

Focussing on Humanistic Outcomes on the Sociotechnical Axis of Cohesion of the IS Discipline: User Participation in Distributed Participatory Design

Karlheinz Kautz

RMIT University

Melbourne, Australia

Karlheinz.kautz@rmit.edu.au

Gro Bjercknes

Monash University

Melbourne, Australia

gro.bjercknes@monash.edu

Abstract

Following a recent plea to recommit to the sociotechnical perspective as a foundation of the IS discipline by connecting instrumental and humanistic outcomes, we present a study of user participation in distributed participatory design, which was initiated by UNICEF and executed largely by youth to develop a digital game to raise attention about climate change. We apply an integrative framework for user participation, which consists of well-established concepts and show that it can be fruitfully used in a new context. We found genuine user participation carried out by the adolescents. The user participation had a focus on individual users and the form of direct and indirect participation, where the juvenile participants took informative and consultative roles. The project resulted both in functional and democratic empowerment, and as such represents an instance of information systems development and research, which emphasises a humanistic orientation and outcome while not neglecting any instrumental outcomes.

Keywords: Distributed participatory design, user participation, case study research.

1. Introduction

Recently a plea has been put forward to recommit to the sociotechnical perspective as a foundation of the Information Systems (IS) discipline by synergistically connecting instrumental results such as efficiency, effectiveness, productivity and, we might add, profitability, which usually dominate IS research in business and commercial contexts, with humanistic outcomes such as well-being, equality, and freedom [36]. The authors refer to the sociotechnical perspective as the axis of cohesion, the shared frame that provides the discipline with common language, broadly accepted research orientation(s), and/or communal knowledge in the form of shared assumptions and interests.

Distributed participatory design (DPD) is an approach to information systems development (ISD) which prioritizes humanistic outcomes while not neglecting instrumental ones. It has its roots in participatory design (PD), which is an ISD and design methodology. Participation of people, users, as equal design partners in the co-design of the information systems and technologies (IS/IT) that they are supposed to use themselves, is a central tenet in PD [23], [27]. It originally developed in the 1970s in Scandinavia with a strong emphasis on the political aspects of technology design and on empowering and emancipating workers at the work place [35], [18]. It focused on user participation in internal organizational settings in the development of dedicated, tailor-made IS/IT. Thus, most studies of PD examine the development of a single, customised information system that typically supports workflows within a single client organization [33].

Recent PD considers non-organizational, community-driven, open contexts [27]. Participation by less formally organized communities and by the crowd in e.g., the development of open-source software systems and content producing community-based service systems –

also called commons-based peer production [2] - has challenged existing ISD and PD approaches [27], [34], [23], [11]. To cope with these new contexts and forms of work and participation – such as communities and virtual networks – traditional PD expanded to deal with the diversification of stakeholders and to cope with settings where stakeholders are distributed across various dimensions of time, space and organizational structures [33]. With a focus on communities, [11] use the concept of community-based participatory design to discuss some of the new forms of participatory design. The concept of distributed participatory design (DPD) refers to the participation of different stakeholders in distributed design teams, mostly online, through Internet, web-based, and social media platforms where user participation in online projects is primarily voluntary and the participants are typically unaffiliated with the development organization [27].

Much of the research on DPD has been performed as a form of action research and focusses on individual techniques, methods, and organizational structures [27], [33], [37], but little emphasis has been put on the actual user participation in terms of focus, form, purpose of, and user roles in user participation in DPD. Markus and Mao [29] encourage to extend research on participatory approaches to ISD beyond conventional settings, roles and types of participants and contributors. We are interested in how user participation in DPD projects is performed and managed without the intervention of researchers. In particular for the research reported here we pose the question: how do potential users participate in DPD activities in practice? To answer this research question, we studied a case of DPD in the context of an UNICEF (Pacific Islands Countries) initiated project.

