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Abstract: The current crisis of participation and crisis of engagement of Western societies also affects the application and the validity of the participatory design methodology. Traditional techniques to collaboratively design future solutions with the users and bring their knowledge to the technology application might not no longer be sufficient for the complex nature of our societies. This paper describes the applied research and design of a Digital Companion with AI-based profiling, needs matching, and service-access supporting chatbots. The objective of the Digital Companion is to enhance both the effectiveness of the services currently provided to migrants and refugees by local public administration and organizations, and the life quality of the migrants themselves. The adoption of participatory, iterative, and experimental co-creation approaches allowed to contribute to the innovation of the participatory design framework at a theoretical and methodological level, as is required in order to turn participation into action, to go beyond the mere public consultation and to find new pathways for involving all the citizens (not only migrants or local service providers) as a first step to build a successful project.

Keywords: participatory design; social integration; AI-based technologies

1. Introduction

Co-creation proves to be crucial for innovating and adopting solutions for local service providers, for increasing their capability to cope with migrants and refugees' needs and to foster citizen engagement. The purpose of this article is to summarize the activities, the methods and the results of co-creating services for migrants.

Co-creation specifically refers to an active involvement of end-users in developing ideas, content and services throughout the whole production process. The adoption of co-creation is usually based on two drivers (Voorberg et al. 2015):

1. Cost-effectiveness, with end-users performing specific tasks as co-producers in the production chain (Prahalad and Ramaswamy 2000; Vargo and Lusch 2004; Von Hippel 2007);
2. Addition of value, with end-users engaged as service designers and innovators through co-creation (Prahalad and Ramaswamy 2000; Vargo and Lusch 2004).

In particular, in the public sector, the end-users are often citizens. Recent contributions from theory (Kattel and Mazzucato 2018; Tõnurist et al. 2017) and practice (Concilio et al. 2014; Deserti and Rizzo 2015) are recognizing that public sector innovation based on top-down models mainly promotes efficiency and performance. A particular focus is put on cost-reduction and time-based performance indicators that originated in business and were then applied to public services, whilst failing in taking into account citizens' needs and societal challenges. As a response to these challenges many public administrations are trying to introduce co-creation as a new public service paradigm, with a particular emphasis on the development of a more human-centered approach to innovation to build a better society (Strokosch and Osborne 2016).

According to the European Commission (2011, p. 30) "social innovation mobilizes each citizen to become an active part of the innovation process". The annex "User-centricity principles for design and delivery of digital public services" of the Tallinn Declaration on eGovernment (EU/EFTA eGovernment Declaration 2017) highlights how digital means should be used to involve citizens as well as policy makers in the creation of public services in providing better digital public services. The active involvement of citizens in policy definition has been originally seen as a reaction to the distrust toward politics and representative democracy in the 1990s (Moss and Coleman 2014; Bartoletti and Faccioli 2016). Active participation is instead perceived currently as a tool for improving the effectiveness, the quality and the adoption of policies and decisions addressing relevant and complex challenges on both a global and local scale, ranging from education to sustainability to the redesign of public services delivery.

Citizens are perceived as important partners in developing and redesigning public services (Voorberg et al. 2015). The public sector is currently being transformed from a legal authority and a service provider to an arena of co-creation (Torfing et al. 2016), implying the definition of novel practices for public service delivery (European Commission 2011).

In this paper, we describe migrants' social integration research, design and experimentation activities carried out in the European research and development project REBUILD. Funded by the EC Horizon 2020 program, REBUILD aims to design and deliver a series of Information and Communication Technologies (ICT)-based solutions. REBUILD integrates a user-centered, iterative and participatory design approach for adequately responding to new citizens' needs, ethical and intercultural dimensions, and to monitor and validate the socio-economic impact of the Artificial Intelligence (AI)-based Digital Companion. The aim of the project is to improve intelligent matching with available services, the smart support for services access provided to migrants and refugees, and the quality of the life of migrants themselves.

