exchange of information, beyond traditional online websites.

Keywords: Assistive technology, aging, gerontechnology, participatory design, digital platform, Living Lab, knowledge dissemination

1 Introduction

The global population is aging, and by 2050, the dependency ratio—defined as the proportion of individuals aged 65 and over relative to the working-age population—is expected to reach 50% [1]. Switzerland is significantly impacted by this trend, with nearly 20% of its population already over the age of 65 [2]. Meanwhile, research shows that older people wish to stay independently as long as possible in their familiar setting [3, 4]. In Western societies, there is a strong emphasis on “ageing in place” [5]. This approach is founded on the belief that living in a familiar environment enhances

wellbeing in later life [6] and is more cost-effective than living in assisted living facilities [4, 7].

Assistive technologies offer a promising solution to address both the demographic shift and the growing desire among older adults to age in place. The World Health Organization (WHO) defines assistive technologies (AT) as "assistive products and related systems and services developed for people to maintain or improve functioning and thereby promote well-being" [8]. According to estimates by the World Health Organization, approximately one billion individuals currently require assistive technology, and this figure is projected to double by 2050 [8].

However, several barriers—including limited access, affordability, and acceptability— affect the uptake of AT among older adults [9]. Among these barriers, the lack of information and awareness emerges as a critical obstacle. Despite the growing availability of AT solutions, WHO highlights that many people remain inadequately informed about the options available, how these technologies operate, and where to obtain these solutions. [7]. This issue is not only highlighted in international literature but also reflected in local data: during the Swiss Roadshow "*New Technologies – New Way of Age(ing)"* — a travelling exhibition showcasing AT across different cities in Switzerland— informal interviews and conversations with approximately 250 visitors revealed that over half of them felt insufficiently informed about existing technologies [10]. This suggests that Switzerland faces similar challenges in raising awareness and promoting adoption of such technologies. Consequently, the use and acceptance of technological products for older adults is limited, and their potential is not fully exploited.

Attempts to provide comprehensive and up-to-date information about existing AT to the general public are sometimes short-lived and difficult to sustain over time. In Europe, for instance, two examples demonstrate both the potential and the limitations of such initiatives: the handbook maintained by the German Society for Gerontotechnology [11] (last updated in 2023), and the *Tested and Approved by Seniors* initiative of the French AFNOR Certification [12] (last updated in 2021). An analysis of products listed by AFNOR reveals the fragility of maintaining reliable information about AT: four of the 11 products presented on the AFNOR list are no longer available on the market, highlighting not only the difficulty of keeping such information up-to-date, but also the broader challenges consumers face in identifying trustworthy products with durable support and after-sales services.

Similar difficulties were encounter by AT platforms in Switzerland. CURAVIVA—the national association of care homes—launched an information platform about AT, but it was discontinued shortly after its introduction. Current Swiss initiatives to disseminate information about AT are until now limited to online websites presenting selected technologies (e.g., Margerite [13]) or local initiatives carried out by university-supported Living Labs (e.g., SimDec [14], Silver&Home [15]). While Living Labs play a crucial role in disseminating and co-designing and testing technologies with end-users, their impact remains constrained by a lack of coordination and national visibility. Their efforts are typically confined to specific regions and do not systematically reach broader or more vulnerable segments of the population—especially those less engaged

with digital platforms or hesitant to participate in academic settings [17]. Moreover, Living Labs often face structural and financial challenges, as many rely on temporary funding, [18, 19], making their activities—including AT evaluation and information dissemination—limited in time and scope. Without a sustainable framework, their work risks remaining isolated, despite its relevance for promoting adoption of assistive technologies.

To fully leverage their potential, Living Labs must be supported through better collaboration mechanisms and integrated into a coordinated national strategy. Strengthening these local hubs through a shared platform could enhance their reach, improve continuity, and ensure more equitable access to validated information on assistive technologies.

In response to the challenges of fragmented dissemination, limited national coordination, and the digital exclusion of vulnerable populations, this paper presents the design of a hybrid (online and offline) platform aimed at improving access to information on AT for older adults in Switzerland. Recognizing that many existing initiatives are either short-lived or confined to regional efforts, our approach seeks to create a sustainable, nationally coordinated infrastructure that builds on the strengths of local Living Labs while addressing their limitations in reach and visibility.

Unlike traditional approaches that primarily involve older adults and gerontechnology companies in product design and testing phases, our objective is to involve them from the very beginning, i.e., during the co-design of an information platform for assistive technology. By ensuring their active participation throughout the platform's lifecycle, we aim not only to obtain better usability and trust in the platform, but also to foster a sense of ownership and empowerment among the older population. In turn, this could also enhance the long-term sustainability of the platform, thanks to the active involvement of the older population. The next sections provide an overview of related work on co-design practices with older adults (Section 2.1) and existing platforms designed to promote and facilitate the adoption of assistive technologies (Section 2.2), with particular attention to initiatives led by Living Labs highlighting its added value for applied research and innovation (Section 2.3). On that basis, in Section 3, we introduce the Swiss Silver Platform, a project developed within the Innovation Booster "Co-Designing Human Services" a Swiss initiative that supports the development of user-centered social innovations through co-design and prototyping, with a focus on ageing and care services. This paper focuses on activities carried out over a one-year period, structured into three main phases: ideation, discovery, and testing (presented respectively in Sections 3.1, 3.2 and 3.3). This structure was predefined by the Innovation Booster program. For each phase, we outline the goals, and the methodologies employed, and the results obtained. Finally, in Section 4, we discuss our findings and provide recommendations for the development of similar platforms in the future.

2 Related work

2.1 Participatory Design with Older Adults

Co-design, or participatory design, is a collaborative process where end-users are actively engaged in shaping the development of products or services [20]. Unlike traditional top-down approaches, co-design ensures that the specific needs and preferences of the target audience are embedded in the design, leading to more inclusive, user-centred solutions. This methodology is particularly relevant for older adults, who often face barriers related to usability and accessibility with digital platforms [21]. Through active participation, co-design improves both the usability and social relevance of platforms for older adults, enhancing their adoption and overall effectiveness [22]. In the context of healthcare, co-design plays an essential role in addressing the unique health needs of older adults, particularly those managing chronic conditions and multimorbidity. Platforms such as ProACT, developed through co-design with older adults, demonstrate how participatory processes can create personalised, accessible tools that significantly improve engagement and health outcomes [23]. Similarly, participatory methodologies have been applied to co-design interventions that encourage physical activity and support mental health, empowering older adults to take an active role in managing their well-being [24].

