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Online-based participatory design. A Case Study of Developing International Standards During a Pandemic

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ABSTRACT

Standards are essential instruments to ensure the safety, efficiency and quality of products, services, systems, processes, and environments. In pre-pandemic times, the standard development process used to happen through in-person consultation and meetings, however, the COVID-19 pandemic disrupted the whole routine. A team of technical experts from the National Standards Authority of Ireland trialled an online-based participatory design process to support the review and development of a standard through stakeholder engagement. This article introduces the experience of developing a new standard by leveraging emerging digital technologies, through stakeholder participation. This research offers a framework, outlining the steps undertaken during the process, to support future online-based standard development processes in co-operation with stakeholders, by respecting cultures, backgrounds, skills, and experiences.

Keywords: Participatory design, design method(s), standards, qualitative research, online workshops, co-creation.

INTRODUCTION

A standard is a document developed by consensus and approved by a recognized body, that provides, for common and repeated uses, rules, guidelines, or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context (ISO, 2021). Historically technical standards defined requirements for products that were intended for such sectors as construction, machinery, electrical products and have a broad impact on society, in relation to safety, well-being, health and accessibility (UN, 2008).

Traditionally technical standards are developed through an iterative procedure over a defined period using a consultative process, influenced by industry representatives, and focused on product development (Lyytinen & King, 2006). Alongside this developing remit for standards development, there has been a significant increase in attention to involving a wider range of stakeholders directly in the development process, including service designers, providers, and expert end-users (Ostroff, 1997). This has occurred for two reasons, (1) to ensure that standards are applicable and effective (Sanderset al., 2008; BSI ISO, 2021) with and for a wide range of stakeholders and (2) to progress principles of equity, diversity, inclusion, and

accessibility of standards in their creation and implementation (Authors, 2021). Benefits of genuine participatory design of standards or regulations include cost-effectiveness, utility, awareness of technical standards, and clear meaningful evaluation and implementation processes (Mitchell, 2016).

The first step in developing a standard is to establish a technical committee followed by a recruitment strategy and plan for consultation with experts and other stakeholders. In pre-pandemic times, this process typically happened through direct or indirect invitation via email or post, or with the use of social media platforms, followed by a series of face-to-face meetings. While this process could be flexible, depending on the standard and the stakeholders involved (ISO, 2014), in-person meetings were most often the bedrock of such consultation and development of the standards.

However, public health guidance and travel restrictions associated with the COVID-19 pandemic disrupted the normal standards and traditional stakeholder engagement processes (Abdullah et al., 2020). Nevertheless, this disruption also provided unique opportunities that would allow a diverse (and, in some cases, vulnerable) group of people to safely engage with the standards development processes, by embracing technology and using procedures that were rarely tested before (Kennedy et al. 2021).

Given the global crisis and uncertainty surrounding when 'business as usual' processes could resume, the need for a rapid shift to consider alternative ways of developing and delivering standards and services has been evident (Agostino et al. 2020). Therefore, a team of technical experts from the National Standards Authority of Ireland (NSAI) decided to trial an online-based participatory design methodology for stakeholder engagement to inform the development of a new ISO standard on dementia-inclusive communities. New emerging technologies, together with the principles of ethnographic research and a transdisciplinary approach (Santamaria et al. 2015; Crilly et al., 2008), were used to maximise the opportunities presented by the pandemic, namely, that a broader range of stakeholders could potentially be included for consultation, with less burden caused by in-person meetings and long and costly travels across the country to reach the central office of the National Standard Body.

To ensure that the participatory process followed the requirements of recent standards and their goal to take an inclusive approach (NSAI, 2019), this article explores and portrays the experience in engaging in the feedback collection and review of a new standard on dementia-inclusive communities, during a pandemic, by using emerging digital technologies, and the power of participatory design combined with a transdisciplinary approach (Bianchin et al., 2018). Contextual elements that supported the creation of such an inclusive process relate to optimising accessibility, inclusion, diversity, and equity for all stakeholders who took part at different stages of the process, with the added benefit of reducing the carbon footprint of the standard development process.

This paper describes a detailed framework, with steps undertaken during the process, to support future participatory design and co-creation processes to develop standards with the cooperation of stakeholders by respecting different cultures, backgrounds, skills, and experiences.

