Executive Digest

SHAFE approach implementation for Digital Health Solutions

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Relevance of this topic to Digital Health

In November 2017, the European Commission launched a call for proposals on strategic initiatives for a Thematic Network and the most voted proposal in the European Union Health Policy Platform was under the theme *Smart Healthy Age-Friendly Environments* (SHAFE)[1]. In 2018, SHAFE was approved as a Thematic Network by the European Commission and to date is part of several ongoing initiatives and different networks for age-related themes (e. g. the Action Plan of Group D4 of the European Innovation Partnership on Active and Healthy Ageing[2]). It is also aligned with the EU Health Priorities that aim to increase quality, innovation and sustainability for the implementation of better health and care systems, according also with the objectives of the Blueprint and Communication on Digital Transformation of Health and Care[3].

SHAFE has its roots on the holistic concept of age-friendly environments, developed by the WHO in 2007, but today significantly integrated into the new era of digitalization and health[4]. In fact, the concept combines built environments (housing, public spaces and buildings) with information and communication technology (ICT) applications, in order to create healthy and friendly environments that enable independent living, better participation in society and wellbeing through the user-centred design, in which the Person is the core of the whole process of digitalization.

The specific aim of SHAFE is to enhance the two main aspects of Age-Friendly Environments – People (e.g. citizenship, life-long learning, social interaction in relation to their functional ability) and Places (e.g. houses, built environments, community spaces and outdoor facilities) – in the creation of eHealth and mHealth solutions especially focused on quality and costs[5].

Regarding eHealth, special emphasis was given to its current state of the art in Europe e-support of smart homes to patients suffering from chronic diseases and impairments such as robotics, smart living environments and smart communication integrated and connected with formal and informal care. These smart environments need to align technology development with the building industry in terms of policy and funding in order to make smart homes available, affordable and large-scaled in Europe. With regard to mHealth, the focus has been on understanding and overcoming the major gaps between technological development and the real needs and expectations of users, and proposing policy measures that would facilitate and improve the market entry of new products in the hope of reducing inequalities in access to health services[3].

In this framework, the built environment design of indoor and outdoor living spaces plays a central role, because it is the physical context in which human activities take place. SHAFE's paradigm shift lies in a life-course approach, based on both the design of healthy, accessible, adaptive, flexible living environments, and on the provision of digital support solutions (ICT), promoting people's autonomy and independence throughout the life course. For example, enabling people to benefit from safe environments that support health and well-being and help prevent disease, such as accessible and age-friendly housing equipped with digital support solutions (ICT), safe transportation, accessible outdoor spaces to promote physical activity and social participation, and adaptable shared care models in the European context[6].

Keywords

Active and Healthy Ageing, Age-friendly Environments, Design Inclusion and Accessibility, SHAFE, Healthy environments, Smart environments

[1] Dantas, C., van Staalduinen, W., Jegundo, A.L., Ganzarain, J., Van der Mark, M., Rodrigues, F., Illario, M., De Luca, V., Smart Healthy Age-Friendly Environments – Policy Recommendations of the Thematic Network SHAFE, Transl Med UniSa, 19, pp.103-108, (2019), PMID: 31360674; PMCID: PMC6581501.

[2] Dantas, C., van Staalduinen, W., Illario, M., Spiru, L., Smart and inclusive environments for all SHAFE explained. Technium Social Sciences Journal, Vol. 25. Plus Communication Consulting srl, (2021), ISSN: 2668-7798, DOI: 10.47577/tssj.v25i1.4844.

[3] Dantas, C., van Staalduinen, W., van der Mark, M., Jegundo, A.L., Ganzarain, J., Framing Paper Thematic Network 2018 Smart Healthy Age-Friendly Environments, Coimbra and Gouda, (2018).

[4] Memorandum of Understanding for the implementation of the COST Action "International Interdisciplinary Network on Smart Healthy Age-Friendly Environments" (NET4AGE-FRIENDLY) CA19136, (2020).

[5] Dantas, C., van Staalduinen, W., Smart Healthy Age-Friendly Environments (SHAFE) Position Paper, (2020), https://en.caritascoimbra.pt/wp-content/uploads/sites/3/2020/10/SHAFE-Position-Paper-011020.pdf

[6] Van Staalduinen, W., Ganzarain, J.G., Dantas, C., Rodriguez, F., Stiehr, K., Schulze, J., Fernandez-Rivera, C., Kelly, P., McGrory, J., Pritchard, C., Berry, D., Zallio, M., Ciesla, A., Ulanicka, M., Renaux, S., Guzy, M., Learning to implement Smart Healthy Age-Friendly Environments. Transl Med UniSa, 23, pp. 1-5, (2020), DOI: DOI: 10.37825/2239-9747.1021, PMID: 34447703, PMCID: PMC.