The United Nations Children's Fund (UNICEF) is a United Nations (UN) international, intergovernmental, non-for-profit organization and program that provides humanitarian and development assistance to children and mothers in developing countries. For UNICEF it is vital that their information reaches as many people as possible. UNICEF (P), short for UNICEF (Pacific Islands Countries), a UNICEF chapter, has recognized social media's value particularly for distributing important information on matters such as health, emergencies, education and climate change [39]. Engaging youth is a key focus for UNICEF (P). UNICEF (P) were challenged by Pacific Islander (PI) youth, who were not contributing significantly to, or engaging with, content shared on UNICEF (P)'s Facebook (FB) fan page, to be 'younger and less boring' in using social media. Thus, to explore the abilities of digital technologies to involve and empower youth to influence decision making affecting their own lives, UNICEF (P) invited and engaged PI youth in participating in different roles in the development of an information system, a FB-based game to be called 'Pacific Climate Change Challenge Game' (PC3G), which had the objective to raise awareness about climate change challenges in that region [12].

The remainder of this article is structured as follows: the next section includes a review of related research publications and the theoretical background for the study, which comprises an integrated framework based on common concepts of user participation. We then introduce our research method and provide the setting of our study in the form of a case narrative, present our analysis and discuss our findings and finish with some conclusions.

2. Related Work and Theoretical Background

Our literature search of DPD literature only led to few contributions and none directly related to a conceptualization of the notion of user and their participation in DPD activities.

In some foundational work Gumm [14] provides a taxonomy of dimensions of distribution and distinguishes between physical, organizational, temporal distribution. She also presents 5 practices, mediated feedback, inter-contextual user workshops, commented case studies, surveys, and user support to resolve the challenges of DPD with regard to project management, coordination, and communication [15], [33]. The practices were derived from action research during the development of an open source, web-based groupware system which was originally built for the education sector in Germany. Titlestad et al. [37] also explore the challenges to distributed participation, in their case in the context of a long term action research project of designing and implementing health information systems in the Global South, within and across countries. To cope with distribution and to balance global efforts and local needs they highlight the role of the circulation of people, artefacts, and standards in network structures, which are

facilitated by mediators, and the co-coordination and co-evolution of a globally designed standardized core toolbox and local innovations and solutions.

Lukyanenko et al. [27] focus on ways to engage online users in the development and design of IS that harness user generated content and report from two citizen science projects, one on mapping regional biodiversity and one on transcribing weather records. They provide a description of DPD activities and approaches such as discussion boards, workshops, interviews, and prototyping. On this basis they identify a number of challenges and a research agenda for the development of IS that support the generation of user content. In particular, they identify the organization of decision making and the management of user participation as significant issues. In this context, they refer to concepts such as representative user, idealized user, and the general term of user role, but do not further detail them. Rather like Löwgren and Stolterman's [28] conceptualization of user participation in core users – those involved in the project, periphery – those not actively participating, and context – the surrounding society and environment, which they mention, they dismiss this framing for their purposes.

Kazman and Chen [23] propose a similar distinction in their work on the development of crowdsourced systems, although they do not explicitly mention the concept of DPD. They distinguish between kernel, periphery, and masses for participant roles with e.g. the kernel consisting of (functional and technical) architects, business or product owners and core developers, the periphery comprising among others further developers, prosumers (producers, who are also consumers) and other stakeholders, and examples for the masses being customers and end users. They provide a set of practical management and development principles and implications for this type of distributed projects, but no further conceptual grounding of any user participation.

Näkki and Koskela-Huotari [32] report on an action research project where a group of distributed users participated in the process of designing a new online service. Their work has been influenced by Markus and Mao [29], who conceptualize those involved in user participation as stakeholders including actual participants, and as change agents. Näkki and Koskela-Huotari [32] distinguish between participants, users and facilitators. Although touching upon roles of users, as well as forms and purpose of participation, they focus on participation activities and social media's impact on these activities and discuss the extent to which participation took place online in the idea generation, concept design and prototyping activities of the project. In detail they report and reflect upon how the users were involved in providing and commenting probe blog as well as discussing and voting on ideas; posting user stories, prioritizing features, designing user interfaces as well as voting on design concepts; and finally testing, discussing and commenting demo versions reporting errors.