1. APPROACHES TO FOSTER PARTICIPATION AND COMMUNITY BUILDING

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The participation of stakeholders during the design, creation, and development process finds its roots in the middle 20th century. Heightened by a need to include service user views in healthcare decisions, participation through Public Patient Involvement (PPI) in healthcare service development emerged in the 1950s (Wilson et al., 2015). Participatory design, originally named cooperative design and lately co-design, is a democratic process for designing social and technological systems involving human work, based on the argument that users should be involved in designs that they will be using and that all stakeholders, particularly end-users, have equal input into the process (Muller & Kuhn, 1993).

An early example of involving people in the design process is represented by the work of the Norwegian Iron and Metal Workers Union in the 1970s, an era characterized by a sociotechnical design tradition (Bødker & Pekkola, 2010). Another example of participatory design with a commercial product as an outcome, dates back to 1981, where the UTOPIA project aimed to overcome barriers to workers influencing workplace technology and organizational work practices (Bødker et al., 1987). Later, in the 1990s, the PICTIVE method, developed by Muller (Muller, 1991) represents one of the most popular examples of the adaptation of participatory design specifically to Human-Computer Interaction (HCI) (Authors, 2021).

Participatory design became a well-established approach to design and develop functional products, services, environments, and solutions through active involvement of public stakeholders and decision-makers in cooperation with designers and engineers, to ensure that the outcomes effectively meet the needs of an extended audience of users. One of the most pivotal aspects of participatory design is the focus on the involvement of users in all stages of the process by allowing them to take part in discussions about a topic, perform need-finding, and identifying possible requirements that the product or service should have.

Several terms can be grouped under the umbrella term of participatory design. Co-creation is a very broad term that refers to involving end-users to achieve more relevant and usable products and services while reducing risk (Ind et al., 2013). Co-design represents a meaningful end-user engagement in research design and across all stages of the research process and ranges in intensity from relatively passive to highly active involvement from end-users (Bird et al., 2021). Co-production is often used for more involved processes such as the planning and delivery of public services (Bovaird, 2007) with an expectation of more engaged interaction than is always the case with co-design. Co-development constitutes a development process through early and in-depth involvement of customers (Neale, Corkindale, 1998).

These terms have often been used interchangeably and in different domains, but with very similar meaning: genuinely involving stakeholders in the process (Miah et al., 2019). The standard development activity is normally defined through an interchangeable set of stages, by identifying the need to set a standard, defining the scope of the standard (e.g., the technical, environmental, or safety specifications which need to be set), consulting with other interested parties to achieve consensus in as much as is possible, and publishing the agreed standards for the relevant product or service issuing certification (NSAI, 2021).

There are several overlaps between a participatory design process for creating products and services and the standard development process. They both require engaging with stakeholders from the start and fostering continuous engagement during the co-development process. Notwithstanding that most of the participatory design processes could be treated as similar, the novelty of the process described in this article is grounded in the contemporary

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approach of using emerging digital technologies from the start to finish, to bridge the challenges brought about by the pandemic and related public health restrictions.

2. CASE STUDY: MATERIALS AND METHODS

The standard discussed in this paper was developed by the International Organization for Standardization (ISO) as part of the ISO Technical Committee (TC) 314 – Ageing Societies. The standard, known as ISO/FDIS 25552 - Ageing societies - Framework for dementia-inclusive communities, provides guidance to communities on principles, processes, tools, and integrative measures that determines dementia-inclusive communities (ISO, 2021).

This standard was developed in response to the worldwide recognition that individuals, families, and communities need to be more inclusive concerning people living with dementia (UN, 2021). A draft standard and a number of iterations were circulated to a range of national mirror committees throughout the world for feedback in line with the standard ISO consultation process. As part of this process, the National Standards Authority of Ireland (NSAI), established a national working group within the Ageing Societies Technical committee (NSAI/TC 023/SC 06/WG 03 "Ageing Societies") to review and comment on each version of the draft standard.

To develop an efficient, inclusive process for feedback collection and review of the standard, while living in a socially restricted pandemic, a remote participatory design process was created under the NSAI between late 2020 and 2021. To efficiently review the draft standard ISO/DIS version from the ISO/TC314 working group the NSAI project manager, with the two chairs of the national Technical Committee, defined an inclusive process composed of five intertwined stages.

Stage one focused on creating an overarching Technical Committee, a group of experts with expertise related to the standard domain, including dementia, age-related impairments, and dementia/age inclusive design, which would identify and recruit expert stakeholders that would represent the wider range of users.