Current focus of policy, legislation, standards, emerging practices in this landscape

The International Interdisciplinary Network on health and wellbeing in an age-friendly digital world - NET4Age-Friendly - is the Cost Action 19136 (https://www.net4age.eu/)[7], whose aim is to develop an international and pan-European ecosystem composed of the quadruple helix (citizens, public authorities, businesses/NGOs, researchers) that enables the practice and deployment of Smart Healthy Age-Friendly Environments (https://shafe.eu/)[8], paying special attention to COST Inclusiveness Target Countries (ITC).

NET4Age-Friendly ecosystem is supported by four thematic Working Groups: User-centered inclusive design in age-friendly environments and communities (WG1); Integrated health and well-being pathways (WG2); Digital solutions and large-scale sustainable implementation (WG3); Policy development, funding forecast and cost-benefit evaluations (WG4). Their outcomes flow into the work of a fifth one (WG5), the Reference Framework, as a synergistic output. According to the Memorandum of Understanding for the implementation of the COST Action 19136, the areas of expertise engaged are Health Sciences (Public and Environmental Health), Computer and Information Sciences (Artificial Intelligence, Intelligence Systems, Multi Agent Systems) and Environmental Engineering (Environmental and Geological Engineering).

In order to ensure the impact and quality of the Action, the Management Committee and all experts involved in NET4Age-Friendly established the following Research Coordination Objectives (RCO) to be achieved:

- RCO1: To synthesise and improve existing knowledge from local, regional, national and international settings, disciplinary disparate dialogues in order to share a coherent scientific overview and dialogue for the design of SHAFE and integrated care pathways (WG1, WG2).

- RCO2: To critically investigate the creation of innovative solutions of digital health that promote success and break down barriers, ensuring climate neutral and sustainable development and broad implementation of SHAFE (WG3).

- RCO3: To assess the impacts of SHAFE across the life course within economic, social service, civil rights, political, environmental, and social spatial domains (WG4).

- RC04: To envision a user-friendly, inclusive conceptual framework for SHAFE for a practical application in understanding the benefit of ICT for age-friendly design within cities, rural communities, neighbourhoods, buildings at European level (WG5).

- RCO5: To ensure innovative, flexible, implementable, policy and practice exploitation through dissemination, networking and ecosystem strengthening across disciplines all over Europe and beyond (WG4).

Remaining gaps and issues

The SHAFE approach has made significant progress in fostering innovation through co-creation, living environment initiatives, and digital skills training aimed at enhancing the citizens' lives in the health and well-being domain. Despite these efforts, realizing the full potential of SHAFE remains a challenge because of its holistic approach, which requires extensive dialogue and consultation among different stakeholders.
The WHO has long recognized the importance of evidence-informed approaches to policymakers to improve effectiveness, efficiency, and equity but integrating such approaches into our innovation ecosystems remains a distant goal.

An important gap to highlight is the lack of a categorization of environmental monitoring technologies (e.g. home monitoring systems thanks to the use of home automation and the IoT) into the second edition of "Classification of digital interventions services and applications in health: A shared language to describe the uses of digital technology for health"[9]. Strategies to adapt the built environment to meet the evolving needs of individuals and changing challenges of communities (e.g. pandemic and climate proof environments) must be accelerated by the construction and housing sectors also towards the concept of smart homes to collect information from the domestic environment in which the older adult live and the clinical parameters, analysing the data generated by the motion sensors installed in different rooms of the house and the medical devices. Concurrently, health and well-being sectors must enhance their digital skills and adopt a

