NET 4 Age-Friendly

Module
User-Centered Design (UCD) in Smart, Healthy, Age-Friendly Environments (SHAFE)

Working Group 1

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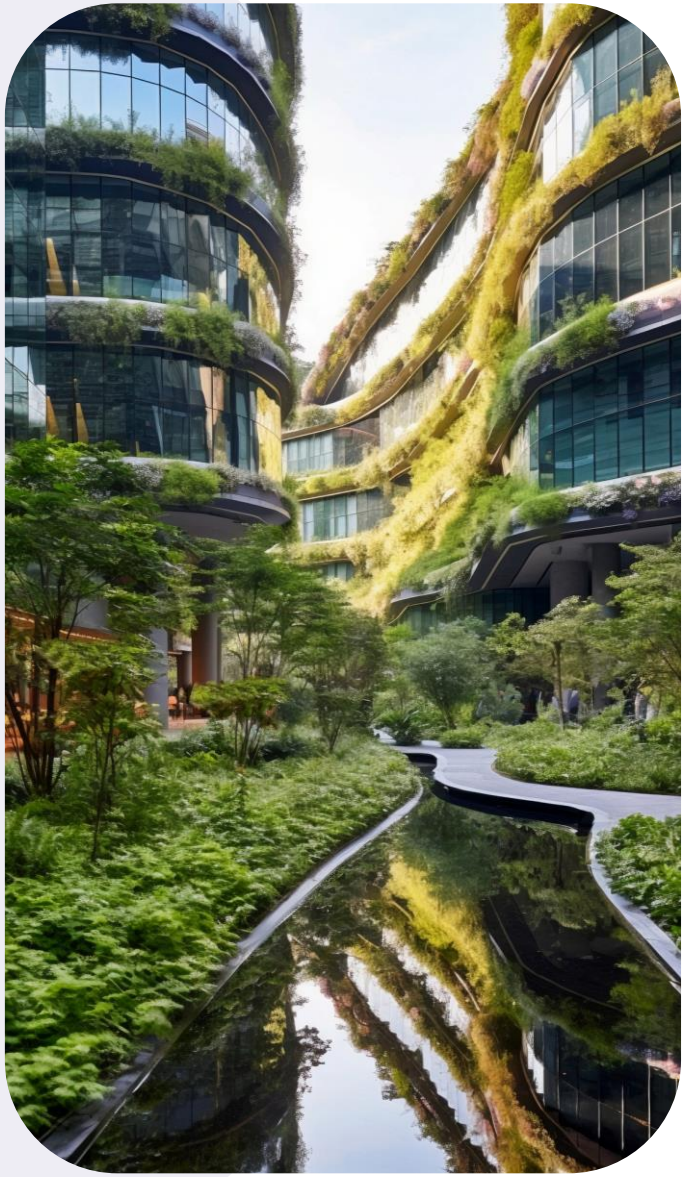

INTRO

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D6 - Final report on user-centred design of SHAFE

The main goal objective of this document is to present a summary of the existing knowledge and a critical assessment of practices in inclusive design of innovative solutions for the implementation of Smart Healthy Age-Friendly Environments (SHAFE), as well as recommendations for the future.

In this document, the process of creation, development and mapping of the Matrix to synthesize existing knowledge and critically assess practices of inclusive design of innovative solutions for SHAFE is detailed.

https://www.net4age.eu/d6-final-report-user-centred-design-shafe

INTRO

White Paper: Designing the perfect NEB neighbourhood

The New European Bauhaus initiative gathers “beautiful, sustainable, and inclusive projects and ideas” to inspire a positive transformation around us. The New European Bauhaus 2024 Festival took place between 9-13 April. “Designing the perfect New European Bauhaus neighbourhood: New European Bauhaus meets SHAFE” was a Satellite Event of the Festival, held as an online workshop, organised by the SHAFE Foundation on April 9th, 2024. At the event, a group of 50 participants with a multidisciplinary background discussed how to meet the challenges of the European Garcia family to enable them to live in a perfect neighbourhood.