Stage two focused on creating an inclusive and equitable representation of relevant stakeholders affected by or interested in the standard domain setting that included persons living with dementia, carers, healthcare service users, frontline service providers, associations, working groups, and organisations representing people of different ages, gender, and abilities.

Stage three concentrated on developing a procedure to include and enable every stakeholder to provide individual feedback to the standard before the final submission to the ISO/TC314 technical committee.

Stage four involved the organisation of four participatory workshops to review the entire draft standard to highlight challenges that real users experience and providing recommendations to improve its content.

Stage five comprised a follow-up activity of a webinar with the goal of fostering an open discussion amongst stakeholders, a review of the input to the draft standard and to further explore the importance and possibilities of dementia-inclusive communities in Ireland. This process involved more than 150 members of the community and facilitated strong advocation for this new standard across the whole country.

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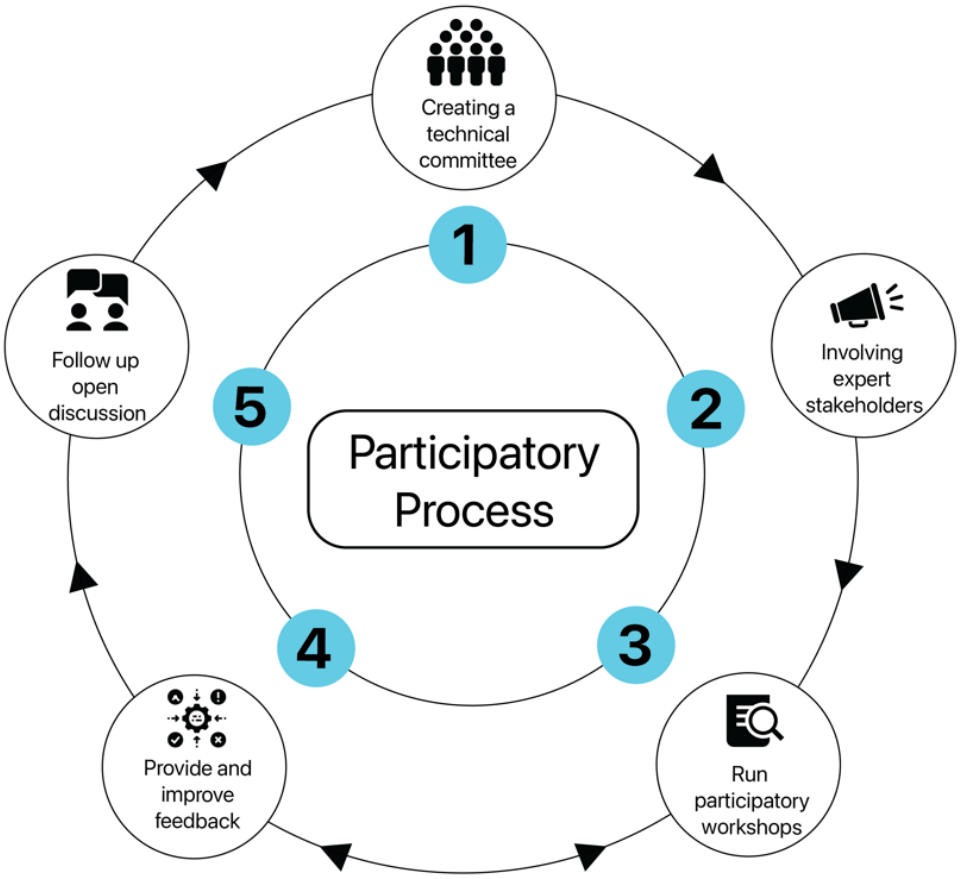

Figure 1. Illustration of the bespoke Inclusive process.

The fundamental principles for these workshops were centred on allowing time, space to all participants and considering a balanced approach between the discussion of values and agreeing on background issues and priorities and technical input for the standard document (Goodman-Deane et al., 2020). Furthermore, adopting an inclusive approach that placed people living with dementia, family members, and carers at the centre of the process, and creating a space where people can listen and be heard was prioritised throughout the workshops (Authors, 2020).