comprehensive, person-centred approach to care. As well as citizen empowerment through digital skills and accessibility is crucial for this transformation.
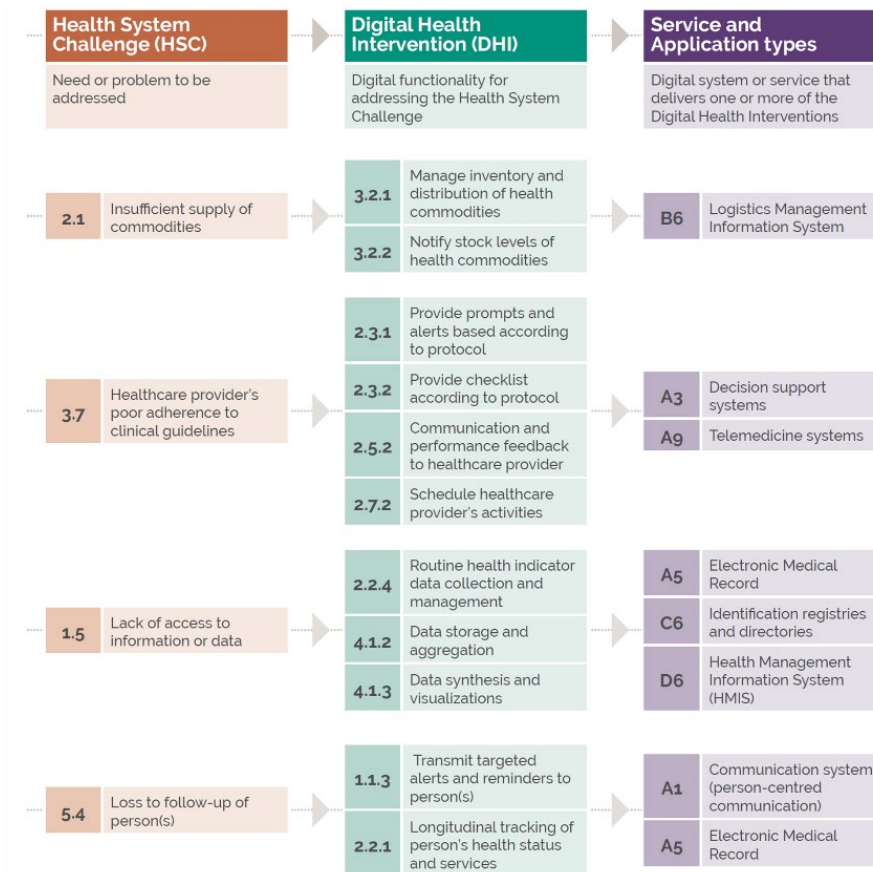

Figure 1. Linkages across Health System Challenges, Digital Health Interventions, and Services & Application types (WHO, 2023)
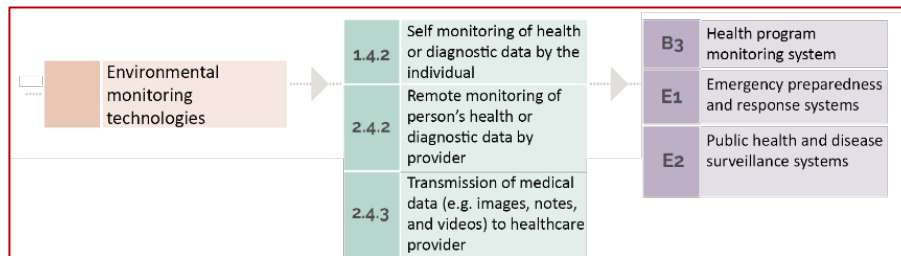

Figure 2. Example for environmental monitoring technologies

Addressing these challenges requires a concerted effort and the SHAFE approach requires important support from solid evidence. This evidence should be derived from innovative methods and solutions focused on disease prevention, health promotion and integrated health, so that such data could enable effective measurement of SHAFE's impact.

Legislative, regulatory, policy or standardisation instrument, or good practice
Title
Hands-on SHAFE
Instrument status
The Erasmus+ project started in September 2019 and runs until December 2022
Publisher or source
The European Commission
URL or reference
https://hands-on-shafe.eu/en
Summary of the instrument

"Hands-on training and tools on smart healthy age-friendly environments (Hands-on SHAFE)" is an Erasmus + project coordinated by AFEdemy and focuses on 4 main building blocks: SMART, HEALTHY, BUILT and BUSINESS.

The project support independent living, active lifestyle and participation in society for every citizen, no matter if someone is young or old, handicapped or healthy, rich or poor. To provide easily accessible tools to actually realise SHAFE, AFEdemy initiated the Hands-on SHAFE project, whose aim is to deliver informal learning experiences and hands-on tools to implement SMART and HEALTHY BUILT environments or to develop BUSINESS in this area. The learning experiences aim to enable facilitators (volunteers, formal and informal caregivers) to create smart healthy age-friendly environments for themselves, their parents, neighbours or friends.

The objectives of the Erasmus+ Hands-on SHAFE project are:

- The improvement of the smart, physical and social environments at local level to foster social inclusion for all;
- The improved empowerment of people with low skills or low qualifications who work at local level or act as volunteer for their parents, family or neighbourhoods;
- The increase of opportunities for them to become a social entrepreneur.