In the first year of the project we defined, through co-design activities and co-creation practices involving both user targets (migrants, refugees) and local service providers, the user requirements, the design guidelines and the information flows of the Digital Companion through artificial intelligence models. The main objective is to facilitate access to information for migrants and refugees about all the services offered to them by the host countries, and therefore to facilitate their integration process in the host countries. REBUILD also developed an LSP Dashboard allowing service providers to better understand migrants and refugees to whom their services are addressed in a more widespread and analytical way, by tracking and integrating service and user interaction data.

The REBUILD digital companion offers smart support for migrants by enabling personalized two-way communication using the intelligent chatbot to provide them information about available public services. The REBUILD smart support is designed to effectively access and interact with those services and with the local context of service providers along three different perspectives:

1. Informative support, by providing contextualized and rich information to the end-users;
2. Functional support, by accompanying the end-users in accomplishing their operational tasks;
3. Intelligent support, by enacting empowering strategies in order to let the end-users gain autonomy, self-efficacy and trust.

This paper focuses in particular on analyzing and presenting the theoretical approaches, methodologies, techniques and results developed and implemented in the project. We firstly introduce participation and co-creation for social integration, describing the conceptual framework adopted to implement the co-creation practices of workshops and participatory design involving migrants and service providers.

Then, we present the design experiments and the iterative co-creation practices in the REBUILD project and describe how the methodology has been applied in the three pilot countries.

Finally, we present the results of the co-creation activities and discuss the main findings from a design perspective.

2. Participatory Design with Vulnerable People

The practice of collective creativity in design has been around for nearly 40 years, going under the name of participatory design (Stembert 2017; Halskov and Brodersen 2015). In the 1970s, the Collective Resource Approach, a Scandinavian approach to the design, was established to increase the value of workers' engagement in the development of new systems for the workplace. This approach brought the designers/researchers (experts of the systems) and the end-users to work together, to build on their own experiences and provide them with relevant and useful resources (Bødker 1996; Binder et al. 2011) through four key elements: cooperation, experimentation, contextualization, and iteration.

The participatory design (PD) approach has already been used in different scenarios involving vulnerable people, ranging from elderly people involved in healthcare projects to marginalized young adults involved in education and citizen engagement projects. REBUILD considered PD in this context due to its high potential for enabling users to be active contributors during the development of computer-related products and activities (Greenbaum 1991; Muller and Druin 2012). PD promotes the empowerment of users (Hussain 2010) and their role as design partners for designing systems while building a connection and promoting active work among its targeted population group and its developers (Duarte et al. 2018). Iterative actions in PD are required to achieve a final design of an artefact that addresses participants' requirements and ideas. An in-depth understanding of end-user experience can only be obtained in the continuity of the events, which build upon each other, and despite occasional deviations, the whole process results in a commonly designed artefact (Joshi and Bratteteig 2016; Duarte et al. 2018; Sanders 1992; Binder et al. 2009).

Participatory processes connect spaces of transition where interpretation, planning, and decision-making happen (Halskov and Brodersen 2015). Moreover, we assume, together with other authors (Joshi and Bratteteig 2016), that PD is an iterative yet incremental process that has different stages: the determination of the use context, the recognition of users' needs and requirements, the establishment of design suggestions, and the experiment with, and the evaluation of, the artefact.

Each of these steps and the related iteration cycles are essential for all the stakeholders to understand the design process and see its evolution. When the participants in the design project have different backgrounds and come from different professional contexts, a problem of communication among different stakeholders may arise. More recently Maarten Pieters and Stefanie Jansen pointed out the value of co-creation as a "transparent process of value creation in ongoing, productive collaboration with, and supported by all relevant parties, with end-users playing a central role" (Pieters and Jansen 2017, p. 15).