2.1. Pre-workshop phase

During stage one, the pre-workshop phase, careful consideration was given by the NSAI project manager and the two chairs of the national committee to identify key experts who could efficiently recruit other stakeholders from healthcare, associations, user groups, and industry with an approach to guarantee inclusion, equity, and diversity principles. Key experts were contacted through a snowball sampling approach, ranging from healthcare, research, design, and business groups, whose work could benefit from the co-operation in standard development to business or research partners who have expertise in similar research domains (Watts-Englert, et al., 2014). Through a series of first level and second level connections, four key experts were carefully chosen by checking their expertise in the domain area, geographical spread, gender balance, and ability to involve other potential stakeholders from around the country through widening potential networks. After the initial recruitment, the newly formed committee moved to stage two by designing an inclusive participatory process of consultation with diverse stakeholders around the whole country.

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This process commenced with the creation of a comprehensive list of potential stakeholders and agencies to be invited by responding to criteria of inclusiveness, and representation of the broad needs of people living with dementia around the country. The committee members drew on their personal and professional networks and recruited stakeholders ranging from 18 to 80 years old, living in different regions of Ireland. The first contact with potential stakeholders was made via email and telephone to gauge interest in their involvement in the process and options for involvement included some or all of the following roles: (i) independently reviewing the draft standard, (ii) participating in four participatory design workshops, (iii) if unable to join the workshops, stakeholders could submit comments via an online portal, and (iv) comments related to the draft standard could be emailed or posted directly to the NSAI.

Thirty-eight stakeholders were recruited with particular focus on people living with dementia, members of the National Dementia agencies and Advocacy Groups, expert researchers, health and social care professionals, family and residential care representatives, designers, engineers and architects involved with the design of age- and dementia-accessible products and environments.

2.2. Workshop and follow-up phases

The workshop and follow-up phases were composed of stages three, four, and five. The process was considerate of a number of factors, (i) time, as the target timeline was about 14 weeks (January-April 2021), (ii) delivery format, with only online/virtual meetings, and (iii) the co-design approach to review the standard in different sessions. During stage three, the members of the national committee brainstormed themes, questions, and tasks to be performed during each of the four participatory workshops. In each workshop, recommendations to improve the content of the draft standard was collected and collated, followed by a final review session during workshop four, with feedback from participants. Once the structure of the workshop was created, key dates were agreed, and the four workshops were scheduled for three hours each. A workshop leader, facilitators, and supporting documents were identified and the workshops ran over 12 weeks, between February 2021 and March 2021. This timeframe allowed the national committee to have enough time to review and comments, revisions, and suggestions to the draft standard in time for the delivery to the ISO in April 2021. A total of 46 stakeholders (38 of whom were external stakeholders, with 6 experts from the national committee) participated.

Before the workshops, stakeholders received two documents: the draft standard and the ISO commenting template, normally used to help identify and list potential topics for discussion. Copies of the draft standard were delivered via email, with digital, screen-reader enabled format, and by post for those users who preferred to have a paper copy. To facilitate the working group activities and understanding of the process, the national committee members created examples of using the draft standard and commenting template, based on their differing perspectives, and the examples of general, editorial, and technical comments were outlined for discussion during workshop one. Through this technique, those commenting were supported with clear examples about how to give written feedback on the standard.

During the workshops, facilitated through a popular remote meeting platform, every stakeholder was encouraged to actively participate, to suggest changes, modifications, and review according to their personal and group experience. To enable people without strong

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broadband to take part, having a video on was optional throughout the workshop. In addition, splitting participants into smaller online breakout sessions (between four to six participants), moderated by one member of the technical committee, ensured a more bespoke qualitative data collection approach. The final closing workshop was used to perform a final review and provide further information on the following stages to all participants. The whole participatory process facilitated a more value-based conversation, and all feedback was analysed to draw out key themes with a thematic analysis process (Braun & Clarke, 2016), as represented in figure 2, that would be used to set the tone, and underpin discussions for the rest of the process.