As Mannheim et al. [26] highlight, research on technology for older adults' risks bias when their perspectives are not sufficiently considered in the design process, which can lead to the creation of platforms that are disconnected from their real needs. Mannheim et al. [26] argue that omitting older adults from co-design processes can result in “technological paternalism”, where platforms are designed based on assumptions rather than real input, leading to disempowerment rather than empowerment. Addressing this bias is critical to ensure that co-designed healthcare platforms are truly user-centred and ethically sound.

Additionally, issues of digital equity must be considered in co-designing healthcare platforms for older adults. Many older adults face challenges such as limited access to technology or lower levels of digital literacy, which can exclude them from fully participating in the co-design process [27]. Furthermore, co-design ensures that individuals from diverse socio-economic and digital backgrounds are included, making the platforms more accessible and equitable. This includes designing interfaces that are simple, intuitive, and responsive to the varying cognitive and physical abilities of older users [28].

Moreover, co-designers must address the long-term sustainability of healthcare platforms. Even when older adults are actively engaged in the design phase, many digital solutions are abandoned if adequate training and support are not provided post-launch [26]. Ensuring the longevity and continuous usability of these technologies, through customer support for software troubleshooting and technical support in case of system failure is a key ethical responsibility.

The Swiss Silver Platform aims at addressing this challenge through the co-design of a sustainable platform for assistive technology. We believe that considering these principles and involving older adults in the design process, it is possible to create a sustainable platform that not only meets practical needs of older adults and informs

them about possible AT but also gives them the possibility to participate in their development.

2.2 Information Platforms on Assistive Technology and Participatory Evaluation of Assistive Technology

Information on available AT is a major barrier in terms of accessibility [29–31]. This applies to both older people and other stakeholders: Relatives, health care professionals, politicians, institutions for older adults, etc. The ever-evolving nature of the AT field, with continuous innovations and new providers entering the market, makes it increasingly challenging to maintain a clear overview of the landscape. The marketplaces are also very diverse: they range from healthcare practitioners and clinics that recommend or dispense technologies directly to their clients to private marketplaces where technology manufacturers market products online directly to end users [29]. Building a platform that provides up-to-date information on AT and perhaps even matches needs and offers is a possible solution to make AT products more accessible [31]. But in the rapidly changing field, it is a major challenge to stay up to date. The easiest way is to search for information online. The provision of relevant information is mostly via commercial providers of products and is focused according to their interests and there are few independent recommendations on products [31]. In addition, the barriers to searching for information online are particularly high for older people due to the second digital divide [29]. Information is therefore a bottleneck in terms of access to AT [29]. As a solution, Danemayer et al. suggest developing an information platform together with various stakeholders to cover their different needs [29].

To the best of our knowledge few initiatives for co-designing platforms for assistive technologies have been carried out so far. A notable initiative has been carried out in the context of a transnational collaboration among six Baltic countries [33]. The Digital Silver Hub project was based on a quadruple helix innovation process [33], a partnership between academia, industry, government, and civil society, which is often adopted by living labs.

Therefore, in the next sub-section, we complete our analysis of related work with a discussion of the role of living labs as promoters of assistive technologies.

2.3 Living Labs as Space for Information, Co-creation and Real-World Testing of Assistive Technologies

Traditionally, new technologies are developed by experts and undergo short-term testing in laboratories under artificial test conditions [34]. Such settings are often limiting and cannot guarantee real-life applicability of results. Especially when it comes to technologies for older adults, the fact that young designers develop products for this population can lead to wrong assumptions [22, 35, 36]. Assistive technology should be co-created with the target age group and tested over a longer period in real-life settings.

Living labs constitute a typical facilitator for co-creating and testing innovations with target users. As the Living Lab concept was developed in the beginning of the 21st

century [37, 38] and is quite new, a standard concept has not been formulated [39, 40]. Two basic approaches currently exist: (1) The Living Lab concept according to William Mitchell of the Massachusetts Institute of Technology (MIT) (Open Living Labs, 2016), which defines a Living Lab as an artificial laboratory that can be inhabited; and (2) the Living Lab concept as real, domestic, everyday environment of the users which is used for tests [41–43]. According to the European Network of Living Labs (ENoLL), Living Labs are: "open innovation ecosystems in real-life environments based on a systematic user co-creation approach that integrates research and innovation activities in communities and/or multi-stakeholder environments, placing citizens and/or end-users at the centre of the innovation process" [16].

In the context of AT, Living Labs can serve as an information interface and space for co-creation and evaluation. Living Labs can reach older adults living in their private households or in retirement or nursing homes (natural living environments), and technical innovations are co-created or tested directly with the end-users, i.e., older adults themselves, or by the secondary users, i.e., caregivers or relatives. Taking place in everyday life and natural living environments, the end-user, as a central evaluator, becomes a key factor in the process of participative development of innovative technologies. Thanks to participatory involvement, end-users can give direct feedback as early as possible within the innovation process. Therefore, products and services can be developed, tested, and improved in an iterative manner.

To catalog Living Labs operating in Switzerland on assistive technologies and share their best practices and activities, a working group of ten Living Labs has been formed since 2022. The group gathers Living Labs operating at different levels and with different objectives. While eight of them sprang from an academic context, only one came from a private company and one from a nonprofit foundation. Living Labs affiliated with universities generally rely on research fundings, with only a few Living Labs able to operate thanks to mandates by companies. Some Living Labs, such as the Senior-Lab [44, 45], co-create and test a broader spectrum of products and services for older adults and not only AT. Some Living Labs, such as SimDec [14] and Silver&Home [15, 46], have, or had, a physical space for showcasing and testing assistive technology.

While such spaces are commonly created to replicate the living conditions of older adults, the evaluations carried out within them are generally limited to short-term usability assessments. Other Living labs, such as the Living Lab 65+ [34], organize also longer-term tests of assistive technologies, but those tests are conducted in residential care homes or in the private homes of older adults. Products tested by Living Labs are often chosen based on the specific collaboration with companies, lacking overview and comparison of similar assistive technologies.