The White Paper presents the findings of the participants with the New European Bauhaus inspiring projects and ideas to house the European Garcia family in their neighbourhood. The White Paper recommends developers, designers, planners, and policymakers to include person-centred design of social and physical environments and technologies. Although awareness of person-centred design is growing, many initiatives still hamper the inclusion of citizens or end-users throughout the development of products and services.

https://zenodo.org/records/11212838

USER-CENTRED DESIGN (UCD)

The UCD approach ensures that **users are involved in the design process of solutions** (e.g. products, tools, services and/or software) from start to finish.

By focusing on inclusion, accessibility, usability and engagement, we can create solutions that cater to the diverse needs of our communities and our society in different contexts.

In the field of Smart, Healthy, Age-Friendly Environments (SHAFE), user-centred design is crucial.

It **supports users regardless of age, gender, disabilities or cultural differences with solutions that optimise both social and physical environments**, leveraging digital tools and services to provide better health and social care.

Aligned with the **United Nations' Sustainable Development Goals**, the SHAFE approach promotes sustainable environments for all ages, ensuring a better future for everyone. We can create communities of belonging through fostering partnerships between technology, architecture, urban planning and health sciences to address the challenges of various sectors, These communities promote the dignity of all individuals, regardless of their background or circumstances and pave the way for a healthier, more inclusive society.

This enables the possibility to **work together to build a future where everyone can learn, grow, work, socialise and enjoy a healthy life**, benefiting from digital and social innovations and adaptable support models.

SOCIETAL CHALLENGE

Why is USER-CENTRED DESIGN (UCD) important?

- It is necessary to understand needs of the potential users. Although there are standards and norms in various domains, they might not be properly addressed and integrated in the concrete solutions.
- It requires more intensive training of solution providers to communicate with potential users to understand their requirements correctly.
- It promotes the development of guidelines with best practice examples.
- Focusing the design process of spaces on users is necessary to respond to their changing needs, always having user safety and security in mind.
- It fosters indoor and outdoor design of environments that must be flexible and adaptable over time.

SOCIETAL CHALLENGE

MUST DOs in USER CENTRED DESIGN:

Thorough analysis of emerging technologies from the users´ point of view. Frequently the development is focusing only on proper function but not on user acceptance.
Use research methods such as interviews and surveys to get as much information as possible about the current state of the project and how it solves users' problems.

EXAMPLES OF UCD APPLICATIONS:

- Inner layout of buildings
- Design of user interfaces and functionalities of software
- Usability of architectural spaces
- Design of various tools needed in everyday life

