AAL/AHA Solution developers / providers

(hardware manufacturers, software/app developers)

PlatformUptake.eu

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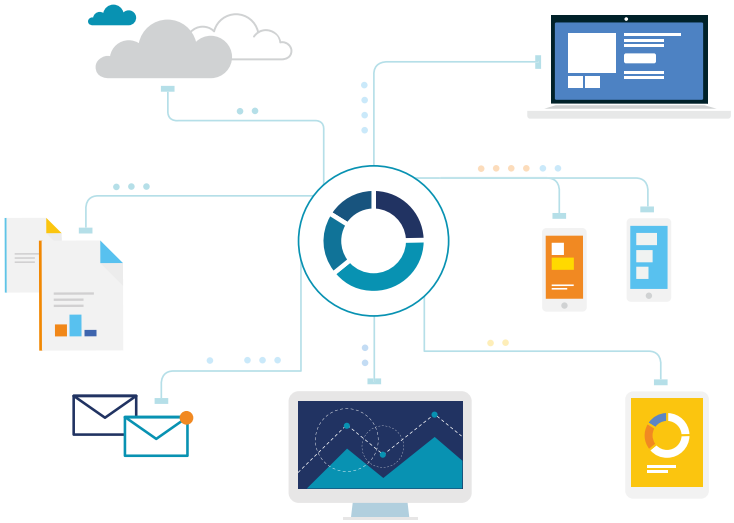
Introduction

Introduction

Scope

Ageing presents one of the greatest socio-economic challenges of our century. The EU has devoted a high level of resources to ICT projects in the field of Active and Healthy Ageing (AHA). As a result, a considerable number of open platforms for the development of innovative solutions in the field have been created. Unfortunately, their impact as well as potential and existing gaps have not been thoroughly analysed and assessed. Some of them are unknown to the wider public in Europe or have even stopped existing.

PlatformUptake.eu responds to this challenge by mapping open platforms in the AHA domain from across Europe and by carrying out an in-depth evaluation of the most representative cases (such as universAAL, FIWARE and AIOTES). The project assesses the hindrance and success factors for their evolution, to finally ensure the large-scale uptake of existing platforms and the development of new ones.