The heterogeneity of activities and business models of current Swiss Living Labs for assistive technologies show the lack of standardization and of an impact at national level for promoting the use of AT among the older population. Such fragmentation pushed two Living Labs to look for a new model able to federate the local efforts of each Living Lab, ensuring a broader impact at national level and, possibly, for a sustainable business model able to guarantee up-to-date and relevant information on assistive technology for the relevant stakeholders, beyond time- and resource-bound research projects.

3 Swiss Silver Platform

In response to the lack of a national, trustworthy and up-to-date information infrastructure on AT in Switzerland—exacerbated by fragmented initiatives, limited digital access for vulnerable populations, and the short lifespan of prior online platforms—the Swiss Silver Platform project was developed to explore possible solutions through a participatory design approach. The Swiss Silver Platform project pursued two main objectives. First, it aimed to design a new, sustainable information tool for AT – conceived as hybrid platform that combines an online website with offline component to ensure broader accessibility; second, it sought to design a scalable process for promoting co-creation and testing activities across Switzerland. Both objectives are guided by the overarching aim of fostering the adoption of AT. While existing living labs in Switzerland play an essential role in co-creating, testing, and refining technological solutions with the involvement of older adults, caregivers, and researchers, these efforts are often regionally confined and lack a unified, national strategy for dissemination. The Swiss Silver Platform aimed to bridge this gap by coordinating these initiatives, providing a centralized tool to enhance information, collaboration and accessibility. Through this platform, we sought to assess public interest in AT, identify technologies most relevant to older adults, and devise effective strategies for information dissemination. To achieve those goals, we emphasized involving older adults in the co-design of such a platform to sharpen our ideas, ensuring their participation, and fostering innovation on a national scale.

This project was developed by an interdisciplinary team as part of an Innovation Booster initiative, funded by the Swiss innovation agency Innosuisse, from May 2022 to March 2023.

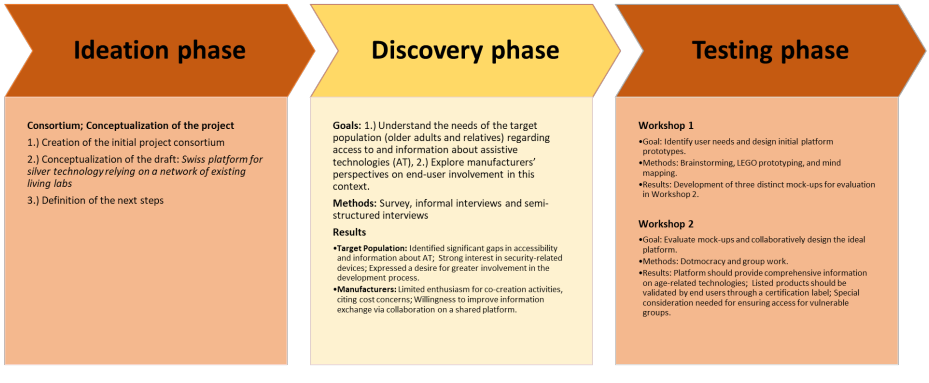

Fig. 1. Summary of the project phases and activities carried out in the frame of the Innovation Booster program.

In line with the Innovation Booster program's structure, the project was organized into three phases – *ideation*, *discovery*, and *testing* – each contributing to a

progressively refined understanding of user needs, stakeholder dynamics, and the practical requirements for building such a platform.

During the ideation phase we focused on refining the project concept and outlining the necessary steps for the next project phases. The discovery phase aimed to explore the challenges older adults face in accessing information on assistive technologies. To understand the viewpoints of manufactures and their approach to the involvement of older adults in the development of these technologies, we also conducted a survey and interviews with interested companies. Finally, the testing phase centred on the co-design of the actual platform to be developed. The three phases and respective activities are summarized in Fig. 1.

3.1 Ideation Phase

The ideation phase lasted one month and allowed 1) the creation of the initial project consortium, constituted by three Swiss universities– some having access to a living lab to test assistive technologies; 2) the conceptualization of the first project concept of the Swiss Silver Platform; and 3) the specification of the research activities for the project's second phase to assess the preliminary concept. The ideation phase was conceived as a preparatory stage, which is why the co-creation approach was only implemented in the subsequent two phases.

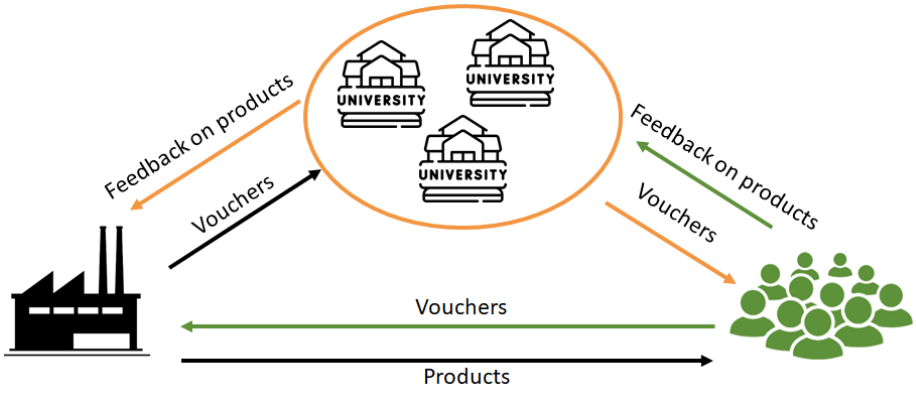

Fig. 2. Representation of the triangular collaboration between assistive technology companies and end-users, mediated by a consortium of Living Labs led by universities that organize co-creation and testing activities in the different language regions of Switzerland.

The initial concept of the Swiss Silver Platform consisted in a triangulation between three actors, namely, companies, older adults and universities that acted as mediators for the co-design and test of the technologies proposed by the companies, that will be tested by older adults (Fig. 2). The platform would federate co-design and testing activities at national level and reward end-users, i.e., older adults or caregivers participating in the co-design and testing activities with vouchers, discounts to be used to buy products from the Swiss Silver Platform partner companies. Living labs would

have the role of collecting and summarizing feedback in the different local co-design and testing activities, sharing results with companies to improve the products.