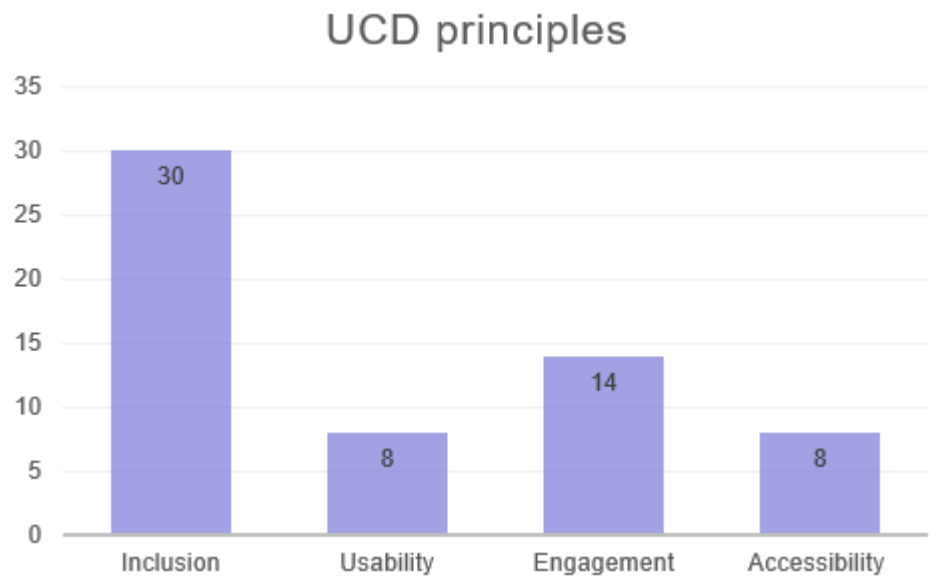
MAIN FINDINGS

MAIN FINDINGS

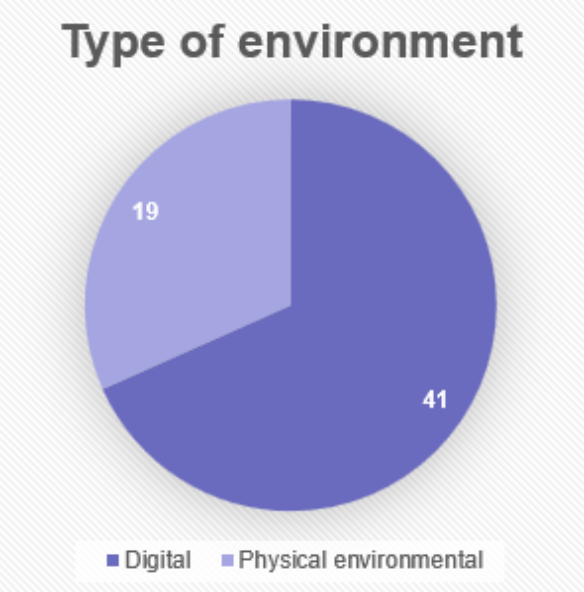
In NET4, a benchmark for existing SHAFE solutions was performed, culminating on a Matrix to synthesize existing knowledge and critically assess practices of inclusive design in SHAFE.

The matrix includes 112 innovative solutions in various domains, such as, architecture, urban planning, interior design, healthcare, and social care.

All proposed initiatives align with the key principles of user-centered design: usability, engagement, inclusion, and accessibility and was assessed based on specific criteria derived from these principles, as well as on FOUR transversal aspects: impact, scale, sustainability, and affordability.



Main practices mapped



MAIN FINDINGS

User-centered design represents a process in which the potential users are involved in the design of a product, tool, software, etc. from the beginning to the final result. The involvement can have various formats; however, the basic steps and requirements are the same.

Four areas / properties are closely related to these processes and were used to assess SHAFE solutions:

INCLUSION

ACCESSIBILITY

USABILITY

ENGAGEMENT

INCLUSION

Inclusion is a universal human right which is based on the idea that every individual has the right to be fully incorporated into society (European Commission, 2021).

ACCESSIBILITY

Accessibility is the design of products, devices, services, vehicles, or environments so as to be usable by people with disabilities (Wikipedia, 2016). The concept of accessible design and practice of accessible development ensures both "direct access" (i.e. unassisted) and "indirect access" meaning compatibility with a person's assistive technology. Accessibility can be viewed as the "ability to access" and benefit from some system or entity. Accessibility is an important issue for older people, especially those with physical or cognitive limitations. The lack of accessibility can be a barrier to healthy and active aging, as well as to participation in society and the economy.

Accessible design is a design process in which the needs of people with disabilities are specifically considered. *Accessibility* sometimes refers to the characteristic that products, services, and facilities can be independently used by people with a range of disabilities.

MAIN FINDINGS

USABILITY

ISO defines usability as "The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use." (International Organization for Standardization, 2018). Usability can be described as the capacity of a system to provide a condition for its users to perform the tasks safely, effectively, and efficiently. Usability is often associated with the functionalities of the product.

ENGAGEMENT

Engagement is a three-part phenomenon, which manifests in one or more of the following three forms:

- **Affective/Emotional** engagement: the extent to which individuals experience a positive psychological reaction or attachment towards a specific activity or situation.
- **Behavioural engagement**: the extent to which individuals can be observed to exert effort and show persistence to remain involved in an activity or situation.
- **Cognitive engagement**: the extent to which individuals are cognitively absorbed in a task or activity resulting in a reduced awareness of their surroundings.

MAIN FINDINGS

To assess the strengths and weaknesses of the different SHAFE solutions, offering an overview of the current landscape, successful implementation, and areas for improvement, 4 other transversal areas were also considered: **impact, scale, sustainability, affordability**.

IMPACT

The assessment of the effects of proposed solutions should consider the concrete and quantifiable advantages they offer to the intended audience. These benefits may include improvements in mental and physical health, increased social connections, and an overall enhancement in the well-being of older individuals. A thorough analysis of the impact of each practice enables us to identify which initiatives lead to meaningful and lasting improvements in the lives of those who benefit from them.