Project partners:

- (Coordinator) AFEdemy: Willeke van Staalduinen and Javier Ganzarain
- Cáritas Diocesana de Coimbra: Carina Dantas and Flávia Rodrigues
- ISIS Institut für Soziale Infrastruktur gGmbH: Karin Stiehr and Jesper Schulze
- TU Dublin: Damon Berry, John McGregory, Paula Kelly, Matteo Zallio and Charlie Pritchard
- Politechnika Warszawa: Agnieszka Ciesla and Marianna Ulanicka
- Airelle Corrèze: Miriam Guzy and Sonny Renaux

Associated partners:

- AGE Platform Europe
- An Siol Community Development Project Cabra Dublin
- Autonom'lab
- Covenant on Demographic Change
- ECHAlliance
- Enable Ireland
- Giunta Regionale della Campania Italy
- Hamburg Ministry of Health and Consumer Protection, Germany
- International Society for Telemedicine & eHealth
- Seniors Initiatives Centre Kaunas
- Tecnalia
- LILT Associazione Provinciale di Biella – ONLUS
- Municipality of The Hague
- Ordem dos Engenheiros Região Centro
- Faculdade de Medicina – Universidade de Coimbra
- Instituto de Sistema e Robótica – Universidade de Coimbra
- Nursing School of Coimbra
- Instituto Pedro Nunes
- City of Warsaw

Implication for digital health stakeholders

Patients/Caregivers

- Support for autonomy and everyday tasks;
- Promotion of social participation and integration;
- Assistance in living a healthy life and preventing diseases;
- Medical care in rural areas.

Healthcare providers (nurses, doctors, etc.)

- Person-centred healthcare assistance;
- Person-centred health data collection.

Healthcare system management

- Reduction of the workload of the health care system;
- Reduction of multiple treatments and better coordination of therapies.

Health policymakers

- Considerable cost savings by creating uniform IT systems, diagnostic and administrative software.

Legislative, regulatory, policy or standardisation instrument, or good practice
Title
AFECO
Instrument status
The Erasmus+ project started in December 2022 and runs until May 2025
Publisher or source
The European Commission
URL or reference
https://afeco.eu/
Summary of the instrument

The core idea of the AFECO proposal is to empower older adults to apply affordable age-friendly and eco-friendly solutions in their own living environments to foster their participation in society, quality of life and prolonged independent living. The World Health Organization (WHO) developed in 2007 the concept of age-friendly environments, which embeds the concepts of age-friendly buildings, neighbourhoods, cities and communities. The concept makes use of a holistic approach to optimise social and physical (indoor and outdoor) environments as well as defining supportive provisions (such as meeting opportunities, public communication, healthcare and services) to improve social inclusion, independent living, equity, and enable active and healthy participation in society. Social inclusion in AFECO entails people with health issues, chronic diseases, disabilities, or people who face social and financial barriers. Our project will take on a multifaceted approach to social inclusion, within the context of the WHO concept of age-friendly environments, supported by the digital transformation that takes place in The Netherlands and in Europe since the launch of the WHO concept.

The main objective of the AFECO proposal is to develop a well-structured and open e-learning platform aiming to raise awareness and educate older people, (in)formal caregivers and social workers regarding:

- The application of age-friendly principles (in-home and in neighbourhood) as a valuable tool for active ageing and ageing in place. Age-friendly environments can play a crucial role in empowering citizens to:
  - Age in better physical and mental health;
  - Actively participate in society;
  - Stay independent and in better health for as much as possible.

- The cultural and behavioural shift needed for the promotion of age-friendly environment principles through their interaction with environmentally friendly (eco-friendly) principles;
- The new configuration and challenges posed on age- and eco-friendly physical environments under the continuous advance technological application and assisted living systems for ageing in place.

The role of age-friendly and eco-friendly environments (home and community/neighbourhood) as a valuable tool in the caregiving context that can compensate for the biological decline in case of frailty or disease of older people in need of care.

Project coordinator:

- AFEDEMY, ACADEMY ON AGE-FRIENDLY ENVIRONMENTS IN EUROPE BV (The Netherlands)

Project partners:

- Corporation for Succor and Care of Elderly and Disabled-FRODIZO (Greece)
- ISTITUTO PER SERVIZI DI RICOVERO E ASSISTENZA AGLI ANZIANI (Italy)
- ISIS Institut für Soziale Infrastruktur gemeinnützige GmbH (Germany)
- SHINE 2EUROPE, LDA (Portugal)
- STICHTING HOGER BEROEPSONDER WIJS HAAGLANDEN (The Netherlands)
- UNIWERSYTET PRZYRODNICZY WE WROCLAWIU (Poland)

Implication for digital health stakeholders

Patients/Caregivers

- Support for autonomy and everyday tasks;
- Promotion of social participation and integration;
- Housing adaptation services for older adults provided by local authorities;
- Assisted living systems for ageing in place.

Healthcare providers (nurses, doctors, etc.)

- Person-centred healthcare assistance;
- Person-centred health data collection.

Health system management

- Reduction of the workload of the health care system;
- Reduction of multiple treatments and better coordination of therapies.

Health policymakers

- Considerable cost savings by creating uniform IT systems, diagnostic and administrative software.