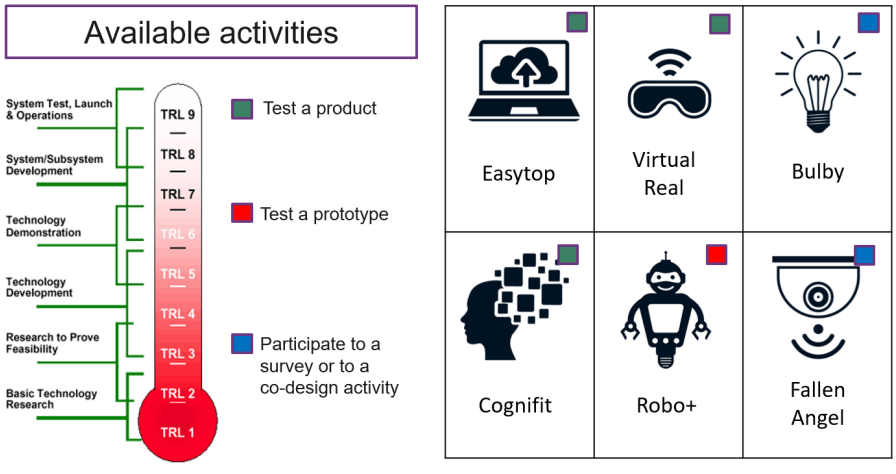

Fig. 3. Representation of the available activities on the platform according to the different readiness levels of assistive technologies.

The innovation and related co-design and testing activities proposed by the companies would be displayed on the Swiss Silver Platform website, showing the different technology readiness level of the products assessed through the platform (Fig. 3). At this stage, all assistive technologies were considered for inclusion in the platform.

Upon concluding this phase, the review committee of the Innovation Booster Program recommended narrowing the platform's focus to ensure a successful launch of its operations. Therefore, the main goal of the next phase was to understand with the main stakeholders (older adults and companies) which activities should be carried out by the platform and which technology we should focus on.

3.2 Discovery Phase

In this phase, which lasted three months, the goal was to assess the needs of older adults in terms of AT and the viability and financial sustainability of the platform in respect to the collaboration with companies proposing AT. The concept of the platform designed in the Ideation phase was used as a starting point for the discussion with these two stakeholders. In particular, in order to co-design a platform that reflect older adults' needs, we wanted to gain a deeper understanding of the needs surrounding AT with respect to information, as well as learning more about the general needs and concerns within the field of using digital technologies.

Needs of the Target Population. To understand the needs of the target population regarding AT and (digital) technologies in general we conducted a paper-and-pencil survey comprising both closed- and open-ended questions, complemented by informal

interviews. The survey included questions about the demographics of the participants as well as questions about participants' knowledge of aging technologies, their usage, accessibility, and perceived relevance for themselves and their relatives. We asked about the (digital) technologies used in everyday life, how confident people feel when using digital technologies, whether they are currently using technologies designed for older adults, their expectations and concerns regarding such technologies, where they find out about new technologies and how they perceive access to these technologies.

The construction of the surveys and interview guidelines for end-users was based on a literature review about existing technologies and their use amongst older adults (cf. Seifert&Charness [47]).

We conducted about 31 online/paper and pencil surveys with older adults aged 55 and above and complemented those data with informal interviews, which were conducted during the age-technology Roadshow 2022 [10]. Surveys and informal interviews were hold in the main three Swiss official languages (German, French and Italian), depending on the city hosting the roadshow. Since the data collection took place during a public event, the sampling was opportunity driven and is therefore not representative of the whole population but rather focuses on people already interested in technologies.

The surveys revealed that more than a third of the respondents were professionals working in social fields such as social work or older care and use technological devices like cell phones, computers, and tablets daily, highlighting a rather high education. When it comes to technology for older adults, only professionals within older care or relatives of older adults indicated to use them for/with their older relatives or patients. All participants were using technologies daily but only mentioned the usage of assistive technologies related to their work.

Notably, over 75% expressed interest in using technologies for older adults in the future. In the survey and informal interviews, participants consistently used terms like “old” or “technologies for older adults” to describe others, never applying these labels to themselves. This suggests a strong reluctance to self-identify as “old”, even when discussing technologies designed specifically for older age groups and shows that AT should not be branded as technologies for older people

Furthermore, all respondents agreed that the importance of technologies for older adults will increase, particularly in relation to promoting autonomy and enhancing security. Desired technologies include those addressing dementia and safety, with the latter seen as complementary. Over 66% indicated a desire for consultations, such as in-store guidance, and a better information flow, not knowing where to inform oneself. Approximately 50% expressed interest in helping test prototypes. No specific differences were found among the language regions; however, older adults from the Ticino region (Italian speaking region, corresponding to about 4% of the Swiss population) perceive their area as neglected.

Needs from Companies. To understand the perspective of the manufacturers active in the field of technologies for older adults, and the long-term sustainability of the platform, we conducted an online survey followed by semi-structured interviews. The goal of these two activities was to assess the interest of these companies in co-creation and testing activities (and how much would they pay for such activities) and the

possibility and interest in providing vouchers to the end-users that will participate in such activities, as well as the specific interest in expanding their business in specific language regions of Switzerland, or in nearby countries. Participants were also asked about the types of technologies being developed for older adults, the distribution channels that are used, and the ways in which these technologies are tested, including the specific phases of development in which testing occurs.

Manufacturers who answered the questionnaire were further engaged through semi-structured telephone interviews to explore specific topics in greater depth.

The survey was distributed via email to over 170 industrial contacts within the project team's network. To reach a broad audience, it was translated into four languages—English, German, French, and Italian—and accompanied by a concise project presentation and an introductory video.

Despite these efforts, the response rate was limited, with only six companies participating: five from Switzerland and one from Belgium. It is worth noting that about one third of the company email addresses collected by one living lab in the previous 2-3 years were not operative anymore (company website being offline, impossibility to deliver the e-mail, etc.). This highlights the difficulty of identifying and providing information about companies for AT that can ensure long-lasting after-market support. The companies participating in the survey had a median number of 15 full-time employees. All respondents specialized in security-related technologies, such as fall detection, geolocation, and home automation. One company also offered solutions aimed at enhancing social connections.