SCALE

The solution should be scalable and adaptable to various environments and to transcends geographical and cultural boundaries, enabling easy replication across disparate communities and environments. A nuanced consideration of different cultures becomes a key aspect in the planning process, ensuring that adaptations are culturally sensitive and resonate with the values of the communities involved.

MAIN FINDINGS

SUSTAINABILITY

Within this domain, it is important to explore various facets, including the funding mechanisms, grants, or collaborative initiatives that can strengthen successful practices. Striking a harmonious balance between effectiveness and economic feasibility ensures that these solutions not only remain inclusive but also stand within reach for a broader demographic. An equitable distribution of the economic burden associated with the implementation of SHAFE practices enhances their appeal and paves the way for wider adoption.

AFFORDABILITY

The assessment of affordability extends beyond the initial implementation cost, encompassing considerations of long-term financial sustainability. Practices demonstrating economic viability, coupled with the potential for widespread adoption, stand poised to generate substantial and enduring impacts on communities.

MAIN FINDINGS

1. Holistic integration of physical, digital, and social dimensions

The research developed so far underscores the environment-centric nature of Smart Healthy Age-Friendly Environments (SHAFE) design. While human-space interaction remains a central point, there is a recognised need to broaden the perspective. This involves **embracing the interconnected dimensions of digital and social aspects alongside the physical environment.** This integration is key for creating a comprehensive and effective age-friendly environment that serves the diverse needs of its users.

2. Deepening understanding through individual dimension exploration:

Despite comprehensive studies and practices exploring SHAFE dimensions collectively, **there is an identified need to examine deeper into each individual dimension of age-friendly environments**. To achieve this, a broader engagement of citizens and end-users in the co-design and participatory phases is recommended. By involving the target demographic in the creation process, **designers gain valuable insights into specific needs and preferences, ensuring a more nuanced and tailored SHAFE solution.**

3. Data-driven design challenges and opportunities:

The analysis recognizes **a lag in using big data and comprehensive data gathering methods for designing SHAFE solutions**. To fully leverage the potential of technology, there is the need for advancements in data analysis, particularly in understanding user behaviors within their daily life contexts. Addressing this gap is crucial for developing more informed and responsive solutions that respond to the evolving needs of the ageing population.

4. Affordability as a key success factor:

Affordability emerges as a critical success factor in ensuring the widespread adoption of SHAFE solutions. **The analysis emphasizes the importance of creating technologies that are not only effective but also cost-effective**. Additionally, these solutions should operate in a transcultural manner, considering diverse societal contexts. This approach facilitates scalability of adoption and ensures sustainability from both organizational and managerial perspectives. By making SHAFE solutions financially accessible and culturally adaptable, their benefits can reach a broader demographic, enhancing the overall impact on the aging population's quality of life.

SHAFE IN PRACTICE

EXAMPLES OF RELEVANT PROJECTS AND INITIATIVES

Academia Sénior da Covilhã

Portugal, NPO

- Includes classes, physical activities, and social activities.
- Target inclusion, engagement, and accessibility.

Link

Dreamlike Neighbourhood

Erasmus+ project

- Organises (non-family) neighbours and friends in activities.
- Address social needs.
- Enable older people to age in place.

Link

Age Friendly Ireland

National Irish Programme

- Addresses the challenges and opportunities.
- Rethink how services are both planned and delivered.

Link

EXAMPLES OF RELEVANT PROJECTS AND INITIATIVES

The Aging in Place Challenge

Canada, National Programme

- Improve the quality of life.
- Shifting focus toward preventive home and community-based care.
- Engages older adults and caregivers as experts.

Link

mobiliSIG

Canada, Project

- Mobility assistance technology for people using wheelchairs.
- Development of multimodal mobile technology.

Link

Bridge the Gap!

Erasmus+ project

- Bridge the digital gap and empower older citizens.
- Focus on training, accessibility, and engagement.

Link

SHAFE PEOPLE

HOW TO ADDRESS SHAFE PEOPLE?