Participatory design has been instrumental with vulnerable people in also uncovering hidden assumptions and misconceptions about use and users, in particular for those people with a difficulty in making them explicit. Even formal approaches in design, such as the Design Methods movement, became essential to introduce new kinds of representations in order to open up the design process for collaboration and external participation (e.g., Alexander 1984; Jones 1992).

It must be noted that, especially in the *Third Wave* of HCI projects (Bodker 2006), non-worker people, such as young and elderly users, as well as migrants, are fascinated by seeing the participatory design activities as a technology-development process that

can result in a personal empowerment: acquiring skills related to software development (Duarte et al. 2018).

3. Iterative Experimentation Process and Methodology

This section highlights the two main phases of the participatory and co-creation methodology described above, where iterative activities have been carried out aiming at accomplishing the four main stages of PD: the determination of the use context, the recognition of users' needs and requirements, the establishment of design suggestions, the experiment with and the evaluation of the artefact. Figure 1 shows the process.
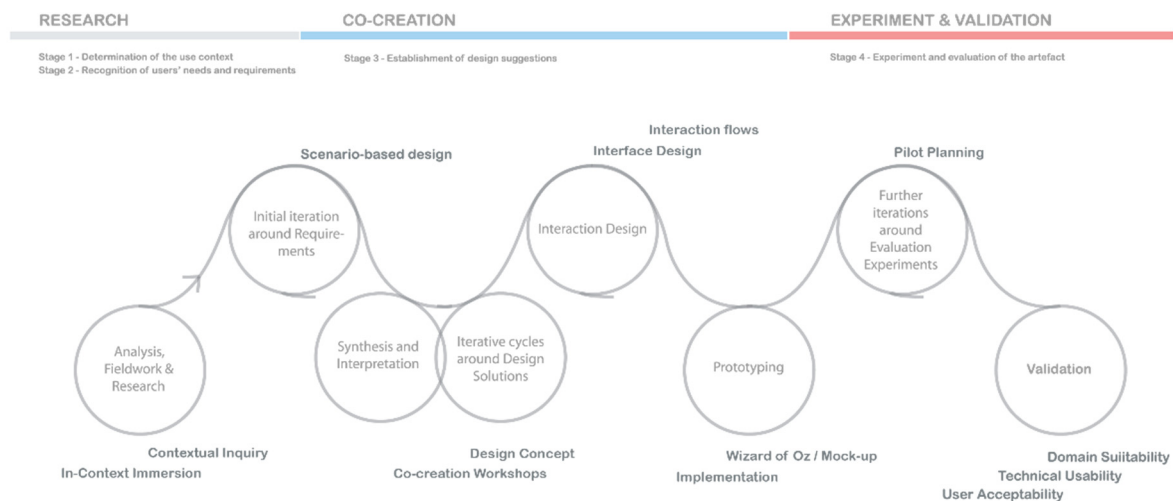

Figure 1. The cooperative, experimental, contextualized and iterative design process highlighting on PD stages and the co-creation activities.

3.1. First Phase: Co-Creation Workshops

The REBUILD project, implemented in three country clusters (Italy, Spain and Greece) has the ambition of properly addressing real target users' needs, ethical and cross-cultural dimensions, and of monitoring and validating the socio-economic impacts of the proposed solution. Both target groups (immigrants/refugees and local public service providers) are part of a continuous design process which includes the gathering of their feedback and suggestions to inform the development process, with the aim of creating and maintaining their engagement throughout and after the project timeline.

The capacity to engage relevant stakeholders external to the project is a key factor in the three main piloting countries: Italy, Spain and Greece, chosen due to their geographic situation, i.e., crucial points with regard to the main immigration routes. The first phase of the project engaged users and stakeholders in the design of the REBUILD system application by means of Co-Creation Workshops organized in each of the countries. The research and co-design activities of the first phase of the project allowed to highlight on the user experience of both migrants and local service providers. The results of Co-creation Workshops were systematized and developed by a multidisciplinary research team and were used to support the selection of technologies, the design of user interactions and application logics, and the actual application development.