To supplement the survey data, telephone interviews were conducted with six respondents and three additional manufacturers. This ensured a balanced representation from both the German- and French-speaking regions of Switzerland, as well as perspectives from international companies.

While interest in co-design services—such as workshops or usability testing—was limited, particularly when associated costs would fall on the companies, some showed strong enthusiasm for collaborating on pilot test of their products. Three manufacturers expressed a willingness to contribute materials for user testing and actively participate in the initiative. Their willingness to engage in co-creation strategies was conditional upon minimizing additional costs, and they expressed a specific interest in involving end users in product testing as part of a collaborative approach. About half of respondents were already supporting promotional codes or vouchers or would be able to integrate them into their selling channels without effort.

On one hand, the survey and interviews with the target population provided valuable insights by capturing perspectives from different language regions in Switzerland and assessing public awareness and usage of age-related technologies. Results revealed significant gaps in accessibility and information, alongside a strong desire for greater involvement in the development process. Security devices emerged as the most favored technologies among participants. On the other hand, manufacturers showed limited enthusiasm for adopting co-creation approaches, particularly when these might increase costs. However, they expressed openness to a centralized platform for sharing information and technologies, recognizing its potential to streamline collaboration and dissemination.

3.3 Testing Phase

The results from the discovery phase made it strikingly clear that the development of a platform to improve access to information about age-related technologies and the devices themselves was essential. At the same time, we sought to understand the extent to which older adults wished to be involved in the development process. Using an iterative approach, the third phase, which lasted six months, focused on visualizing and refining the concept of an ideal platform tailored to the needs and preferences of older adults, ensuring usability and accessibility at every stage. In this phase, we focused on collaboration with older adults (aged 55+) and organised two rounds of workshops in Zurich, a German speaking city, and in Bulle, a French speaking city. The first round of workshops focused on the users' needs regarding assistive technologies and on the participant vision of a national platform for assistive technologies. The second round of workshops was grounded on the results of the previous workshops and refined the understanding and the desired features of the hybrid platform through three platform mock-ups that were evaluated and reworked by participants to obtain the design of their ideal platform for assistive technology.

Workshop 1. The first workshop included a brainstorming part to assess needs with regards to assistive technology, and a second part that focused on the design of the platform, through LEGO prototyping and mind maps. As a final activity, dotmocracy was used to identify the main features of the platform. A total of seven participants took part in the first workshop in Bulle, while eight attended the workshop in Zurich. 10 of the 15 participants were women. The Bulle workshop was organized by a local senior association, while participants in Zurich were engaged through a Living Lab network. The sampling was based on opportunity, and all participants were aged 55 and older, with no additional selection criteria applied.

During the brainstorming session, participants were asked to work individually and note their (or their relatives') daily problems and needs, as well as their relationship regarding AT on post-its. To guide their thinking, we provided three key questions, which were written on different coloured post-its: Yellow for "What are the main problems in the daily life of seniors?"; Orange for "Which assistive technologies are already used, and are they useful?"; and Blue for "In which context could assistive technologies be useful in the future, and why?"

Once participants had written down their ideas, we grouped the post-its by topic according to the guiding questions. This revealed a strong desire for the simplification and enhancement of existing technologies. Many suggestions, such as security devices, were already available on the market, indicating a need for improved information flow to the end-users. Another important finding was the prominent focus on the security topic.

In the next phase, participants were asked to use LEGO serious play [49] to create their vision of the ideal platform for accessing technologies for older adults (Fig. 4). However, most groups preferred to express their ideas writing them down or drawing a mind map rather than using LEGO serious play.

Fig. 4. Example of the outcome of a group using LEGO bricks to design the ideal platform for assistive technology. The designed platform structure highlights the need of a central pillar to bridge the gap between the different stakeholders around the country, which included seniors, healthcare professionals and companies. Participants also highlighted the need to restrain the access to the platform only to companies and products that were meeting specific criteria. Transparency was also sought (with a transparent LEGO brick in the central pillar).

To conclude the first workshop, we assessed the main features wished by participants about the platform, through a grid containing the following themes: 1) knowledge/overview, 2) community, 3) platform for innovation/co-design, 4) evaluation/testing, and 5) online shop. Each participant was given three votes to allocate. The theme of knowledge/overview stood out clearly with 19 points out of 45, while Rating/Evaluation received 13 points. However, the results showed a clear difference between the two workshop locations. While Zurich participants focused on knowledge transfer and evaluation, Bulle participants prioritized community. For both groups, an overall evaluation system of assistive technology was deemed essential. The possibility of buying products from the platform got mixed results, with none of the participants interested in Bulle, while some participants voted for this feature in Zurich.

To analyse the workshops, we documented the sessions and conducted a thematic analysis of the feedback.

Our key takeaway from the first workshop was that older adults primarily face societal challenges such as loneliness, mobility restrictions, health issues, hygiene concerns, bureaucracy, and the increasing digital divide. They showed interest in technologies like motion detectors, mobility aids, household devices, and reminder systems. There was a clear demand for simpler and more user-friendly designs, and many of the specific suggestions already existed in the market, highlighting a need for better information dissemination to the older population.

The workshops revealed that the website should primarily target older adults and their families, but should also provide value to other stakeholders, such as retirement homes, home care services, and municipalities. Key aspects to address include

transparency, financing, and certification. Additionally, identifying the operator of the website is a crucial consideration moving forward.