Introduction

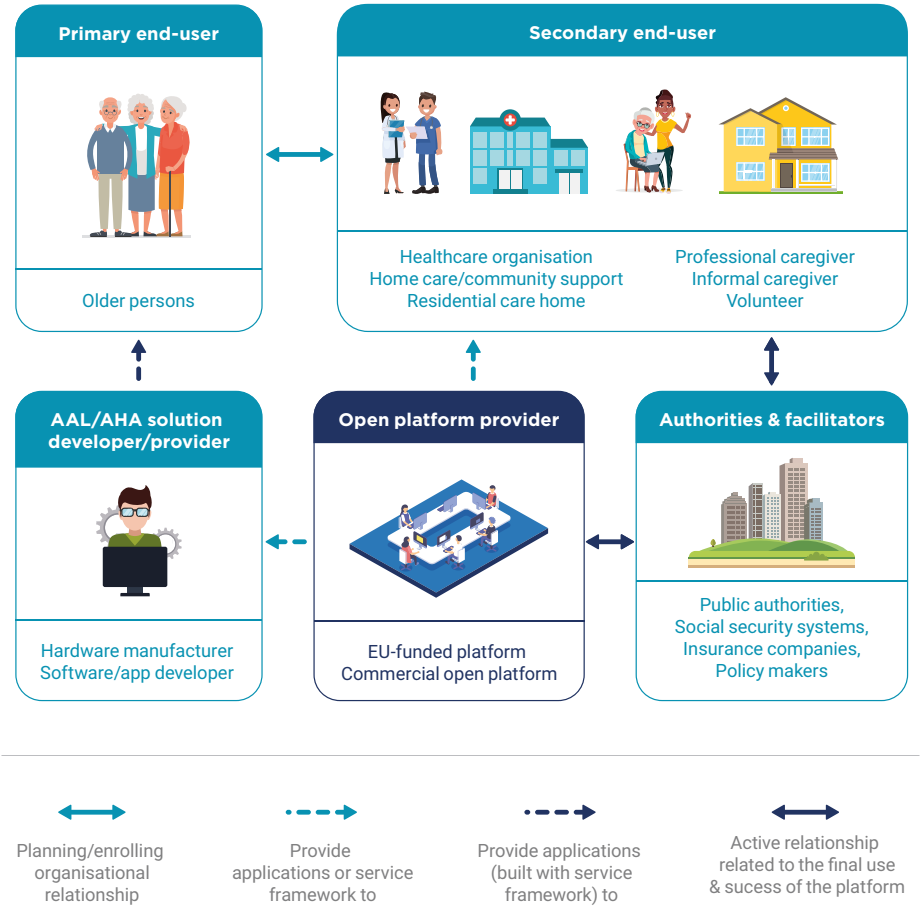
Objectives

The PlatformUptake.eu project is a Coordination and Support Action (CSA), which seeks to understand the whole ecosystem of open platforms in the field and contribute to the development of an open market for digital solutions for active and healthy ageing and ultimately promoting the uptake of open platforms.

To enhance the technical, contextual and business capabilities of existing and future platforms, and thus ultimately contribute to the broad upscale of their services, the project seeks to:

- **IDENTIFY** critical success factors of the development, deployment and spread of open platforms in the Active and Healthy Ageing domain, through a sophisticated tailor-made monitoring methodology.
- **DEVELOP** monitoring and self-evaluation tools to support platform providers and users to self-assess their success, uptake, capability gaps and evolution potentials through smart assessment and visualisation tools.
- **ANALYSE** existing platforms based on the created methodology, by assessing the projects and initiatives hosted by them, their further evolution, uptake, sustainability and socioeconomic benefits.
- **INVOLVE** end-user communities and related stakeholders to initiate a knowledge exchange cycle for collecting insights on best practices and challenges of platforms' uptake, evolution and costs, etc.
- **LEVERAGE** the platform uptake by their user communities as well as their continuous improvement and expansion, by elaborating and showcasing best-practice models and evaluation guidelines.
- **DISSEMINATE** the acquired knowledge to end-users for increasing their uptake of existing platforms, and promote best practice models and identified benefits to foster future developments.

Introduction



This infographic provides an overview of the open platforms' ecosystem in the Active and Healthy Ageing (AHA) and Ambient Assisted Living (AAL) domains, including the platforms' main end-user groups and the interactions between them. These represent the basis for the definition of the recommendations for open platform providers concerning **AAL / AHA solution developers and providers**.

Recommendations

Openness

In AHA and AAL domains, an open platform is a software system that allows the many-to-many substitutability between applications, services and devices from multiple vendors via common APIs for the benefit of an individual user whatever her/his role is (older person, carer, social worker, care worker, governmental representative, technology developers and providers). It is an open digital ecosystem that connects the individual users to health or social care provisions, to lifestyle and prevention applications and home technology to support their independent living, healthy lifestyles and participation in society. Therefore, to make their platforms' services available to third parties such as AAL / AHA solution developers' providers and ease their commercialization, open platform providers need to try to maximize adherence to the principles of: Open Source, Open Standards Based, Federatable, Shared Common Information Models, Vendor and Technology Neutral, Support Open Data, Provide Open APIs, Open Usage and Open Adaptation. Below each of these criteria is elaborated.