The REBUILD system is composed of a mobile application for migrant/refugee users and a web-based Dashboard for local service providers. As said, such a platform was designed through an iterative development process that allows it to evolve in step with user needs and to track deviations from requirements. Such iterative prototyping of solutions follows a logic of continuous development and reporting, which allows the REBUILD system to be constantly improved based on continuous user feedback, to allocate the right resources, and to result in services that are not far from the end-user as they are designed, tested and validated by them.

Such cooperative, experimental, contextualized, and iterative design approaches proved to be particularly valuable for the development of AI-based solutions. Not depending on the user's level of computer literacy, or their understanding of a language, or knowledge of a territory, the REBUILD system aims to eliminate of eventual inequalities in the use of AI-based services. The final objective is to ensure that this technological platform can be used by all without discrimination while recognizing the diversity of each individual. This approach allowed respecting equity in diversity, a vision on which the REBUILD project bases its results from both a methodological and a technological point of view. Moreover, in order to avoid possible biases in AI-based technology design causing marginalization, migrants and their needs were at the center of the design process throughout all the design phases.

The Experiment and Validation phase, conducted in March and April 2021, has seen the involvement of all consortium partners in experimenting, assessing, and validating their respective service scenarios to provide essential feedback to the technical development.

Focus on Scenario-Based Service Design

During the first phase of the Co-creation Workshop, a set of scenarios addressing REBUILD service and user experience were produced on the basis of the requirements for the three pilot countries. The use of scenarios (Carroll 1995, 2000) allowed to structure data gathered through activity analysis while envisioning the role and functionalities of the REBUILD system and assessing and validating the envisioned solutions from a technical perspective. In this way, scenarios worked as a design tool along the overall design process (Kankainen et al. 2012).

Participatory approaches to system design have been enriched over the years by ethnographic methods geared directly to supporting user practices with respect to using technology simply to automate their tasks. In addition, we have tried to make users participate democratically in the design process, making sure that they know better than anyone else what they need. We used scenarios (Carroll 1995, 2000) in our design process to help elicit and structure data from activity analysis, the envisioning of roles and functionalities of the intelligent Chatbot, and the assessment and validation of the envisioned solutions.

The plot of a scenario unfolds when the actor starts to perform activities aimed at achieving his or her goal, when the product responds to these actions and/or when outside events (changes in the setting) trigger or interrupt the interaction between the actor and the product.

Scenarios represent the tool used to develop a consistent user experience across the diversity of the different REBUILD software services and contexts of use. In particular, the scenarios present design concepts to seamlessly support the users in moving across different domains such as language and culture, social integration and job seeking. The narratives developed are envisioning scenarios, meaning that the most useful and viable scenarios envisioned are available to represent the characteristics and role of the future system.

The REBUILD scenarios detail interaction paths with the objective to allow the refinement of the interaction modalities and the technical features of the REBUILD application prototype. Scenarios thus represent the detailed mapping of the workings of a given "service" explicating the link between the actual service provision flow (the way the service is actually provided in the real world), and the actors involved in the service provisions (the providers, the receivers and any middle-man, third party or external precondition conducive to the service provision or affecting the service delivery or enjoyment).

As a consequence, the consortium prioritized inputs and development on specific REBUILD services:

- Support to Job Seeking (Italy);
- Support to Training Seeking (Italy);
- Access to National Health System (Italy);
- Access to National Health System (Greece);

- Access to Social Mentoring (Spain).

Beyond accessing these scenarios, the validation included the functioning of basic system components on both the App and Dashboard sides, such as user registration, user login, profiling, etc. Specific test scenarios for the REBUILD mobile app generic functions, such as registration, login, menus, etc., were also developed and provided to all the test teams. The implementation of both test and service-specific scenarios was inspired by the REBUILD App user interface design developed, taking into account the following user requirements:

- Content management accessibility (multilingual interface, pictograms, animations as accessibility gateways);
- Reliable guidance to the users throughout the different scenarios;
- Ad-hoc interface for service providers for accessing backend through a web-based Dashboard,
- Application services (e.g., data entry and communication).

