



Short Communication

# Co-creation Initiatives in Healthcare in Small Communities

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## Abstract

The uses of technology in public spaces are not new, but now we find new forms of social interactions and practices, socio-spatial representations and relationships. The close relationship between real and virtual worlds also opens up new ways of advancing knowledge. In order to facilitate the implementation of Open Science, we explore different co-creation methods with multiple stakeholders. All groups are involved and have influence throughout the project lifecycle: from the beginning, to planning, to implementation, to dissemination. Research activities should involve a wide variety of stakeholders interested, including government, educators, nurses, charities, civil societies, patient groups and the publics, based in a way to (1) obtaining contributions by customers, (2) selecting the best of these contributions, and (3) incorporating these selected contributions into products, processes, or services. Interactions between Information and Communication Technologies (ICT), public spaces, and healthcare are considered as a tool for connecting people in small communities (enhancing participation). A Platform (DXP - Digital eXperience Platform) through "headless" technologies may provide content management capabilities and easy integration with devices and various sources, driven by user needs and developed with the concept of "Community in mind" in order to create strong and active communities and transform our small communities into more human environments, rather than just more high-tech places, and to understand that "smartness" should be people-friendly. It was applied the Responsible Research and Innovation (RRI) principles on the scientific process and governance, identify drivers and barriers, interests and values for current and future societal challenges.

**Keywords:** Co-creation; Smart technologies; Health; Wellbeing; Small communities; Nursing; Healthcare; Open-science; Responsible Research and Innovation (RRI)

**Abbreviations:** ICT: Information and Communication Technologies; DXP: Digital sXperience Platform; RRI: Responsible Research and Innovation

## Introduction

Responsible Research and Innovation (RRI) is a term used by the European Union’s Framework Programmes to describe scientific research and technological development processes that take into account effects and potential impacts on the environment and society [1,2]. The interactions between the use of technology and the use of public spaces are not new and the close relationship of real and virtual worlds opens up new ways of gathering and interpreting the data, and disseminating the acquired knowledge. In co-creative projects, research activities should involve a wide varieties of stakeholders interested, including government, educators, nurses, charities, civil societies, patient groups and the publics, based in a way to a) obtaining contributions by customers, b) selecting the best of these contributions, and c) incorporating these selected contributions into products, processes, or services. All groups are involved and have influence throughout the project lifecycle: from the beginning, to planning, to implementation, to dissemination.

MELTIC project begun with a prospective study of state of art about the use of technologies in projects, activities and initiatives that take up aspects of interaction among users, ICT and social behavior, planning methodologies and public involvement. Result of these findings are presented in [3]. The work done can be found on MELTIC project Website [4,5]. It covers all work carried out by the same research team.

Different stakeholders were included to share their interests and values and generate new ideas, concepts, products and projects and this part presents a tool for the management of creative teamwork. “Manual Thinking” is a tool for the management of creative teamwork [6,7]. Its format of maps and labels allow teams to affront any topic, obtaining immediate results with a visual and valuable appearance. Its participative approach fosters team commitment and alignment. Furthermore, thanks to its work templates, the tool simplifies the implementation of any method for creativity, strategy and organization.

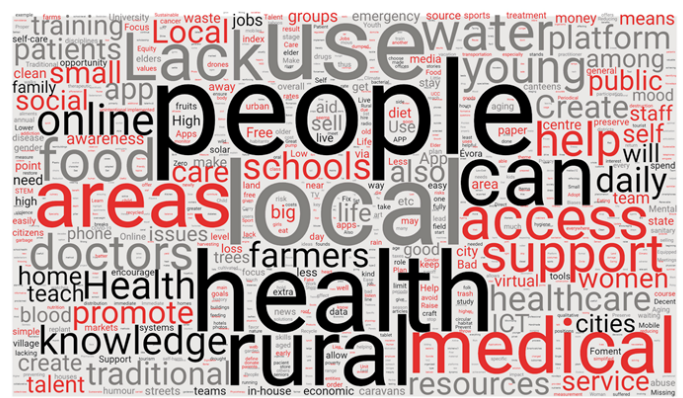
### The co-creation was based in following spaces and moments:

1. A process to explore topics joins
2. A join phase of ideation
3. A phase of organization of inputs
4. Visualization of the final ideas

The tools want to offer a practical and pleasant alternative to screen based and sedentary work habits, offering a format through which individuals and teams can actively engage with cognitive tasks, obtaining immediate visual results. With its hands-on approach, the tools aim to increase the creative and learning capacity of the users.

A customized work-process has been designed and prepared on the tools, which have been sent out to each region. The tools have been conceived as a solution to involve users and clients in the creative development process of functional and innovative products. A Dossier was produced with the results of workshops [8]. The MELTIC Workshops brought together various European municipalities to look for solutions related to health and wellbeing in small and isolated communities, where each municipality is looking for health related problem areas, opportunities and solutions for their region.

The workshops was continued with a series of assignments, in which the contents of the workshop were further evolved into new ideas, which are organized by families and selected by popularity. The resulting selection of ideas is organized by families of similarity. The last assignments were also filtered through a wordcloud application, in order to visualize the keywords of the created content. In these clouds, repeated words are visualized larger than others, displaying the keywords of the text at glance, as is presented in Figure 1.