- **Open source:** Open Source refers to the availability of the source code of a piece of software in a given programming language with a license in which the copyright holders provide the rights to study, change, and distribute the software to anyone and for any purpose. An open platform does not necessarily mean it is open source [1].
- **Open standards-based:** The implementation should be based on agile open standards. Any willing party should be able to use these standards without charge to build an independent, compliant instance of the complete platform [1].
- **Shared Common Information Models:** There should be a set of common information models in use by all instances of the open platform, independent of any given technical implementation [1].
- **Federatable:** It should be possible to connect any implementation of the open platform to all others that were independently developed, in a federated structure, to allow the sharing of appropriate information and workflows between them [1].

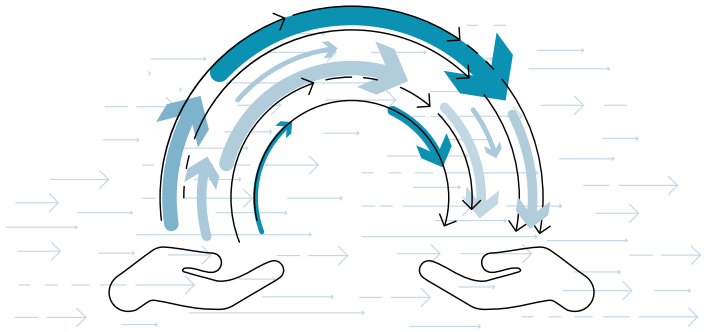
- **Vendor and Technology Neutral:** The standards should not depend on particular technologies or require components from particular vendors. Anyone building an implementation of the open platform may elect to use any available technology and may choose to include or exclude proprietary components [1].

- **Supports Open Data**: Data should be exposed as needed (subject to good information governance practice) in an open, shareable, computable format in near to real-time. Implementors may choose to use this format natively in their persistence (storage) layer of the open platform itself or meet this requirement by using mappings and transformations from some other open or proprietary format [1].

- **Provides Open APIs:** The full specification of the APIs (the means by which applications are connected to the platform) should be freely available [1].

- **Open Usage (adoptability):** Adoptability refers to enabling others to use the open platform while bypassing specific business development negotiations. This does not necessarily mean that the usage has to be royalty-free; it is rather about published, clear, and generally applicable (non-discriminatory) terms and conditions, usually known as the license [2].

- **Open Adaptation:** Assuming that the specifications are publicly available, adaptability of an open platform refers to the possibility of changing existing functionality of the platform itself as opposed to adding new functionality [2].



Recommendations

Number of services provided/developed

Open platforms in the AHA and AAL domains have the ability to connect older persons, care organisations, and providers of technology for active and healthy ageing to facilitate the core interactions between them as well as assure greater efficiency and quality in the provision of care. As such, they are based on innovation, scalability and the relationships within the community around them. Moreover, open platforms represent a collection of applications and services, which are used to support the delivery of care services. This allows the end-user to become a consumer rather than a patient. Not all users of open platforms are patients, as some of them may simply inquire general health information such as diet, exercise, sleeping patterns, or similar information. Additionally, open platforms bring together a broad array of relevant technological resources and help hardware manufacturers and software/app developers connect with the most appropriate services, thus helping these organisations enhance their product offerings and reach out to new customers. This consequently underpins the importance of open platform providers in the community, the scalability of their business, and their important role in the intermediation between supply and demand.

- Involve AAL / AHA solution developers/providers as potential end-users in the design and development of your open platform's services to co-create value and ensure their technology acceptance.
- Establish an attractive value proposition that reflects the bundle of services to create value for a specific segment of AAL / AHA solution developers/providers and stress the competitive advantages of using open platforms.
- Communicate to potential secondary end-users of the applications and services about the competitive edge of your offerings by solving concrete challenges or satisfying concrete needs.
- Demonstrate to potential secondary end-users that by increasing the number of provided services and applications the use of open platforms will become more attractive and successful.