The development of the user interface design concept allowed us to visualize the logical organization of content and service components, shaping how the App would guide the user through the scenarios. Both the user interface design and the visual narratives applied to scenario-based service design allowed to display the migrants and refugees' step-by-step journey in a concise, understandable, and shareable narrative. Even though all the participants involved came from different countries and spoke different languages, through the visual representation of the interaction they were able to understand, discuss and revise the intelligent Chatbot services in order to clearly highlight problems, opportunities and what is most valuable in a service.

3.2. Second Phase: Experiment and Validation

The Experiment and Validation phase of the project required the consortium partners to participate in testing the core functionality of the REBUILD system, for the purposes of providing early feedback and soliciting the expectations of the group. This feedback is then expected to be translated into actions for the future development of the system.

The testing and experiment activity aims at validating the concepts of the App and Dashboard operational approach, with relation to the structure of domains and services, and according to three main validation criteria:

- *Domain Suitability* of the proposed services and content of information, of the display representation and system functionalities. Including adherence to LSP work-practices and internal procedures and migrant journeys;
- *Technical Usability* of the system, meaning the property of a tool to be effectively used, understood and learned by the people for which it has been designed, including look and feel aspects of the prototypes of the App and the Dashboard;
- *User Acceptability* of the proposed system, meaning the ease of use and suitability of the system for supporting cognitive task requirements, job satisfaction and acceptability, the perceived usefulness, efficacy, and usability for both services beneficiaries and services providers.

The REBUILD validation approach aims to demonstrate how a system, a methodology or an operational procedure can function in real life conditions with the required level of performance, security, and operability.

Operational Validation can also be defined as the process of answering the question, "Are we building the right system?" in addition to the Technical Validation and Verification that deals with answering the question, "Are we building the system right?".

The main goal of the validation process in REBUILD is to conduct an evaluation of the platform to determine the appropriateness of the applicative scenarios selected in the project. Thus, validation relates both to the identification of the operational needs of the stakeholders and to the establishment of appropriate solutions to the problems and issues identified. A validation process is itself an iterative process that ensures the needs are

properly understood, the solution is well adapted and adequate supporting evidence has been gathered.

The Experiment and Validation activities were organized by pairing technical and design team members in order to demonstrate each functionality and to provide support where needed. The test protocol foresaw to follow the REBUILD functional scenarios in order to validate whether the Minimum Viable Product (MVP) status is achieved. A Minimum Viable Product is a version of a product with just enough features to be usable by early users who can then provide feedback for future product development. The MVP methodology potentially avoids lengthy and unnecessary work: with an MVP, developers work on iterative versions of the product and respond to feedback, challenging and validating assumptions about the product's requirements.

The REBUILD MVP was collectively discussed and decided upon by the consortium partners, taking into consideration both the advancements of service descriptions and their technical implementations.

Focus on Experimental Protocol

Test use cases were prepared on the basis of service scenarios and user requirements (Bhasin et al. 2014). Four distinct phases were identified and recommended to conduct the test:

- Identification of and engagement with testers;
- Test phase start up (including through on-site events);
- Feedback gathering;
- Analysis of the results.