Platform mock-ups. The main insights collected from the first workshop enabled the project team to design three mock-ups, which aimed at exploring different variations of platform aspects that had still to be clarified with end-users (e.g., platform ownership, features of the web sites, activities to be carried out in-presence and online). The three mock-ups served as material for the second workshop, with the aim of selecting the characteristics of the ideal platform for assistive technologies. The prototypes depicted alternatives of websites, each hosted by a different recognizable and trustable operator (with the aim to identify a sustainable host and partner for the platform). Each website was constituted by different pages. It contained at least a homepage, a section with assistive technologies and a section about the proposed activities, including activities conducted in-presence. The web-site mock-ups had been designed in Figma and were then printed and collated to be handed-out for analysis to each participant

- Prototype 1: Knowledge transfer – This prototype emphasized the delivery of information, helping users easily access resources about technologies available for older adults. It aimed to serve as an informative hub, guiding seniors through the vast array of existing products and services, ensuring that they could understand and utilize the available options. It included a range of in-presence activities, such as testing sessions, a national assembly meeting and seminars about AT. It also included an information page for financing AT. For this prototype, the platform would be operated by a national care service provider (Fig. 5).
- Prototype 2: Evaluation – This prototype focused on the assessment of technologies, aiming to create a platform where users could find reliable evaluations and feedback on different age-related technologies. It was designed to empower older adults by providing them with detailed reviews and ratings of products, helping them make informed decisions based on real-world experiences. While the website proposed mostly activities to be carried out online, in-presence testing sessions were also advertised. For this prototype, the platform would be operated by a private operator, such as a supermarket chain (Fig. 6).
- Prototype 3: Community – This prototype placed emphasis on fostering a sense of connection and support among older adults. It aimed to create a community where older adults could interact, share their experiences, and offer support to one another. The platform would provide a space to connect with peers, discuss challenges, and share information about assistive technologies, leveraging living labs, senior associations and other local organizations for older adults' care. Local testing activities and conferences about AT were also advertised in the web site. Testing activities would contribute to the evaluation of AT, allowing to generate labels and ratings for the tested products. For this prototype, the platform would be operated by universities, federated through a network of living labs (Fig. 7).

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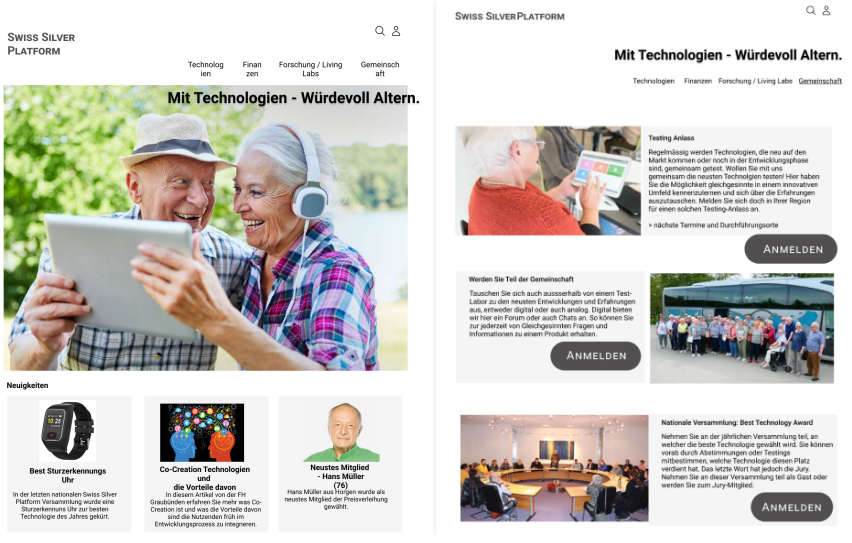

Fig. 5. Prototype 1: Knowledge Transfer. Front page and activity page.

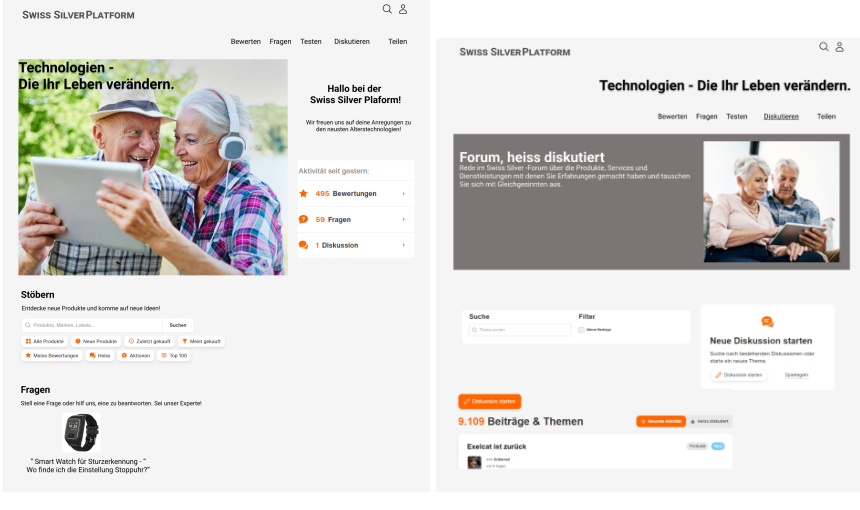

Fig. 6. Prototype 2: Evaluation. Front page and online forum page.

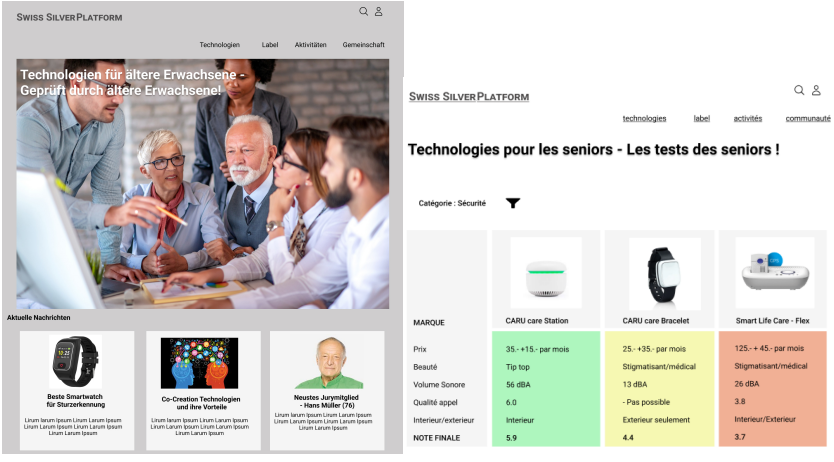

Fig. 7. Prototype 3: Community. Front page and label page.

