4ᵗʰ International Conference on Environmental Design, ICED2023

Session: Urban and Open Areas I
Room A : 10:45-12:15. 22.10.2023

Environmental design for SHAFE approach

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BACKGROUND

- "Need to ensure age-friendly environments to foster active and healthy ageing because the number of people over 60 is set to double by 2050."

WORLD
REPORT
ON
**AGEING
AND
HEALTH**
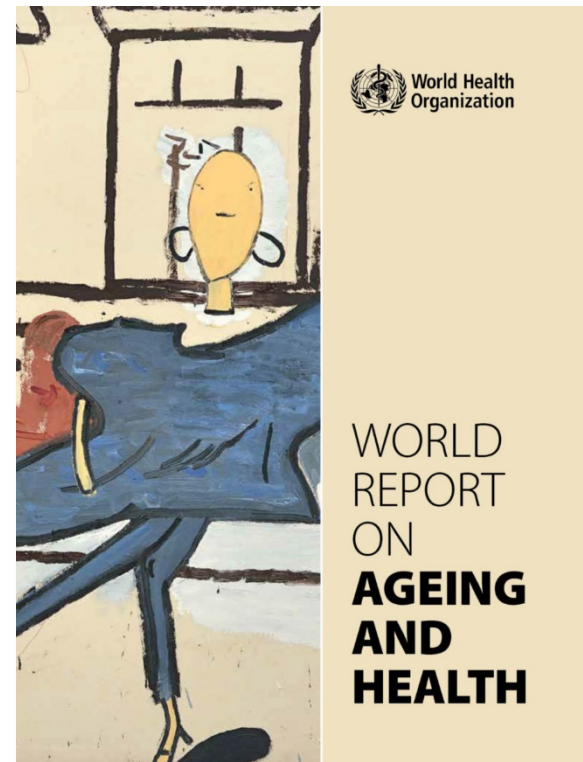
(WHO, 2015)

BACKGROUND

● The Decade's four Action Areas are:

o Changing how we think, feel and act towards age and ageing;
o Developing communities in ways that foster the abilities of older people;
o Delivering person-centered integrated care and primary health services responsive to older people;
o Providing older people access to long-term care if they need it.
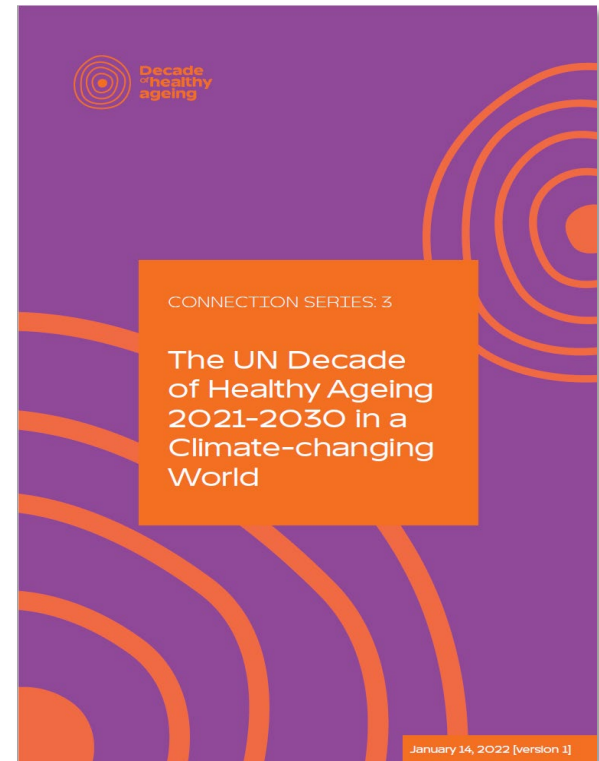
(WHO, 2022)

AIM OF THE STUDY

- Overview the scientific literature on existing studies, approaches and applications for the design of living spaces truly responsive to people's changing needs in the long-life perspective, in particular, to the specific needs of the elderly;

- Examine the role of the environmental design to enhance the SHAFE (Smart, Healthy, Age-Friendly Environments) approach to architecture, which supports health, independence and autonomy of people in the long term.

CONCEPTUAL FRAMEWORK

Trajectories for ageing in place

Create age-friendly environments, cities and communities

Support health services, long-term care, transport, housing, outdoor spaced and buildings, energy efficiency, information and communication technologies (ICT)

(WHO, 2018)

CONCEPTUAL FRAMEWORK

● Smart technologies for ageing in place

The construction sector investigates the key role of ICT in the management of space, both physical and virtual to support innovative housing models (Trane *et al.*, 2022)

Technologies can enhance personal safety, health monitoring, living environment control, improving social interaction for older adults living independently (Kwok *et al.*, 2016)

CONCEPTUAL FRAMEWORK

● Built environment: Behavioural and Psychological determinants

The reconstruction of the building structure and the rearrangement of the layout for a building functional improvement to increase usability and safety, now also provides smart technology devices (Chuan *et al.*, 2021)