**Figure 1:** Wordcloud, all maps.

Interactions between ICT, public spaces, and health are considered as a tool for social and health reporting and planning, connecting people in small communities (enhancing participation). A Platform (DXP - Digital eXperience Platform) may provide content management capabilities and easy integration with devices and various sources through “headless” technologies. The DXP defines the interaction between users and technology, driven by user needs and developed with the concept of “Community in mind”: in order to create strong and active communities that allow

rural populations to strengthen ties with their neighbors, nearby populations, or anywhere else in Europe. Headless platforms, by definition, are prepared for omnichannel communication with the user: a) the content is found in one single place without the possibility of inconsistencies or ambiguities due to the distribution of copies, b) interaction with the user is stored on the platform, regardless of the number and types of devices (computers, tablets, smartphones, ...) with which the service is accessed and c) they provide flexibility to content creators by not worrying about the way in which they will be presented to users. Omnichannel, together with headless technology, facilitates the personalization of the user experience, providing content and services of interest to them based on their location, language, preferences and way of accessing the technological platform. IT infrastructure, in terms of communication and mass storage, is redundant, with all the security and safe access features made available in order to avoid service failures and unauthorized access.

The functionalities of the platform are conceived as modular components and / or microservices, with open interfaces, low coupling and high cohesion, which will provide security and high scalability in the services provided. Essentially, the microservices architecture implies the development of software as a set of small, modular services with unique processes, independent implementation, and communicating with each other through a simple and well-defined mechanism. In Figure 2 are showed the main groups of metadata.

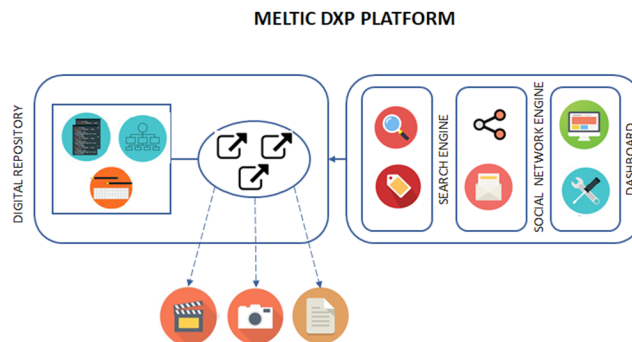


**Figure 2:** MELTIC main groups of metadata.

- **User Profile:** set of user preferences registered in MELTIC DXP, to offer a customization of the platform according to their tastes and needs.
- **Location:** all content and services classified by their location characteristics.
- **Media:** identifies the type of content and services.
- **Contents:** topics or areas to which the contents and services belong, and defined in the MELTIC working groups.

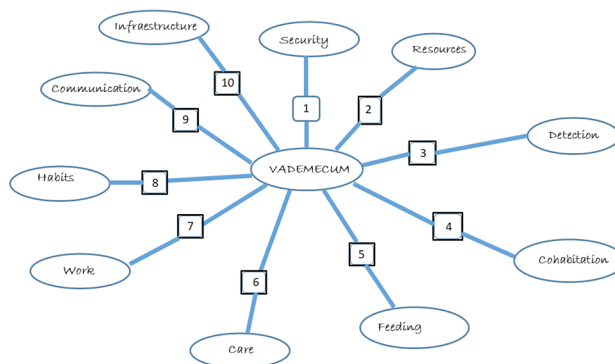
The following Figure 3 shows the most important components of the platform, grouped by user functionality. It

represents two large blocks, an internal or private one that contains all the platform’s resources (content and services), and an external or public-access one that offers the tools that are required to access MELTIC resources. More information may be obtained in [9].



**Figure 3:** Functional components of the METIC DPX Platform.

Along this work, is showed a model for cooperation among rural and friendly cities actors and researchers, and the ideas generated during the co-creation workshop were collected in a Vademecum of 100 Challenges for Healthcare and Wellbeing in Rural Areas showed in Figure 4 and it was presented as D 5.2 Elaboration of conclusions for ICT in Health and Biomedicine Research VADEMECUM [10] and is accessible in video format at [11]: <http://hdl.handle.net/20.500.12105/12786>.



**Figure 4:** Vademecum.

## Conclusion

The use of ICT in social and healthcare environments provide a lot of benefits and an important advance in the transformation of public spaces, whilst also promoting interaction and communication between isolated and disperse communities, improving the efficiency, quality, equity. Due to the rapid development of technologies and their application, there is a permanent need to monitor and support the work of ICT researchers, urban designers and social agents.

The stakeholder analysis highlighted that the use of smart technologies in public spaces is increasingly creating new forms of interaction and social practices, as well as creating new socio-spatial relationships. These types of new relationship scenarios drive the need to rethink social practices and the use of public spaces, which can also influence the development of ICTs. Website-based interventions play a key role in fostering the ubiquitous and proactive health and social oversight, care services of the future, and have the potential to reach a large population by completing what is already available on the Internet.

The use of technologies to promote health and well-being is an idea highlighted by everyone. There is a great interest in getting healthcare professionals involved in the development of the DXP with the objective of promoting healthy behavior and well-being throughout life, from the early year's right up to old age. Another aspect described is the possibility of cultural adaptation in different communities through the support of this platform.

It provides content management capabilities and ease of integration with devices and various sources through headless technologies. The Digital Experience defines the interaction between users and technology, an initiative driven by user needs. Headless platforms are prepared for omnichannel communication and allow user experiences to be personalized, providing content and services of interest based on their location, language, preferences and mode of access to the technological platform.

However, these successful factors may be accompanied by drawbacks in the assessment of co-creation methodology. It has been considered interesting to highlight rural populations or regions with a disperse population, marginal conditions, depressed areas and the existence of a digital divide. The study of these critical factors can guide not only promotion, but also prevention in social and healthcare applications.

The ideas generated during the co-creation workshop were collected in a Vademecum of 100 Challenges for Healthcare and Wellbeing in Rural Areas, as showed in Figure 4 and it was presented as D5.2 Elaboration of conclusions for ICT in Health and Biomedicine Research VADEMECUM [10,11].

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