Based on their review of the publications focussing on the concept of distribution, Loebbecke and Powell [26] conclude that such good practice developments as listed above are a start for the practical solutions to the problems of distribution in PD, but express a need for further theoretical underpinnings for DPD. Warr [41] emphasises the significance of the situated nature of each participant's circumstances while creating a common space for participation. He also argues that the distinction between collocated or distributed participatory design is misleading as most projects have elements of both. We thus see a further need for conceptualization of the notion of user in user participation. On this background we revisit the literature on PD for a framework to understand and study user participation in DPD.

3. A Framework for Analysing User Participation in DPD

To study DPD and within the design activities more precisely user participation we turn to the work of Iivari and Iivari [19] and apply the concept of user focus that was originally introduced by these authors. The concept designates the types of users, which the DPD activities will focus on; . Iivari and Iivari [19] distinguish between individual, average and fictive user focus: With an individual focus emphasis is put on each individual, potential user's needs and capabilities and attempts are made to include and satisfy each possible, actual user. With a focus on an average user habitually some heuristics or general design principles are applied. Focusing on a fictive user the design proposals are typically based on personas, which are descriptions of hypothetical archetypes of actual users. Keeping in mind that these concepts originated in a workplace context our further analysis will then be based on the following constitutive concepts

of user participation: 1) user roles in user participation, 2) forms of participation and 3) purpose of user participation as presented in [10], [31], [7], respectively.

Damodaran [10] differentiates three user roles in the design and development process. The user can play an informative, consultative or participative role. As informants, users merely provide information about their - work - activities and might be the objects of some observation. In a consultative role they are asked to comment on pre-set design solutions. In a participative role they actively participate in the design process and have decision making power regarding the solution.

Mumford [31] further classifies two different forms of participation, namely direct and indirect user participation, where the user is represented by some kind of intermediary. Direct and indirect participation are defined through the users' direct participation in the project (team) or their direct or indirect contact with project staff from the development organization. Iivari and Iivari [19] additionally distinguish representative and surrogate representation as two indirect forms of user participation.

Clement [7] argues that the purpose of user participation is empowerment and distinguishes between functional empowerment and democratic empowerment. The former means that the users should be able to carry out their activities to their own satisfaction and in an effective, efficient and, if desired or necessary, economical manner. Their participation in the design process supports to reach this objective. Democratic empowerment means that they should have the mandate to participate in decision making regarding the design and development of software and IT-based systems.

Table 1: Integrated framework for user participation

User Focus	Individual User Average User Fictive User
Roles of participating Stakeholder	Informative Role Consultative Role Participatory Role
Forms of Participation	Direct Participation Indirect Participation (representative or surrogate)
Purpose of Participation	Functional Empowerment Democratic Empowerment

The participatory design literature has traditionally advocated workplace democracy, a participative role for the users, and direct participation [4], while in large parts of the IS literature, functional empowerment with users in informative or consultative roles, directly or indirectly involved, has been the focus of research [24]. The concepts have separately been used to study user participation in open source software development [20]. Here we will use them together to study user participation in DPD; Table 1 summarizes this integrated framework of user participation which we apply for our analysis.

4. Research Approach and Method

This research is interpretive. Given the limited literature concerning our research topic, understanding user participation in DPD, our investigation is based on an exploratory, qualitative, single case study [9] of an ISD project, which involves a number of different organizational units and stakeholder groups. In contrast to most other research on DPD, our research presents an ex post, empirical case study of actual practice with no direct influence by the research team and authors of this paper on the course of the project. While it is often stated that it is not possible to theorize and certainly not to generalize from a single case study, [40] suggests that it is possible to generalize case study findings among others in the form of a contribution of rich insight. On this background we used the concepts included in the integrated framework for user participation for our data analysis.