Enjoyable experiences in intelligent surroundings can enable the elderly to live independently and improve their well-being (Mnea *et al.,* 2023; Shon *et al.*, 2020)

CONCEPTUAL FRAMEWORK

● SHAFE model and built environment

SHAFE (Smart, Healthy, Age-Friendly Environments) has been proposed as an innovative design approach to face the challenge of ageing, approved by the European Commission.
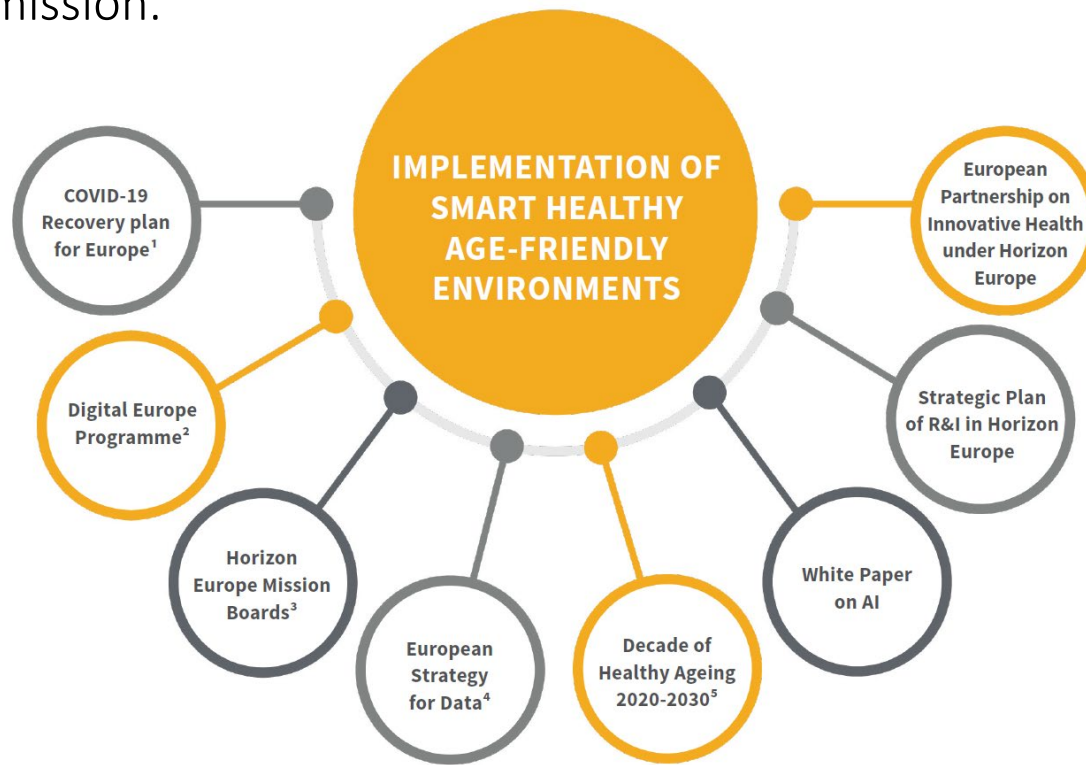
(SHAFE Position Paper, 2020)

CONCEPTUAL FRAMEWORK

SHAFE model and built environment

GOALS

o Promotion of smart and inclusive solutions to improve the independent life throughout the life course, regardless of age, gender, disabilities, cultural differences and personal choices;

o Optimization of social and physical environments, supported by digital tools and services.

(SHAFE Position Paper, 2020)

CONCEPTUAL FRAMEWORK

- SHAFE model and built environment

NET4Age-Friendly is the most recent application of SHAFE model aimed to establish an international and interdisciplinary network of researchers from all sectors to support the creation of smart, healthy, indoor and outdoor environments for presents and future generations.

5 WORKING GROUPS:

WG1 WG2 WG3 WG4 WG5

User-centred inclusive design of age-friendly environments and communities
Synthesis of existing knowledge and critical assessment of inclusive design practices and innovative SHAFE solutions

(Cost Action 19136, International Interdisciplinary Network on Smart Healthy Age-friendly Environments)

RESEARCH METHOD

● The study is based on three steps:

I. Literature research:

   o Innovative architectural methods and solutions for the design of living spaces suitable for ageing in place

Keywords: Active and Healthy Ageing; Age-Friendly Housing; Inclusive Interior Design; Built Environment; Smart Technologies for Ageing in place; SHAFE.

Databases: Google Scholar; ScienceDirect; PubMed.

RESEARCH METHOD

II. Inclusion and Exclusion Criteria

o **Studies included**: latest and most innovative design solutions to ensure living environments for active and healthy ageing, promoting the design both for the layout of the domestic environments and for the modifications that can be applied. User-centered inclusive design studies and functional-spatial aspects for resilient environments and assistive technologies.

o **Studies excluded:** medical or biological studies.

RESEARCH METHOD

III. Studies selection

- o 2 reports
- o 29 scientific articles
- o 6 systematic reviews
- o 1 thematic review
- o 2 critical reviews

The systematic reviews contains links to a further 50 studies, making a total of 90 studies consulted.