Based on the service scenarios that were implemented at that stage of the project, namely, Job seeking, Healthcare, Education and Social mentoring, the target partners for testing were CIDAS, OMNES, MDAT, UAB and UNINETTUNO, with the App testing scenarios (see Figure 2 for details) being shared with all the involved users and service scenarios shared with specific teams that were to conduct tests.
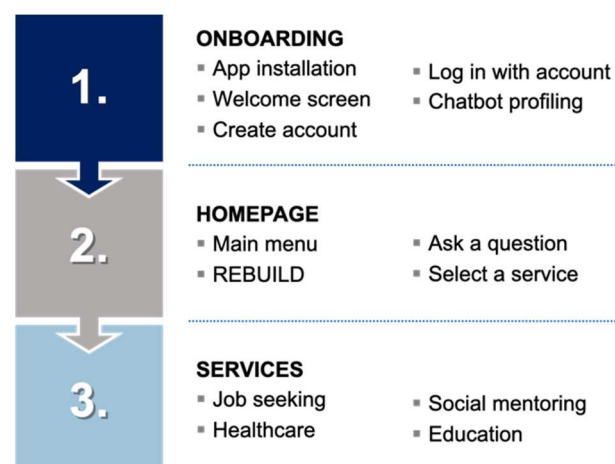

Figure 2. Sequence of App testing scenarios for all testing groups.

Introductory sessions were scheduled and conducted with all the concerned test partners to set context, explain the activity timelines, and address early questions. In particular, the introductory sessions were addressed for the test partners to complete users' profiling according to the following criteria:

Users

- At least 2 different ethnicities;
- Literate, as text input is required;
- Expectations set to users to be as honest as possible, and reassured that the information provided will only be used for the purposes of the test;

- Pre-vetted for the physical safety of the other testers and coordinators.

  Devices

- Android version;
- Mobile Manufacturer and Model;
- Service provider.

  Data

- Limit tests to the testing group identified;
- Respect data entry fields length, whenever expected.

  Timeline

- It is recommended that the exercise be completed in one sitting;
- Can be conducted in groups or individually.

4. Discussion on the Experiments' Results

The overall Experiment and Validation phase that was carried out in the REBUILD project highlights a set of issues of conceptual, design-related and system development nature, to be taken into account in the following project implementation activities. In particular the results of the experiment will allow to prepare the Toolbox for the upcoming phase of extensive Pilot Studies. This section summarizes the major results.

Purpose of the App. In general, the test showed a good degree of user acceptance, and allowed the collection of a number of important remarks and suggestions. In particular, the results show that the design and implementation of the App and the Dashboard need improvement regarding:

- The communication on the scope of the tools;
- The added value of the tool to the users' needs (in the different domains).

In fact, notwithstanding the presence and the guidance of the researchers during all test sessions and the provision of explanatory videos, several migrants reported difficulties in immediately grasping the purpose of the App. Furthermore, according to feedback, the profiling phase does not facilitate the entry into the experience of REBUILD services.

The provision of REBUILD services requires and is based on the collection of user profile information, in order to offer a personalized experience as well as personalized user interface adaptation. However, the current monolithic implementation of the profiling conversation seems to fragment user control and understanding of the App purpose.

From the outset, the App should then immediately make clear its purposes, its service offering, and communicate its added value in bringing informative support to the migrants in the different domains. At the moment, users seem to not easily focus on the App's main features:

- General information provision;
- Service-specific information provision;
- The ability of supporting user reflection upon its own condition and needs.

The heterogeneity of the proposed domains does not likely make clearly understandable the 'role' of the App.

Migrants are today used to highly sociable, responsive and proactive services through social media integration and sociality in a variety of shapes (e.g., groups and communities), timely responses and push notifications. It seems that a predominantly functional perspective of the App design might impact on adoption and on the attitude towards the product. Indeed, it seems to both affect the use and adoption as well as users' availability to promote and suggest the use of the services.

Digital Companion Agent. The (Chatbot) conversation method is a valid and extensively appreciated method since it may offer the possibility to engage in an interactive surveying service. At the same time, a conversation becomes valuable, durable, engaging, and efficient when conducted by an 'agent' with a well-constructed companion identity.

The rule-based predefined conversation tree method, while offering a high degree of control over the information collection and predictable exchanges with the users, needs to be complemented with the design of a stable and consistent agent identity.