Access to the case organization was critical to our exploration and was provided directly by two key informants. The first informant had been involved in the project as a representative of UNICEF (P) and communications specialist. He was the project sponsor and the project co-coordinator in the development of the game at all project stages, we will refer to him as the project sponsor or the sponsor. He shared email correspondence and all relevant documents and

provided reflections on the process. The second key informant also participated during the whole project as a consultant and facilitator. She brought her distinct IS expertise on the interplay between people, processes, information and digital technologies to the project. As such she impacted the design and development of the game. The two authors conducted interviews with the key informants and had access to the record of the project debriefing, which the consultant had held with the members of the technical development team, all concerning their respective roles and experience during the project. All interviews lasted about 1 hour.

Given the distributed location of the participants the extensive email trail between the different participants was the main data source. Lee [25] argues that email communication can provide a rich understanding of what has occurred. Emails included those from and between the sponsor, the consultant, the members of the technical development team, three testers, four adolescent social media facilitators, as well as email correspondence from UNICEF including headquarter staff in New York, climate change experts and learning experts from the Commonwealth of Learning (COL) (<https://thecommonwealth.org/commonwealth-learning>), an intergovernmental organization that provided advice and some funding. These emails contained status information, reflections before, during and after the development and implementation of the game, conceptual feedback, reflections and recollections concerning input into the design of the game, the elements of climate change it was addressing, test results as well as technical feedback. More detail about the different co-creators, their relationship and their location will be provided in the next section.

The empirical data also comprised social media postings by the four adolescent social media facilitators including an invitation for input and further feedback on the game. This was launched as a FB album. The data furthermore included the initial responses to the request for input as well as the feedback postings that were subsequently received from PI youth. It also encompassed social media activity on the fan page regarding posts after the game's implementation. Finally, project documentation including the UNICEF (P) strategic plan for digital engagement, the COL Terms of Reference for the project, the project description brief and evaluation and the design document produced by the developers outlining the concepts of the game were valuable data sources as were further project notes by the sponsor and the consultant.

Our analysis was guided by the integrated framework. Following with what [30] describe as 'data condensation' we produced a timeline (see Figure 1) spanning the project period and a case narrative, which is included in the following section in a concentrated form. The narrative builds a conceptual model and provides a sequence of events; it also serves as a frame of reference for the analysis and interpretation of the data [13]. Analysing all available empirical material, our understanding of user participation in the PC3G project has come about through an iterative process of interpretation, collaboration, comparison and connecting of prior research and empirical data. During the analysis we regularly discussed our emerging results with the two informants and through their feedback increased the interpretive rigor of our study.

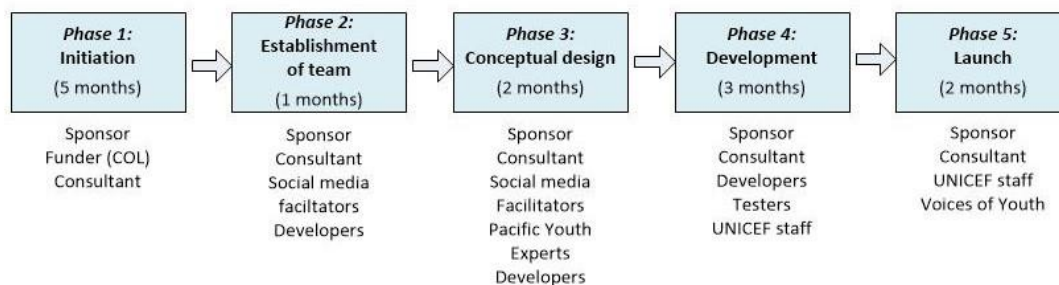


Fig. 1. Timeline, phases, and participants of the PC3G project

5. Case Setting: A Narrative of the Case

With the help of the produced timeline, we identified the following five phases of the project, which subsequently will also be described in more detail: 1 Initiation of the idea and funding; 2 Establishment of the team; 3 Conceptual design of the game; 4 Development of the consolidated game; 5 Launch of the consolidated game.