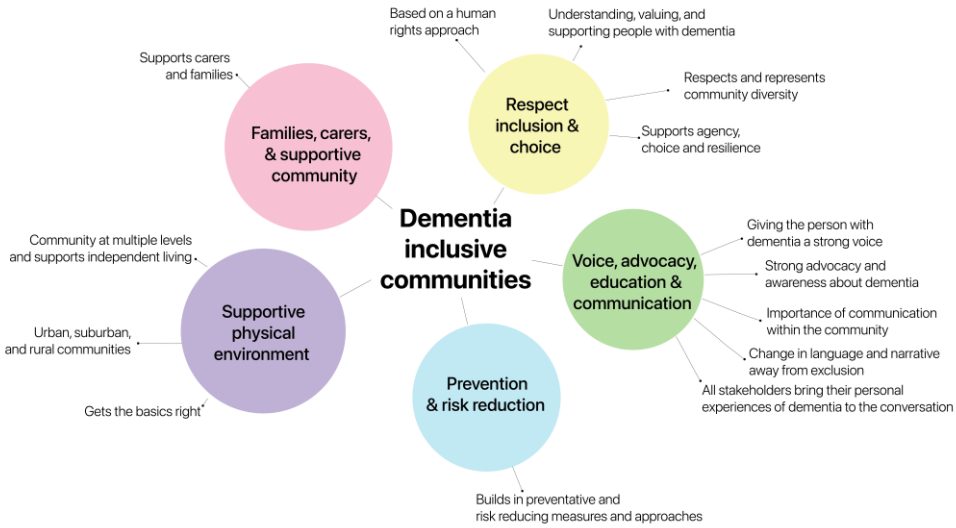

Figure 2. Thematic analysis of the feedback recorded during the breakout room.

2.3. Workshop one

The aim of workshop one was to offer an introduction to the standard, to detail the overall review process, and to ensure stakeholders were comfortable with the participatory process as well as the online technology being used. Committee members engaged 38 stakeholders in an informal dialogue on the topic of what a dementia inclusive community meant to them as individuals and their perspective on behalf of their community. An important part of the workshop was to run different breakout rooms where all attendees discussed on the topic of "What does a dementia–inclusive community mean to me?". Table 1 summarises the format and activities of workshop one.

Table 1: Schedule format of Workshop 1

Duration	Details of structure	Purpose	Lead members
20’	Welcome and Introductions by Chairs of National Committee	Introduce members, background, expertise	Project Manager Chairs Committee
15’	Overview of Draft Standard ISO/DIS 23623	Offer a historical overview of standard	Project Manager Chairs Committee
15’	Workshop Planning	Outlining the process ahead	Project Manager
30’	Stakeholder involvement and engagement by stakeholders Review and commenting process	Outline of the process ahead of the formal process to comment on the standard	Project Manager
10’	Break		

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Duration	Details of structure	Purpose	Lead members
30’	Breakout session with Facilitators random selection of participants (6-8 persons per breakout room) Question: What does a dementia-inclusive community mean to me?	To get broad comments back on the document as a whole from the stakeholders	Project Manager Chairs Committee Stakeholders
20’	Group discussion, wrap up Q&A session and close of workshop 1	Finalise workshop 1	Project Manager Chairs Committee Stakeholders

2.4. Workshop two

The aim of workshop two was to ensure a continuation of the discussion from workshop one and to provide a detailed review of a specific section of the standard. Approximately 27 stakeholders took part in workshop two and facilitators strived to ensure that both individual and the group’s collective voice was being heard from the start of the process, to ensure meaningful engagement. Stakeholders indicated that they were comfortable with the review process and understood the commenting template. An important element of this and subsequent workshops was summarising of agreed and outstanding points for discussion from previous workshops at the outset, to illustrate that all feedback was being considered and recorded, and to show respect for the time of all involved. Table 2 summarises the format and activities of workshop two.

Table 2: Schedule format of Workshop 2

Duration	Details of structure	Purpose	Lead members
10’	Welcome and Introductions by Chairs of National Committee	Introduce members, background, expertise	Project Manager Chairs Committee
45’	General session - Feedback on Breakout session (Themes from Workshop 1)	To get broad comments on the document as a whole	Project Manager Chairs Committee
15’	Breakout session to discuss themes from Workshop 1	To get detailed comments on the document as a whole	Project Manager Chairs Committee Stakeholders
10’	Break		
45’	Specific discussion on ISO DIS Draft – Clause 3	Group discussion on terms and definitions and discussion on comments received to date	Project Manager Chairs Committee Stakeholders
20’	Group discussion, wrap up Q&A session and close of workshop 2	Finalise workshop 2	Project Manager Chairs Committee Stakeholders

2.5. Workshop three

Before workshop three commenced, all completed commenting templates that had been submitted by the workshop participants were collated into one master document and first reviewed by the project manager. The aim of this workshop, which was attended by 21 stakeholders, was to collect the last round of comments and involve active decision-making in accepting or rejecting comments. At this point, all participants were familiar with the concepts and outstanding issues from previous workshops and so the focus could narrow to areas of any dissent or lack of clarity. The workshops focused on specific clauses within the standard and participants were placed into small breakout rooms to discuss each comment and collectively agree if the comment should be accepted or rejected. Table 3 summarises the format and activities of workshop three.