However, the design and implementation of the agent identity and conversational abilities are confronted to a multi-layered challenge:

- Literacy: how to promote and conduct conversations with illiterate users, where text is uncertain and scarcely understood and pictograms are the main resource for feeding the interaction;
- Rich interaction: how to build a proactive, meaningful, and enduring relationship (App-user) which is able to encompass the pure functional level;
- Sensitive interaction: how to design the interaction in order to respect diversity, and to not hurt anyone while directly or indirectly asking for personal, intimate and sensitive information (e.g., personal issues and needs, with relation to abuse, violence).

In the current implementation of the App, the (Chatbot) conversation is offered as the prevalent method of interaction. The visual building-block questions interface is, on the other hand, proposed or perceived as a secondary method for user interaction, and its potential has not been fully exploited. Additionally, the fact that these ways of interaction do co-exist is not made well explicit nor understandable. As a consequence, the REBUILD button, conceptually meant to be the access point to all App functions, was not easily understood, nor adopted by the users.

Current conversation trees would also require a strong revision and further elaboration into shorter, easier, more manageable, micro-interactions where the block of conversations may be dynamically activated or selected by the users, according to their profiles and previous answers.

Such modular conversation blocks could then offer proactive suggestions and trigger user action, thus enhancing their experience with REBUILD.

Access to the App. Experiment and Validation demonstrated the impact of some aspects of the current design/implementation which are preventing service access and informative support provision.

On one hand there are some technological issues to be taken into account and barriers to be removed, such as the availability of the REBUILD App for old mobile phone operating systems, e.g., Android 6.0.

In this regard, the Experiment and Validation phase highlighted that the App should be:

- Available: easily accessible from stores via a direct search but also with other means, such as paper-print QR code dissemination in order to facilitate download;
- Robust and compatible: ensure a fully functioning experience even on older systems;
- Scalable: capable of adapting certain contents' provision according to available resources, i.e., replace the explanatory videos with short descriptive text when videos would decrease end-users' mobile phone performance.

On the other hand, the conversation modality described above frequently insists on long sequences of text questions/answers. An App design revision should focus on the mitigation of this text-prevalent approach in favour of a smarter way of informative support provision, such as the use of direct select options to shorten conversation exchanges. The use of pictograms needs to be improved and their role emphasized in the user experience overall.

5. Lessons Learned on Participatory Design and Co-Creation

This section discusses the lessons learned regarding the improvement and the impact of participatory design, especially with relation to co-creation and co-production.

Understand migrants' and refugees' life as a prerequisite for participation. Knowledge on the social background and the migration journey is a key issue for preparing successful participatory design processes. Flexibility, agility and modularity needs to be

included as qualities of the co-design approach intending to focus on migrants' dynamic and evolving condition.

Furthermore, speaking about "migrants" tends to be a simplification of a complex group of people, including both migrants already in an integration process, with ambitions of social integration depending on their capacity to access to the labor market and the capacity of the host society itself. Additionally, the newly arrived or those in an irregular administrative situation, who are seeking to satisfy basic needs such as accommodation and food, and (legal aid in) regularizing their status. Therefore, service design and strategies cannot aim at a "one size fits all" solution because peoples' conditions are different and diverse.

Address specific needs and challenges in a wider perspective. Projects and initiatives focusing on migrants' integration are often designed and implemented along mono-causal assumptions, undermining the overall effectiveness of any solution, and their actual mid- and long-term sustainability.

The initiatives cannot address only separate groups, but should involve the entire local community, including citizens, Public Authorities, civil society, and other minorities. Given that all the sectors in society have diverse expectations and needs, solutions for integration might scale up and diversify accordingly. Large and extensive projects would also imply to consider time scalability in order to observe value, attitude and behavior changes over time.