Family - Define unmet needs for each member, and also the support framework - relationship needs collective e/.g., mother and baby - mutual needs. We integrate human centred design as an interconnected relational - emotional and empathetic solutions defined.

Health & Social Care - Primary, secondary and tertiary care providers liaise to identify challenges expressed and experienced, create clear pathways, services and systems (AI, digital, AR/VR, wearables - interactions and emerging technologies - acceptance and adoption) to support and enhance user experience (UX design, user research).

Policy makers – Promote a proactive focus on lived experiences and needs of individuals and families in specific areas of need (urban regeneration, built environments, smart cities and communities, integrated care, digital tools e.g., health care appt management or access to education). Foster policies and collective efforts to empower vulnerable people, promote accessibility and inclusion by all and for all.

HOW TO ADDRESS SHAFE PEOPLE?

Multi-Disciplinary Project Teams - STEAM promoting and encouraging open access and open innovation approaches shared and encouraged as a means to enable good design approaches for all that deliver optimised experiences through innovative and collaborative efforts.
Remember: good design enables, bad design disables!

R&I / Academia - focus not only on technological solutions but also on the context, including special needs, and teach students to identify challenges in the applications developed for general public.

Encourage empathetic curiosity (R&I) to identify opportunities to enable and assist inclusion and accessibility challenges as innovative pathways with people and quality of life in mind, for example, considering how emerging technologies can be supports trusted, utilised and adopted by people.

Promoters / Developers - SME's, companies, organisations need to review practice, delivery and operations that affect and improve or predict how SHAFE environments are created for people and quality of life is ensured with a positive impact, not just focused on current needs but with the future in mind.

LOOKING AT THE FUTURE

Diverse representation: ensure diversity within the group engaged in co-design, **representing a wide range of ages, abilities, and cultural backgrounds**. This ensures that the insights gathered are reflective of the diverse experiences within the population.

3. Data-driven design:

Ethical data practices: prioritize ethical considerations in data collection, ensuring privacy and consent. Implement **transparent communication about the purpose of data collection and how it will be used** to build trust among older users.

Holistic Integration

Individual Dimension Exploration

Data-driven design

Affordability

NEXT STEPS TO EXPAND THE UCD APPROACH

1. Holistic integration

Digital inclusion: ensure that digital elements within SHAFE **are designed with inclusivity in mind.** Consider factors such as user-friendly interfaces, large font sizes, and simple navigation to accommodate varying levels of digital literacy among different individuals.

Social connectivity: integrate features that promote social interaction, such as virtual communities, social networking, or communication tools, to address potential isolation issues. Design interfaces that facilitate easy and intuitive social engagement.

2. Individual dimension exploration:

User-centric co-design: actively involve users in the co-design process, allowing them to contribute with insights into the **specific needs and preferences** related to each dimension of the SHAFE. Conduct participatory workshops, focus groups, and usability testing involving the target groups to ensure inclusivity.

Diverse representation: ensure diversity within the group engaged in co-design, **representing a wide range of ages, abilities, and cultural backgrounds**. This ensures that the insights gathered are reflective of the diverse experiences within the population.

NEXT STEPS TO EXPAND THE UCD APPROACH

3. Data-driven design:

Ethical data practices: prioritize ethical considerations in data collection, ensuring privacy and consent. Implement **transparent communication about the purpose of data collection and how it will be used** to build trust among older users.

User behaviour insights: use **data analytics to gain a deeper understanding of the daily routines, preferences, and challenges faced by older individuals.** This insight can inform design decisions to create more personalized and adaptive SHAFE solutions.

4. Affordability:

Cost-effective technology: focus on developing **SHAFE solutions that are not only technologically advanced but also cost-effective**. This could involve leveraging open-source technologies, promoting the use of existing affordable devices, and exploring scalable solutions that minimize economic barriers.

Public procurement: foresee that the SHAFE requirements are in official tender documentation and make clear and visible to all potential suppliers and designers.

Cultural adaptability: consider cultural nuances in the design process, ensuring that **SHAFE solutions are adaptable to diverse societal contexts**. This involves understanding cultural preferences and norms related to technology use and incorporating them into the design to enhance user acceptance.

MODULE INFORMATION

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THE END!

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