Workshop 2. The goal of the second workshop was to evaluate the three mock-ups using the dotmocracy method, which allowed participants to rank and comment on the specific features of each design. The aim was to identify how the website of the ideal platform should be structured according to the key areas of interest (i.e., which activities should be carried out) and determine the most suitable type of platform operator. It also allowed to investigate which key elements of the platform should be available online or offline. The second workshop took place in Zurich with eight participants, and in Bulle with eleven participants, making a total of 19 participants, with a majority of women. The session was divided into two parts: 1) individual work and 2) group work, including group and plenary discussions.

In the individual work session, participants were given printed versions of the platform concepts. They spent 30 minutes reviewing and evaluating the mock-ups using dotmocracy. In the group work phase, participants were divided into two groups to discuss their impressions and collaboratively build their ideal website. They could cut out elements of the mock-ups that they did not like and add new ideas. The groups then presented their concepts to one another, sparking thorough discussions.

Overall, participants felt the prototypes should emphasize either knowledge transfer or communities, with seven out of 19 preferring Prototype 1 and 11 out of 19 favouring Prototype 3. Prototype 2 received no votes as the preferred design.

During the discussion, participants suggested that funding opportunities for end-users interested in specific technologies should be prominently featured. There was broad consensus in favour of this approach, and participants emphasized that the wording should be simplified for clarity. They also emphasized that an online website alone would not reach enough people and that the platform should also be implemented offline, leveraging local organisations. Regarding the platform operator, one of the four groups preferred a private operator, while the others leaned towards a public entity. Participants from Bulle supported the idea of shared leadership for the platform, involving all stakeholder groups.

Key takeaways from the workshop included the following conclusions for the platform design:

1. The platform should provide information about products (both online and offline).
2. Products listed on the platform should be validated by end-users and carry a certification label.
3. Engaging local stakeholders is essential for reaching a wider audience, especially more vulnerable groups.

These insights will guide the next steps in the platform's development, ensuring that it is tailored to the needs and preferences of older adults.

4 Discussion

This section summarizes and discusses the main themes emerged from the activities carried out during the Swiss Silver Platform project.

4.1 Need for a Reliable Information Platform about AT

The findings from the discovery and testing phases confirm that assistive technologies (AT) are seen as very important for supporting autonomy in later life. However, most consider access to these technologies, and to related information, as a challenge. A national hybrid platform would therefore play an important role in making AT easier accessible to the target group [29–31]. Participants wished for a trustworthy online and offline platform, a hybrid space that it is not limited to advertising of AT, but that provides also valuable information to make people choose which technology they should adopt. All persons surveyed during the discovery phase agree that the topic of assistive technologies will become increasingly important in the future, especially in relation to the key theme of safety. AT capable of addressing safety-related issues are vital in enabling older adults to age in place as falls are among the greatest risks to the independence and well-being of older adults [4]. As target user groups for the platform, workshop-participants defined older people, their relatives, carers, retirement institutions and municipalities. Furthermore, they regard as essential that the platform is designed to be very simple and user-friendly, and that the information is presented in simple and understandable language. Other topics that workshop participants consider important are loneliness, limited mobility, health and the feeling of an increasing digital divide. Concerns were also raised in connection with technology, particularly the fear that it could replace human care. The Swiss Silver Platform should therefore address these points, in particular educating about how AT could be used to support caregivers and health professionals in assisting older adults, rather than to replace their cares.

The current lack in Switzerland of independent sources of information about existing AT and about its role in supporting older adults' care may hinder the adoption of assistive technology. Indeed, D'Cunha et al. [30] showed that information provided by technology suppliers, especially manufacturers, may be biased compared to the

information provided by brokerage services. This resonates with the second theme emerged from our activities, the need of a reliable system for validating AT.

4.2 User Validation and the Role of Living Labs

A recurring theme from the workshops was the desire for assistive technologies listed on the platform to be not only visible, but also independently validated for quality, usability, and effectiveness. Participants expressed the need that the products listed on the platform would be validated by end-users and would carry a certification label. In other words, such AT platform should inform only about products that meet certain quality and usability requirements. This could be achieved by having products tested and validated with end-users within Living Lab settings before publishing them on a platform. End-user assessment should follow a standardized methodology, which could be granted by the scientific supervision of the partner universities behind each Living Lab. Indeed, living labs often develop their evaluation methodologies based on technology acceptance frameworks such as UTAUT (e.g., [46]). However, Peek et al.[50] showed that there is generally a lack of standardization in the evaluation of AT, noting that few studies included in their review adopted a technology acceptance framework. Therefore, the adoption of a common AT testing framework could not only benefit older adults but also enhance the quality and comparability of research conducted in living labs.

The data collected in our project shows that around half of the surveyed people would be interested in participating in co-creation and testing activities, which should ensure that such activities can be actually carried out with the target population

4.3 Bridging the Digital Divide Through a Hybrid Platform

Despite increasing digital literacy among older adults in Switzerland, a significant proportion of this population remains offline or struggles with complex technologies [47, 51]. This grey digital device, while gradually narrowing, must be addressed in the design of any platform promoting AT. Ensuring accessibility of an AT platform means creating solutions that are inclusive of those who are not digitally connected. For those people it is essential that information about AT must be available in alternative non-digital formats, for example printed on paper, as advocated by Seifert et al. [52]. Personal advice, e.g., advice in stores, was also mentioned as a possible way of facilitating access. This is another indication that, besides online information, real-world recommendations play a central role. This is also confirmed by previous studies, showing that social support plays an important role in the digital literacy of older adults [53].

To address all those requirements various stakeholders (end-users, municipalities, industry) should work together in managing such a platform in its online and offline form. The involvement of the industry and of local stakeholders is further discussed in Section 5.5.

4.4 Ensuring Inclusive Participation in Co-Design Across Local Cultures

In the context of participatory processes with older people, it should not be forgotten that participation is associated with hurdles. People with a low level of education and income are difficult to reach and there is a risk of excluding their viewpoints [54]. The risk of being excluded from participative processes is also true for fragile older adults [55]. We need to establish a bridge to more fragile senior citizens and older people who are not active in the digital world. Younger, fit senior citizens could serve as a bridge to the more fragile people who should also benefit from assistive technology. This is why real-world, physical alternatives should always exist alongside the digital platform, e.g., by providing information on paper and organizing physical meetings on the topic of ageing technologies at a regional level. These efforts also address the issue of social isolation, help bring offline users on board, and foster dialog between end-users, researchers, and industry. As shown by Pauls et al. [17], the involvement of local multipliers is essential in reaching this target population. Therefore, local senior associations may also play a key role in connecting with vulnerable end-users, especially in rural areas.