Remove barriers to participation first. Barriers to participation of migrants needs to be reduced as much as possible. We recommend not to underestimate the cultural differences in conceiving participation of migrants on one side, and local service providers on the other. There might be barriers to participation, such as linguistic, technological, and cultural, as well as pragmatic and ordinary barriers that dictate actions beyond the provision of mobility and transportation fee in order to reach the research or project activity sites.

Illiteracy and its impact on digital capabilities of migrant users need to be taken into account, promoting alternative, visually rich modalities of communication and participation in the participatory design activities.

Pushing participatory design ahead. The current challenge of participation and engagement requires us to innovate the participatory design framework, at both at the theoretical and methodological levels. Traditional approaches to collaboratively design future solutions with the users and bring their knowledge to the application might no longer be sufficient for the complex nature of our societies.

Recently, many initiatives have been established at different levels of governance—often in the form of Public Sector Innovation (PSI) and policy labs—focusing on experimenting with new policy formulation and implementation practices, both directly and indirectly through service innovation. Service and policy innovations are in fact tightly interconnected: policies may also be seen as the umbrella under which societal value can be built and more effective services delivered. Services are on one hand influenced by policies and on the other hand are themselves policies that have been put into operations. This is one of the reasons behind the experimentation of service design methods and tools for the design of policies.

Policy labs are experimenting with these methods and tools in a variety of places and situations (Tõnurist et al. 2017; McGann et al. 2018), conducting small-scale experiments in diverse sectors and facing the problem of connecting innovation activities on the ground with the transformation of policies and policy-making processes. The development of policy lab for the public sector innovation represents a relevant step toward the development of a culture of innovation focused on citizens' needs. The risk of implementing these dedicated structures outside the core areas of public administrations may lead to new silos, with the largest portion of civil servants working on delivering services as usual and only a small part of them focusing on developing user-centric innovation and the corresponding culture.

6. Conclusions

The current crisis of participation and crisis of engagement of Western societies also affects the application and the validity of the participatory design methodology. Traditional techniques to collaboratively design future solutions with the users might no longer be sufficient for the complex nature of our societies. The innovation of the participatory design framework, at the theoretical and methodological level, is especially required in order to turn participation into action, to go beyond the mere public consultation and to find new pathways for involving all the citizens (not only migrants, not only LSP) as a first step to build a successful project. Together with mutual learning, two major issues arose in participatory design: equalization of power relations and co-realization (Bratteteig et al. 2013).

Although participatory design has been inspired by altruistic design that seeks to reduce influence (Keshavarz and Mazé 2013), this view seems problematic in reality. People participation is mediated by power struggles since the intervention of the experts/designers in these communities is still a form of domination. A main concern is to allow all the participants to have a say in an equal way during the collaborative process and to avoid applying a paternalistic approach (Thorpe and Gamman 2011). A regenerative governance framework (Axinte et al. 2019), with a more fraternal approach, could be a potential approach for considering migrants as sources of inspiration to instill novelty and solutions in Western societal challenges.

Co-creation or co-production might be considered an important aspect of participatory design as a practice to give users agency to advocate, act, and create their own desirable situations in a more impartial and equitable way. The co-creation practiced at the early front end of the REBUILD design development process is expected to have an impact with positive, long-range consequences. It is expected that such application of co-creation design practices (both at the moment of idea generation and continuing throughout the design process at all key moments of decision-making) to very large-scale problems will change the way technologies are designed and developed, especially in the case of migrants' social integration (Sanders and Stappers 2008; Finland Futures Research Centre & Turku School of Economics 2014). Adopting co-design approaches allowed collecting and identifying the perspectives of a multitude of stakeholders, building shared solutions and finding the way to involve at the same time local populations and migrants and refugees as novel residents.

Furthermore, co-design aims for integration instead of separation, and does that by means of cooperation between migrants and local communities. Cooperation also means to eliminate the distrust and foster acceptance of the society, and this could only be done via a transparent proposition and clear objectives and values.

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