5.1. Phase 1 – Initiation of the Idea and Funding

As a starting point for a five months initiation phase, based on PI youth critique of the UNICEF(P)'s web site, the communications specialist and project sponsor at UNICEF (P) proposed a project to the organization. He was concerned that although UNICEF (P) had a strong social media presence and was regularly communicating with their audience via social media, two-way interaction was very limited. His major objective was to ensure that PI youth engaged more with UNICEF. His vision was to engage youth through encouraging them to participate in an ISD project via social media. Given the threats posed to small Pacific Islands from climate change the proposal was to develop a digital game, which would also help PI youth to learn more about how to respond to climate change. He put this proposal to COL, which provided modest funding and then approached an IS professor in Melbourne, Australia, who was known to him from a previous collaboration with a request to become a project member as a consultant to help establish, and if necessary, manage a development team and she honorary joined the project in this capacity.

5.2. Phase 2 – Establishment of the Team

The consultant subsequently approached three young research students in her network, who fulfilled the position requirements; these accepted the invitation and were immediately appointed as the developers for a period of 30 working days with an original project runtime of 2 1/2 months. Two of them were Chinese by birth, and one was from Bangladesh. One developer lived in Hong Kong, another in regional Victoria, Australia, and the third member lived in Melbourne. The latter two knew each other, but they did not know the third developer on beforehand, nor did they meet this developer in person during the project. The sponsor's first email to the development team including the consultant described his vision and what he wanted to achieve, the game was not to be about climate change, but how people could respond to the impact of climate change. At the same time, the sponsor identified and contacted four adolescents from Fiji to be social media facilitators for soliciting and gathering ideas from PI youth about the game. The social media facilitators posted a photo with a message inviting input on the game and set this up as a FB album with text encouraging UNICEF (P) FB fans to participate and to contribute to the design of the game. Initial input and comments relating directly to the game came from 16 fans, as well as 15 fans hitting the 'like' button of these postings; subsequently many more fans visited the UNICEF (P) FB page, provided feedback on the game under development, and eventually subscribed to the page (see the descriptions of phases 3 - 5).

During the same period, the consultant facilitated a process among the members of the core development team and the sponsor to agree on the communication protocols between them. The sponsor was happy for the developers to manage the project themselves in terms of the ideas for the game and how the work was undertaken. The developers' first meeting was a telephone conversation about how they would manage the process given they were geographically dispersed. They agreed that they would email each other every couple of days to cater for the quite short timeline for finalising the game. They also planned to use Skype to talk regularly and instant messaging and chat to communicate. Although there was no formal team leader, the student from Bangladesh quickly became the person, who took charge of managing how things would work. At the end of each meeting an email summarizing progress was sent to the sponsor by the informal leader. He reviewed the progress. If he thought there was something that needed to be changed or wanted to provide feedback, he would email the informal leader, or alternatively he called her using Skype. Brief notes were taken from the Skype meetings focusing on any requested changes.

5.3. Phase 3 – Conceptual Design of the Game

The first stage of development was to reach agreement on what the game would be and its look and feel. One of the developers researched relevant aspects of climate change, another looked at different approaches to and types of FB games and the third investigated appropriate technologies, tools and development approaches. As the development of the ideas for the game progressed the sponsor became an intermediary sharing these ideas with experts from the funding organization, international climate change experts and UNICEF staff. Input from these

groups was sought on things such as the direction of the game. Further information on climate change in particular was also provided on a regular basis by the relevant experts to the sponsor. The sponsor provided the feedback including the ideas of the involved PI youth provided through the FB page and facilitated by the four adolescents from Fiji to the developers.

The requirements of the sponsor and ideas of the key stakeholders, PI youth, and UNICEF (P) staff, guided the developers. The team used the following process to decide on their final game: At the very beginning the sponsor asked the developers to think about some ideas, then they collected their ideas to see which of these ideas could be combined. This led to three major ideas; each with a particular focus from one of the developers, which reflected what they individually thought the youth and UNICEF (P) should concentrate on. This resulted in the PC3G consisting of three games in one. Each game was quite different in the way that the players would interact; the CO2 Reducer Challenge requires players to identify potential CO2 emitters; the Evacuate Life Challenge requires players to understand the climate change threats and initiate action, e.g., to evacuate or rebuild before there are serious consequences; the Flood Tales Challenge highlights the causes of floods and the need for flood mitigation. An important design principle was to ensure that each game was not too complicated. The developers found the fan page postings very helpful. The responses from the PI youth had suggested that the game needed to be very interactive, interesting and colourful; it should have graphics, be fun and focused on action, something, which promoted to be positive and to make change.