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Table 3: Schedule format of Workshop 3

Duration	Details of structure	Purpose	Lead members
10’	Welcome and Introductions by Chairs of National Committee	Introduce members, background, expertise	Project Manager Chairs Committee
45’	General session - Review of comments on Clauses Workshop 3: Clauses 4,5,6, workshop 4 clauses 7 and 8.	Review and collect comments on specific clauses	Project Manager Chairs Committee
15’	Breakout session to discuss Review of comments on Clauses (3X groups each workshop)	To get detailed comments on the document as a whole	Project Manager Chairs Committee Stakeholders
10’	Break		
45’	Group discussion on comments unresolved from breakout session	Group discussion on unresolved comments	Project Manager Chairs Committee Stakeholders
20’	Group discussion, wrap up Q&A session and close of workshop 3	Finalise workshop 3	Project Manager Chairs Committee Stakeholders

2.6. Workshop four

The last workshop aimed to review all completed commenting templates and obtain approval for collating the reviews performed during the first three workshops in one master document. In the breakout rooms, the 25 stakeholders were able to discuss each comment and collectively agree if the comment should be accepted. Table 4 summarises the format and activities of workshop four.

Table 4: Schedule format of Workshop 4

Duration	Details of structure	Purpose	Lead members
10’	Welcome and Introductions by Chairs of National Committee	Introduce members, background, expertise	Project Manager Chairs Committee
45’	General session - Review of final comments	To get final comments on the document as a whole	Project Manager Chairs Committee
15’	Breakout session to discuss Review of comments on clauses	To discuss final comments	Project Manager Chairs Committee Stakeholders
10’	Break		
45’	Group discussion on comments unresolved from breakout session	To finalise and accept comments	Project Manager Chairs Committee Stakeholders
20’	Group discussion, wrap up Q&A session and close of workshop 4	Finalise workshop 4	Project Manager Chairs Committee Stakeholders

2.7. Webinar

To ensure that a participatory process was guaranteed after the main development stages a series of follow-up emails were sent to the working group with updates on the procedure, and a final webinar was organised. The webinar, organised after the delivery of the standard to the ISO/TC314 committee, aimed to share the experience to members of the community and to collect opinions from the participants of the working group to better frame a participatory process for online, remote standard development.

3. RESULTS AND DISCUSSION

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Developing standards according to a democratic, people-oriented process that involves expert users (Ostroff, 1997) can help committee members to elicit feedback on the direction that the future standard has to take before public release.

By leveraging on the potential of online shared documents, emails, and online social communication platforms the NSAI national Technical Committee organised, ran and tested a novel method for developing standards through a remote participatory design process.

Given how quickly the national committee devised and implemented a novel participatory process to meet the call for NSB's from ISO/TC314 for the review of a standard, standard creation, highlights the ability of human beings to adapt, as well as to foster innovation, across different geographical locations and cultures.

This reflection on a novel process, illustrates the development of an ad-hoc process for NSAI, that was inclusive of people with different age, abilities, gender, culture and with different digital literacy skills (Authors, 2020) and that used a mix of digital emerging technologies that, to our knowledge, have not previously been used simultaneously for this particular process. The length of this consultation was sufficient to review, modify, adjust and make recommendations for the improvement of the draft standard being developed, through the feedback from the stakeholders following workshops and online activities. Some of the major feedback that was collected through observations and debrief of national committee members involved in the process, refer to three thematic areas.

The first refers to the communication of information and deliverables and the ability for every member of the team and participants to be constantly updated. It was essential to have time to process feedback between workshops, organise priorities for subsequent workshops and consult between members of wider stakeholder group and the national committee members. Secondly, smooth administration of the process was vital, having a key member of staff who took responsibility for document management, online forum set up and facilitation and scheduling for both stakeholder group meetings and between workshop meetings, ensured that the whole standard review and development process was running smoothly and within the set timeframe. The third aspect which facilitated a thorough consultation process relates to the interdisciplinarity of the resources and people who have been involved with this process. Having a mix of key professionals on the national committee allowed diverse views on language, priorities, and planning for accommodation of a wide network of views within the workshop, this kind of interdisciplinarity is essential for standards which hope to address complex social concepts such as dementia-inclusive communities.