Recommendations

Number of end-users / adopters

The development and deployment of open platforms in the AHA and AAL domains have been the focus of many EU-funded projects and initiatives that have aimed to improve both access to care and quality-of-care delivery. Moving beyond the initial phase of piloting and experimentation, these initiatives are now more clearly focused on the need for effective scaling and integration of open platform services to provide sustainable benefit to all end-users in their ecosystem. To make open platforms attractive to developers of technology for active and healthy ageing, and thus ensure their uptake, organisations need to ensure a large end-user base as a key to unlock the potential for reducing transaction costs, increasing trust among the end-users, and make it more likely for AAL / AHA solution developers/providers to upscale their technology for older people.

- Offer custom-tailored open platform services, as well as training and education to ensure the engagement and loyalty of the end-users.
- Engage with your target end-users regularly to collect information on their level of satisfaction, increase visibility for your open platform's services and enhance your brand's reputation.
- Apply appropriate communication channels (for example through mobile applications, websites, retailers, etc.) to deliver the value proposition of your open platform's services to the specific end-user segments and ensure the growth of your end-user base.
- Establish a communication strategy, which can handle every single interaction with potential ends-users and adopters of your open platform's services.
- Train your employees to provide value at every step in the process of getting new end-users on board. This will make them experience the benefits of your open platform's services from the very beginning.
- Reduce the reliance of your end-users on face-to-face meetings, phone calls or traditional emails.

Recommendations

Compliance/ Adherence to standards

Compliance to standards has a major impact on business performance and the efficiency of open platforms for AHA and AAL. For that purpose and in a significant way, many stakeholders such as care and healthcare organisations, developers of technology for active and healthy ageing and policymakers changed their thinking about standardization effects, especially concerning the emergence and diffusion of digital technology for active and healthy ageing. Moreover, the standards are based on technical elements with a normative value, which set up the parameters for technological design or architecture intended to be implemented by providers of open platforms.As a consequence, open platforms help to reduce transaction costs, enable the establishment of connections and increase the quality of life of older people.

- Carry out a risk assessment to establish if standards, which are currently approved at the international level (i.e. HL7, openEHR, or IHE) will work.
- Choose standards that are already commonly found in your country or target markets. These standards will be most familiar to the hardware manufacturers and software/app developers in the AHA and AAL domains.
- Choose standards that hardware manufacturers and software/app developers in the AHA and AAL domains will accept and support.
- In addition to the international health standards established by recognized standardization organisations, developers of digital technology for active and healthy ageing maintain standards, which facilitate the upscale of their technology. For this reason, it is essential to include organizations from these two groups when developing a deployment strategy.
- Consider bringing use cases forward for validation. It may be valuable for the community to have your platform-specific workflows and design standardized. Hence, you will contribute to international standards work.

Recommendations

Software documentation

Software documentation is a part of any open platform. Good documentation practices are important for the success of the platform. They also help hardware manufacturers and software/app developers make effective use of open platform software. In general, documentation solves issues encountered by the technology developer during the development process, and it helps the end-user understand the product. It also assists the support team in finding the information.

- Provision of how-to guides to the user of the platform's services to complete a task or a predetermined goal.
- Establishment of tutorials, which will help end-users build an understanding of the open platform's concept by following a series of steps.
- Creation of reference documents to describe in detail the software requirements specification, software design documents, etc.
- Provision of an administration guide to support the administrator in the installation and maintenance of the open platform's applications and services.

Recommendations

Technical efficiency

Open platforms help connect data on the health status and the living environment of older persons stemming from various devices with applications that enable their processing for the scopes and the benefit of the involved stakeholders. In this context, they aid bring together hardware manufacturers and software/app developers and the implementation of new upscale strategies for their products. Hence, the incorporation of platforms into organizations and processes is a vital step towards improving health resources and efficiency in care delivery, while promoting digital innovation along the value chain. Their role as an orchestrator of transactions between supply and demand is a core mechanism, which creates value for all stakeholders involved in the ecosystem. However, how technically efficient the platforms are, can impact the promised low transaction costs and hinder the entrepreneurial innovation process.