RESULTS

The scientific literature reports on the adoption of smart technologies related to the home modification process, in terms of built environment for ageing in place. Usability is the fundamental aspect for smart devices in the homes for older people, in which the user interface should be reliable, user-friendly and suitable for everyday use.

Two levels of invasiveness of the smart home modification process were found:

1. Low level, consisting in devices placed on the surface of architectural components or installed inside the infrastructure and furniture (e.g. climate sensors on walls or ceilings, pressure sensors under mattresses, water meters on taps, contact sensors on doors);

2. High level, structural technologies retrofitting the existing housing structure for some specific purposes (e.g. fall detection floor to replace slippery floor tiles in risky areas).

RESULTS

The classification of smart technologies used in the home environment
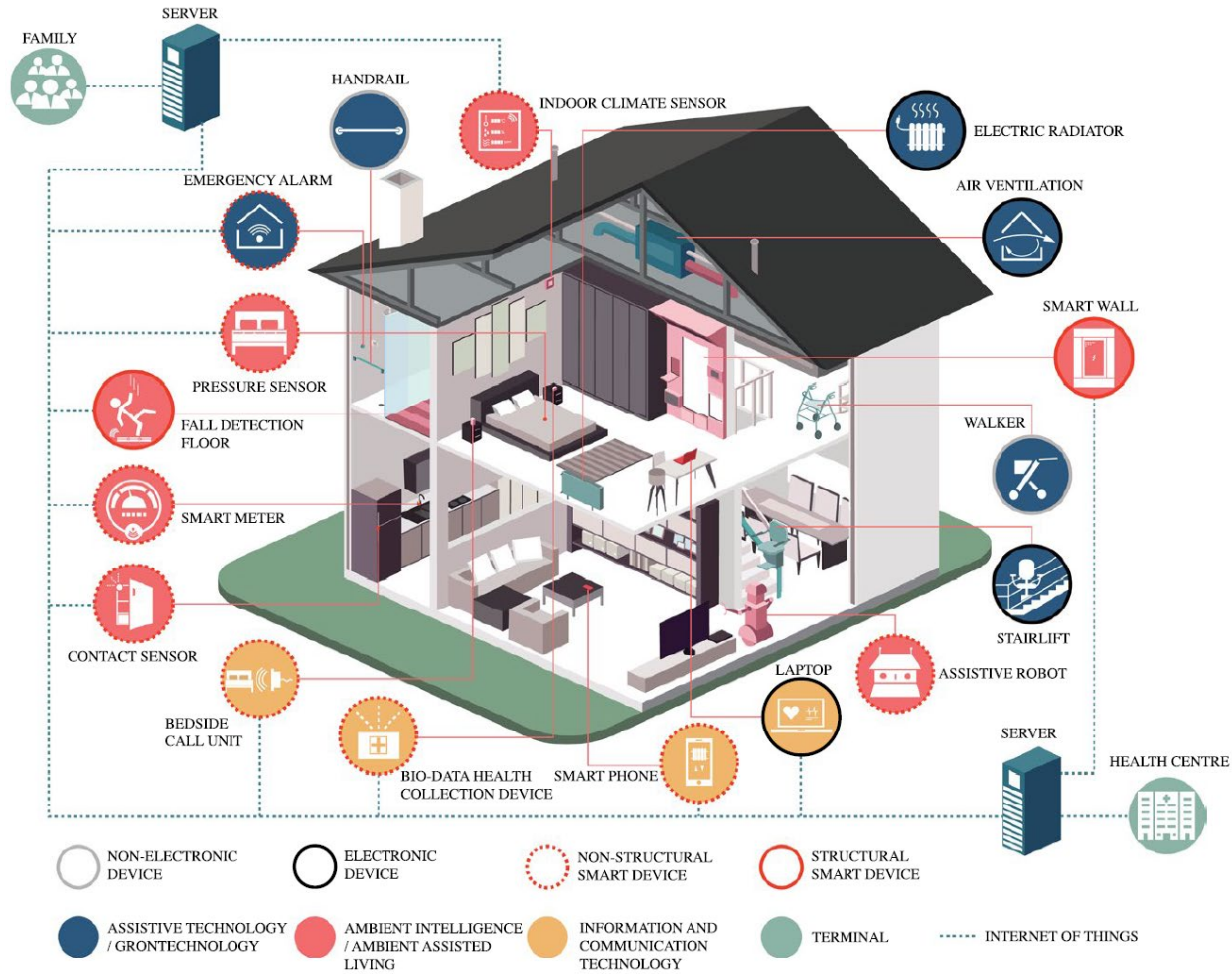
(Chuan *et al.*, 2021)

CONCLUSIONS

● Home modification process is linked to the design of smart age-friendly environments
but applied researches in real-life projects need to be explored

● Usability of smart technologies by the elderly population is crucial
but design guidelines for the use of smart technologies in living spaces by elderly population are still lacking

● Environmental design can improve accessibility, adaptivity, flexibility and sustainability of living spaces
but design principles considering the elderly occupants need to be further investigated

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THANKS FOR YOUR ATTENTION

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