Interestingly, we observed differences between language regions regarding the importance of community-building. In the French-speaking region, workshop participants emphasized that the platform should not only provide information but also bring together interested parties, fostering a sense of community. This wish was not raised in the German-speaking regions. In further iterations of the platform co-design and in the future operational activities we plan to involve also Italian-speaking regions to better study cultural differences that may affect the adoption of the platform and of assistive technologies.

Reflecting on the co-design methodologies used in this project, it became apparent that all groups preferred to contribute their ideas to the co-creation process in writing, and that using LEGO serious play as a means of expressing ideas was less accessible to the participants. This shows the importance of responding to the preferences of the participants and to adapt the methods to their needs to make them feel comfortable [56]. Just as it is important when designing products to know the needs of the target group and not to start from the designers' assumptions, it is also important in co-creation processes to adapt the methods to the needs of the participants. Moreover, as noted by Pauls et al.[17], participatory methods should be adapted to ensure the inclusion of hard-to-reach end-users. This includes complementing in-person co-design activities, with remote participation and phone interviews that may facilitate engagement from individuals with health problems or those living in remote areas. This was clearly a limitation of our study: in the short timeframe of the innovation program, it was only possible to engage relatively fit senior citizens that were able to participate in in-person workshops.

Finally, we wish to highlight the ethical dimensions that emerged throughout the co-design process. Several participants expressed discomfort with certain labels and a desire to be approached not as “the older,” but as active individuals with diverse roles and experiences. This concern informed our careful use of terminology across materials and discussions. In line with value-sensitive design principles, we sought to respect

autonomy and avoid stigmatisation by adapting methods to individual preferences and ensuring that participation remained voluntary, inclusive, and empowering. These ethical considerations are not separate from the platform's design but integral to building a trustworthy and meaningful information infrastructure in the field of ageing and care.

4.5 Industry Perspectives and the Challenge of Sustainability

In the survey sent to manufacturers, most respondents came from the security sector, for example, companies developing fall-detection and prevention systems. This narrow response profile suggests a clear convergence of interests between end-users, who seek reliable and easy-to-use safety solutions, and these manufacturers, who are eager to test and certify their products through an independent process. Conversely, the survey revealed that manufacturers showed little enthusiasm for participatory design processes, likely because they had already a product ready for the market and saw a limited added value at their stage of product development.

Industry reluctance to invest in co-design activities raises questions on the financial sustainability of such platform. To remain viable, the platform would require support by various stakeholders (e.g., local communities and organizations, foundations, older adults themselves) and must offer incentives that make participatory processes more attractive to manufacturers. Although product testing activities may be supported through research grants, there is a risk that the platform could not be sustainably operated once these grants expire [18]. One practical solution is to empower local senior associations in key dissemination and organizational activities for conducting tests. This approach could lower the operational costs and foster long-term sustainability.

Additional key stakeholders that may support a platform for assistive technology are government agencies and health insurers. Both should be interested in the results of testing activities, especially regarding technology that is able to reduce fall-related injuries and the related healthcare costs. Currently, Swiss insurers reimburse only emergency call systems and only with a medical prescription. Robust evidence from additional testing could help extend coverage to preventive technologies. Rheumaliga, the Swiss league against rheumatism, based on a study on 741 older adults has already proven that a prevention program based on 12 visits at home of a physiotherapist or occupational therapist is effective in reducing the risk of falls by 24%, reducing especially falls with serious consequences, and the relative healthcare costs generated by such falls psychological [57]. While a cost-benefit analysis for such program was difficult to carry out, Rheumaliga estimated that from a purely financial standpoint (without considering the and emotional consequences of an injury caused by a fall), the program was about cost-neutral [57]. This can be already seen as a success and such costs may be further reduced by adopting assistive technology that may help predict and correct the risk of falls, by analyzing users' behaviors. In this context, testing assistive technologies that may help prevent falls may constitute a high stake for governmental institutions and health insurers.

5 Conclusion

This article presented the participatory design process carried out to identify the needs and determine the characteristics of a platform for promoting assistive technology in Switzerland. The results of this process highlighted the necessity and interest in an independent platform for informing end-users about existing assistive technology. While there was mixed interest in an AT marketplace on such a platform, co-design participants highlighted the importance of trustworthy information and products verified through end-user testing. They expressed a particular interest in gaining more knowledge about security technologies, highlighting that their interest in various assistive technologies varies based on the perceived utility. Participants also highlighted the importance of a hybrid platform, able to spread information not only digitally through the platform website but also physically through local stakeholders, such as senior associations and healthcare professionals.

Companies and other stakeholders recognized the importance of testing assistive technology and validating their benefits to ensure widespread adoption. However, companies appear to be less willing to invest in co-design and testing services. To establish sustainable business models for such platforms, further exploration is required into the potential role of senior associations in supporting and facilitating testing activities. Demonstrating that assistive technologies can contribute to preventive care and reduce healthcare costs could pave the way for financial support from governmental institutions and healthcare insurers, benefiting both the technologies themselves and the platforms that promote their adoption.

The project results highlight that older adults desire to be informed and involved in the development of assistive technologies, but they are often not included by manufacturers due to cost considerations. Furthermore, if a fair flow of information is desired, the information platform should be supported by the government to ensure its sustainability.

Beyond the specific case of Switzerland, this study offers broader insights into the design and implementation of information infrastructures for assistive technology in ageing societies. It demonstrates the importance of adopting a co-design approach not only for the development of technologies, but also for the platforms through which they are communicated and validated. The findings confirm that the mere existence of online tools is insufficient to support adoption among older adults, and that hybrid, socially anchored infrastructures are necessary to ensure reach, trust, and equity. Furthermore, the study highlights that co-design methodologies must be flexibly adapted to local cultures and user preferences—especially when working with populations who may be reluctant to self-identify as “old” or as technology users.

Finally further investigations need to be carried out to assess cross-cultural differences among the different language regions of Switzerland, including also Italian-speaking regions in the co-design activities.

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