5.4. Phase 4 – Development of the Consolidated Game

After the developers and the sponsor had agreed on the consolidated game's design, development proper, including detailed design, coding, testing and evaluation could begin. Managing the process, one developer commented: “[The development process proper] was very challenging because we would not face each other and sit together, this was a challenging part.” The development team took an active role in ensuring input in the form of further information and feedback was managed effectively and encouraged further participation by the sponsor, UNICEF staff, and PI youth. As there was no opportunity to discuss, elaborate and clarify ideas and concerns face to face every piece of information and communication had to be very concise. As the team members were working independently and each component of the game was developed separately, several issues concerning the build and layout of the consolidated game arose during this phase. These issues are highlighted in a statement from one of the developers: “The game came in three different formats, totally different interfaces. The developing process of the three people was quite different. It came as three totally different styles of game, different user interface, different colour, a lot of things were different. There was no standard look to the three different games. Fortunately, finally we got this sorted out - the three games now look quite similar”.

The sponsor and UNICEF staff reviewed the first version of the consolidated game and provided feedback; this included the colours, fonts and graphics, the text and help provided with the game. The sponsor highlighted that further work was needed on standardization and how the three components linked together to be one game. He also reinforced the need for the links to further information be embedded in each game.

Technical testing and evaluation were iterative. The developers each first conducted technical unit and system testing to uncover programming errors and ensure user interface consistency. Each developer tested the work of the other two and provided feedback through their regular phone and Skype meetings and email. While the developers tested for programming errors, the game was functionally tested by UNICEF (P) staff that played the game and provided feedback to the sponsor. A technical person within UNICEF also tested the consolidated game and provided technical feedback once the team had incorporated the earlier feedback. Further user evaluation similar to user acceptance testing was undertaken by three friends of the developers in China, who were young and used FB. They played the game and provided advice suggesting that the graphics and artwork needed to be still more attractive. They thought players would be encouraged to play longer if the game was even more interesting. Based on further feedback from their group of peers and their own evaluations, the social media facilitators also provided feedback along these lines, which they both communicated to the sponsor and at times directly to the developers, suggesting the game be

more colourful and easier to play. All feedback was considered, further changes made, and the final version of the game was ultimately accepted by the sponsor.

5.5. Phase 5 – Launch of the Consolidated Game

An email to various international UNICEF groups announced the launch of the game 13 months after its initiation. The game had a favourable reception as many positive comments on what had been achieved were made by UNICEF worldwide, PI youth and FB fans. A media release issued shortly after the launch showed UNICEF's positive assessment of the initiative:

UNICEF Pacific recently tested the use of social media site Facebook.com as a participatory platform for engaging potential champions for children in communication on the topic of climate change in the Pacific. ... when invited to co-create content for the Facebook page, interaction in terms of fans sharing comments, ideas and expressions of interest grew.... Similarly – the number of new subscribing fans to the UNICEF Pacific Facebook more than tripled. Using the social media site for two-way communication with individuals and groups in other words proved more effective to engage with them. [38]

Postings on the UNICEF (P) fan page highlighted how successful the game was with requests for the game to be translated into Pacific languages and a request to include it on the Madagascar UNICEF page. The launch event marked the end of the project for the development team and sparked the developers' pride about their achievement. The consolidated game and was distributed through three FB sites: UNICEF (P), Voices of Youth and Unite for Climate and put into use.

6. Analysis and Discussion

The DPD in the PC3G project can be analysed and discussed from many theoretical perspectives. Such perspectives could be the low degree of IT use, notably of social media, by intergovernmental, non-governmental, not-for-profit organizations [6], [8], their challenges of engagement with youth [17] and of the empowerment of this specific user group [7], markedly through gamification [16], another focus could be to examine the project as an instance of open source software development [37], to take part in the general discourse on crowdsourcing [27] or on the management of crowdsourced ISD for value cocreation [23]. Our focus here however is on the actual user participation in terms of focus, form, purpose of, and roles in DPD.