The communication through online meeting platforms and the use of shared documents and paper versions mailed to participants, allowed them, even those who were older adults, or people with cognitive impairments to participate, by planning for them to take more time to read, comment and share their opinions regarding the standards review process. The welcoming and orientation sessions that were delivered at the start of each workshop allayed possible fears for most of the stakeholders regarding the use of digital emerging technologies as well as address any queries they had regarding their role in the consultation process. Additionally, the remote meeting format allowed people with mobility impairments to participate in every session, something that in previous times would have been intimidating or impractical. There was also the possibility for those who had working responsibilities or childcare responsibilities to participate, this was true for many women who work as frontline

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healthcare workers, where a meeting which required travel time could have meant they could not have attended to represent their association and/or professional body.

The logistics and communications managed by a dedicated administrator ensured by optimal coordination from the national Technical Committee during each workshop, with reminders from the project manager fostering a clear and efficient process in managing queries and paperwork. This coordination done remotely before, during and after the workshops was pivotal to ensure maximum stakeholder involvement, and that none of the details and reviewing comments were lost.

The interdisciplinary nature of the core team, as well as the stakeholders, thanks to widening networks and fostering inclusive connections, enabled a rapid involvement of a variety of stakeholders from across the country. The results of the work done across the 14 weeks, and the positive feedback from the ISO central committee at the submission of the final draft standard, demonstrated that the involvement of multiple stakeholders, by fostering a participatory design process using remote online emerging technologies, was essential to create the new technical standard on Dementia-inclusive communities.

As a lesson learned for future standard development processes, it is crucial to highlight the importance of giving people a sense of participation and belonging and this was the tone taken at every workshop. In addition, flexibility was built into the workshops themselves in relation to the contributions during the workshops (large and small groups) (e.g., small groups gave people the understanding that every little contribution was valuable and indispensable), and before and after the workshops by working on shared documents, were all essential to ensure a high satisfaction rate from stakeholders and the central ISO committee. We anticipate that this framework could be employed for the development of future standards and would help other national standards bodies in implementing similar processes in their standard development stream, but also to improve it with new practices, technologies, and innovative strategies.

4. CONCLUSIONS AND FUTURE IMPACT

How we elaborate standards is changing. Technical standards were traditionally developed by industry for industry, however in recent years, the process has been democratised to external stakeholders through participatory processes. Given the widening remit of standards development entering social and civic society, the need for a means of a shared understanding across disciplines to support transdisciplinary work through co-designing is tremendously important. It is imperative to acknowledge that participatory methods and co-design principles have also gained prominence in health and social care service design in addition to engineering and product design. This parallel change means that professions from different disciplines such as health, social care, engineering, architecture, and policy are aware of similar values and processes about participatory design processes.

This article shows the benefits of using remote participatory design processes, supporting a shared language across disciplines and industries. Having the opportunity to engage with stakeholders, and in this case with persons living with dementia and caregivers, ensured that the requirements and recommendations specified in the standard could be applied in the community, thus highlighting the need for user-centered design and engagement.

Adopting a participatory approach in this process required a balanced attitude that:

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- allowed time, space, and a process for respectful debate to develop the kind of understanding and empathy required to reach a consensus on key issues.
- discussed values and agreed background issues and priorities, in addition to capturing direct feedback and technical input for the standard document (see workshop 1).
- adopted an inclusive approach that placed people living with dementia, family members, and carers at the centre of the process and created a space where people can listen and be heard.
- supported and empowered committee members by providing them with key information and practical advice to build confidence to provide meaningful and considered feedback.

The use of emerging digital technologies brought a novel, efficient and inclusive approach in a traditional participatory technical standards development process that was held mostly in person before the pandemic.

Although this is a first exploratory study, run under extraordinary conditions, the results achieved, and the feedback collected during the sessions highlights the potential for this fort to enhance efficiency and inclusiveness of future standard development. In future, the findings of these consultation programmes and the views of people who take part could be planned as research projects from the outset - this could require more administration in terms of ethical approval processes but could allow for richer dissemination and deeper understanding of the process from all parties than was possible in this paper. Additionally, this type of engagement facilitates stakeholders to effectively engage over a short period rather than the long period of 3 years which is the normal timeframe of the standardisation process.

It is envisaged that the lessons learned will be implemented for other standards development processes, as supported by NSAI. In addition, these lessons will be used to further optimise and improve the process in as part of a participatory process with key stakeholders.

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