- Enable AAL / AHA solution developers / providers to 'plug and play' with the services of the open platform, so they can easily create solutions on the top of it.
- Apply a modular approach and separate the frontend from the backend of the open platform to improve efficiency. This will also allow identifying specific areas from the platform that can be transformed to quickly realize most benefits.
- Ensure the appropriate number of installation instances of the platform to allow for its easy configuration.
- Offer training to the end-users with contextual guidance and personalized support to allow them to master the platform's technology and services at their disposal.

Recommendations

Integration level

Open platforms software allows AAL / AHA solution developers / providers to develop faster solutions that can include applications and devices. Hence, they get a better starting position compared to competitors, which consequently lets them gain a substantial market share. Moreover, against the background of the dynamics in the two-sided markets, this can create a competitive advantage and make it hard to catch up for other organisations.

- Allow different end-users to access the platform by providing applications for multiple sub-ecosystems.
- Provide to developers the possibility to choose the desired level of integration of their applications with the platform. This can include functions like authentification (e.g. verification, fingerprint) which can be used by AAL / AHA solution developers / providers for their solutions.
- Offer storage, retrieval and synchronisation features for data in your platform to allow the reuse of data and customization of solutions to the older people's needs.
- Design the endpoints (APIs) as a primary element for technical integration according to developers' needs. This will increase the efficiency in application realization, which will consequently induce them to use the services of your open platform.
- The "openness" of your platform represents a major characteristic of its design and facilitates also the integration of third-party technologies. The specifications of its openness, such as among others open APIs, open standards-based, vendor and technology-neutral, etc., ease the application integration.

Recommendations

Robustness

As a complex system with open characteristics, the open platforms are often subject to failures and attacks, and their end-users are often in a state of frequent change or even mass loss. In this context, the robustness of open platforms can be defined as the degree to which their components can operate correctly in the presence of invalid inputs or stressful environmental conditions. With their increasing complexity and widespread use, obtaining assurances regarding their robustness has become of vital importance.

- Implement proper techniques for checking and validating of any inputs, which are supplied by the end-users of your platforms' services.
- Establish good endpoint protection technologies/mechanisms, such as real-time detection, pattern-recognition or prediction, to protect your open platform against data corruption and malicious behavior.
- Apply mechanisms to detect overload, which can shed traffic from within the platform's processing chain. This will allow the platform's services to recover and prevent the re-appearance of overload.
- Consider using a cloud-based system to ensure the permanent availability of your data, software, servers, etc., in cases of system failure. Cloud-based systems provide can also maximise the scalability of your platform and allow you to save costs and make the management of its services easier.

Recommendations

Minimum fixed costs

Based on their technical and business aspects, open platforms in the AHA and AAL domains have become global players with millions of end-users. This phenomenon relates, among others, to the low fixed costs of processing, storing, replicating and transmitting data for additional end-users. Hence, new developers of technology for active and healthy ageing, including hardware manufacturers and software/app developers, can enter a niche market rapidly and unlock cost efficiency via the platform's self-reinforcing network effects. For open platform providers this is, in turn, a pre-requisite for their solutions to remain competitive.

- Provide a clear overview to the AAL / AHA solution developers/providers of the costs for the use of the platform's services (e.g., software, installation and configuration of the services).
- Offer flexible subscription models, depending on the actual use, size of the organisations, consumption of the services, etc.
- Enable "multi-homing" to avoid lock-in for the subscribed end-users, decrease their costs for data transfer and increase the competitiveness of your platform.

References

[1] Apperta Foundation (2022), Defining an Open Platform, https://apperta.org/assets/Apperta_Defining_an_Open_Platform_April.pdf

[2] universAAL (2016), What is an „open platform", https://www.universaal.info/blog/post/3487/What-is-anopen-platform/

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and learn about open platforms in the AHA domain, upscale your digital solutions for older people and improve the quality of care provision to your patients and citizens.

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