Our case study investigates genuine DPD initiated by an intergovernmental organization and executed to a large part by mainly youth in a digital game development project. It concentrates on an instance of user participation in DPD in a not-for-profit environment and reveals a complex network of geographically dispersed actors in a transient project organization. Using Gumm's [14] and Kazman and Chen's [23] taxonomy and terminology in Table 2 we provide a summary of the project participants' distribution and their roles. In terms of its objectives the project was considered a success by all involved stakeholders. We identified both the four Fiji adolescents who served as social media facilitators and the involved PI youth who contributed requirements and feedback as ultimate future users of the game. Our integrated framework supports the further analysis and discussion of user participation in DPD.

Following Sarker et al.'s [36] call to recommit to the sociotechnical perspective as the axis of cohesion for research in the IS discipline, we emphasise the humanistic orientation and outcomes while not neglecting the instrumental outcomes of the investigated project.

In the PC3G project the focus was not on any average user nor was it on a fictive user [19]. It was on the actual end users either as individuals or as self-selected individual representatives of a group or as appointed representatives as social media facilitators during the project. Our empirical data show that they had a significant impact on the development and design process and its outcome. It also shows that the chosen focus of user participation was effective in an environment characterized by web technologies and social media as an alternative to using personas as substitutes for representatives of a more general unknown user population [3].

Table 2. Distribution and roles of project participants

Organizational Distribution: Project Participants	Roles	Physical & Temporal Distribution: Locations	Locus of Role
UNICEF Communications Specialist	Project Sponsor & Coordinator, Overall Decision Maker	Fiji, Pacific Islands	Kernel
IS Professor	Unpaid Volunteer Consultant & Facilitator	Melbourne, Australia	Kernel
Commonwealth of Learning (COL)	Project Funder through Financial Support	Canada	Periphery
UNICEF Staff	Expertise & Feedback Providers, Functional & Technical Testers	Pacific Islands & New York, USA	Periphery
International Climate Experts	Expertise Providers	Globally Distributed	Periphery
Three Research Students	Developers in the Core Development Team	Hongkong, Melbourne & regional Australia	Kernel
Three Chinese Youth	Functional Testers	China	Periphery
Four Fiji Adolescents	Social Media Facilitators, Future Users	Fiji, Pacific Islands	Periphery
Pacific Islander Youth	Requirements & Feedback Contributors, Future Users	Pacific Islands	Masses

In terms of forms of participation in the PC3G project we found both direct and indirect participation [31]. The social media facilitators participated directly in the project by communicating the initial requirements and ideas, which had been provided through the FB album by other PI youth to the sponsor, who passed them on to the three developers. The PI youth thus both participated directly and indirectly as self-selected representatives of their groups in the project. This form of participation continued throughout the conceptual design mediated through the social media platform and social media facilitators. The PI youth provided further requirements, ideas, and design principles, and during the development of the consolidated game the PI youth evaluated the game and provided further feedback. In this phase the social media facilitators took also part in the project's acceptance testing and at times communicated their feedback directly to the developers.

Analyzing the different user roles [10] we see that none of the two user groups, the social media facilitators and the other PI youth, held a participative role as neither had any design making mandate or power. In a strict sense all design and development decisions were made by the developers, who though quite young were not the intended users, and ultimately by the sponsor. Still, both user groups held informative and consultative roles as they both provided information about their intended activities - playing a digital game with a serious content and purpose - and were asked and commented on pre-set design solutions, which subsequently changed based on their input. Naturally, the informative role was most prominent in the establishment and the early conceptual design phase but changed to a consultative role in the later stage of conceptual design and the development phase.

Table 3. User participation in the PC3G project

User Focus	Individual User
Forms of Participation	Direct Participation Indirect Participation
Roles of participating Stakeholder	Informative Role Consultative Role
Purpose of Participation	Functional Empowerment Democratic Empowerment

Lastly, with regard to empowerment [7] we can determine that functional empowerment was achieved as UNICEF (P) reported an enormous growth of interaction and engagement with and by PI youth during and after the PC3G development. The youth themselves posted their positive perception of the development process and game on social media, both indicating that the

juvenile users enjoyed the game and carried out the related activities to their own satisfaction and in an effective and efficient manner. Democratic empowerment in its original meaning of a mandate to participate in the decision making concerning the design and development the PC3G did not occur for the participating potential future users, however the DPD activities in the PC3G project and its outcome contributed to the democratic empowerment of the PI youth in the sense that it enabled them to exercise their right to receive and impart information, in this case on the important issue of climate change by playing a digital game on a social media platform, and as a consequence being informed and potentially able to influence decision making affecting their own lives. Table 3 summarizes the identified user participation in the PC3G project.

It is interesting to note that with regard to user focus in DPD, the utilization of social media such as FB has contributed to making it much easier to relate to individual users, so that an average user or user group can be derived based on the individual contributions, and there is no further need to create fictive users. Additionally, the concepts of direct and indirect participation became more blurred in our case, as all participants participated directly in one sense as they contributed through social media, and indirectly in another sense, as their views were filtered by the social media facilitators.

On this background, our work on user participation in DPD also adds to the studies of design processes in ISD. Wastell, Sauer and Schmeink [42] argue that a part of design research in IS concerns the effectiveness and suitability of design and development approaches. They furthermore contend that design research generates knowledge of direct practical relevance. Our work shows how actual user participation in ISD can be organized in a project to result in a process and outcome that all stakeholder groups appreciate. In practice, the categories in the framework thus can be used for preparing and performing user participation in DPD and for after-the-fact reflection and collection of lessons learnt.

However, our case indicates that the concepts of user and user participation in PD and DPD with their humanistic orientation and objective are somewhat limited when comes to identifying all beneficiaries of a project environment such as the PC3G. While an outcome to the satisfaction and benefit of the potential future users, the target PI youth, was achieved, there were also other beneficiaries such as UNICEF (P). The concept of value cocreation, which UNICEF (P) itself used in the press release cited above, captures this shortcoming. It is rooted in the service literature [1], which however is grounded in a different, more instrumental outcome-oriented perspective. In this context, the concept of PD has been related to that of cocreation where PD and DPD understood as practices of collective creation have been labelled cocreation [21]. Cocreation has also been regarded as an extension of PD and DPD [32]. Further work on how PD and DPD and value cocreation are related is needed.

7. Conclusion

We have investigated the question how users participate in DPD in practice. For this purpose, we studied an ISD project, which was initiated by an intergovernmental organization and executed to a large part by mainly youth to develop a digital game to raise attention about the important issue of climate change. Our work commits to the sociotechnical perspective within IS research by connecting, in our case even accentuating, humanistic, and instrumental outcomes as recommended by Sarker et al. [36]. We found genuine user participation carried out by adolescents who were social media facilitators, and by other youth who contributed requirements, design ideas, and feedback to the development of the game. Our analysis shows that the integrative framework for user participation, which consists of well-established concepts can be fruitfully used in a new context to understand aspects of DPD and how it can be performed as an instance of ISD. As such we follow Markus and Mao's [29] call, revisit participation concepts and show that they are also useful in a novel environment. We also contribute with a practice study of a design process as requested by Bratteteig [5] to broaden the perspective on design research.

We recognize that our study is exploratory and that the PC3G project belongs to a special class of development project, which may limit the generality of our findings. We also acknowledge that knowledge gained through case studies may not be formally generalizable but, following Walsham [40] we contend that this does not mean that it does not contribute to

the collective body of knowledge, both academic and practical, of a discipline as our research adds at the least rich insight about user participation in DPD as a possible and vital element of ISD. Yet, further research, which applies and refines the framework, is necessary to allow for more theorizing about user participation in DPD as an approach to ISD.

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