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<https://aisel.aisnet.org/scis2023/10>

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FROM REPRESENTATIVE TO TRANSFORMATIVE USER PARTICIPATION – A CASE STUDY OF PUBLIC HEALTHCARE DIGITALIZATION

Research paper

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Abstract

User participation in IS implementation is a core topic for the IS community. While most of our current participation theories emerged in the 1990s and 2000s, recent developments such as the emergence of large "half-built" products and the increased emphasis on digital transformation necessitate revisiting current understanding of participation. User participation is not anymore about merely representing the organization's domain knowledge - what we call representative participation. Users participating in modern IS implementation projects need to possess additional types of knowledge and skills. This includes knowledge about the products, knowledge about the intended transformation, and leadership skills, to name a few. We investigate this emerging type of user participation - what we call transformative participation through a case study of an IS implementation project within healthcare. We discuss the knowledge and skills needed to function as transformative users as well as the challenges faced by these users.

Keywords: User Participation, Digital Transformation, Transformative User, IS Implementation, Healthcare, Public Service, Electronic Health Records, Half-built Systems

1 Introduction

“building the solution was kind of a combination of how we do it now, how would we like to do it, and how can we make things easier with the new system.”

The above quotation is from one of our interviewees, who talks about her participation in the IS implementation project – Helseplattformen, that we study in this paper. Digital transformation promises to radically improve the organizational efficiency and competitive advantage in an increasingly global and competitive business landscape (Vial, 2019). The increased focus on digital transformation has moved the scope of IS from standard, one-size-fits-all systems to an ‘era of configurability’, offering flexible and generic half-built systems that can be configured to support individual needs. They are present in the form of enterprise resource planning (ERP) systems, off-the-shelf or packaged software, and platform-based systems (Pollock, Williams and D’Adderio, 2007; Jesper Simonsen, 2008; Lyytinen and Newman, 2015). These systems have been widely adopted across the public and private sectors and they are often called modern, large-scale or ultra-large information systems (Lyytinen and Newman, 2015; Roland *et al.*, 2017). A key goal for adopting these half-built systems is to combine their already-tested benefits with the promise of digital transformation here and now (Pries-Heje and Dittrich, 2009; Wessel *et al.*, 2021). However, there has been debate about the lower success rates of such systems or challenges and complexities associated with them. This includes longer than expected implementation time, getting out of budget, falling short of user expectations, and sometimes even resulting in a

complete failure (Jesper Simonsen, 2008; Shepherd, Clegg and Stride, 2009; Berente and Yoo, 2012; Baiyere *et al.*, 2017).

The role of user participation is considered important in overcoming the said challenges. User participation has been a core topic in IS research since 1960s and it is expected to positively impact system success with benefits like greater user satisfaction and acceptance, increased system quality, better communication, and conflict resolution, and decreased implementation time (Lin and Shao, 2000; Markus and Mao, 2004; He and King, 2008; Bachore and Zhou, 2009). However, the way user participation is practiced in digital transformation projects that involve half-built systems is different from how it was done during the 1990s and 2000s. These projects have increased focus on customization/configuration instead of building systems from scratch (Ellingsen and Hertzum, 2019). Customizing/configuring the system and aligning it with the organization's digital transformation agenda not only requires the participating users to represent the demands of the present (their current work practices) but also the desired future (how the work should be done in future to support digital transformation). In addition, they also need to know the half-built capabilities of the system they are customizing and how to exploit those capabilities to achieve the organization's DT goals. This type of user is given various names in the literature, such as expert users, key users, champions, innovators, etc. (Wu and Wang, 2007; Pan and Mao, 2013; Renken and Heeks, 2019). In our view, what binds these definitions together is the need for digital transformation through user participation. We, therefore, label this type of participation as *transformative participation* and the participating users as *transformative users*. This paper aims to explore how does the transformative participation takes place in modern IS projects by focusing on the knowledge and skills needed by the participating users to act as transformative users. We build on the emerging IS literature about participation in digital transformation, and through a case study contribute to a better understanding of this new form of user participation.

The implementation project (called project in this paper) for Helseplattformen is our empirical case in this paper. The project is about the implementation of a half-built EHR (Electronic Health Record) system in central Norway by one of the largest EHR vendors globally, Epic Foundations. User participation was emphasized in the case and different groups of users are involved in various project stages, where one of the key user roles is subject matter experts (SMEs) who represent their fields of specialty. SMEs have a strong involvement in the project's entire lifecycle and their tasks includes providing feedback and direction about their area of specialty to design the workflows and content, approving these workflows and content, testing the system, and assisting in the training of end-users. SMEs are regarded as a key to ensuring system success since the workflows and content of the system are decided by them. Based on interviews and observations with these SMEs, we want to explore how they play their role as transformative users. This includes exploring the knowledge and skills they possess, the necessary knowledge and skills they lack, and the challenges they face to act as the enablers of digital transformation perspective through user participation. Following is our research question:

- How does transformative participation take place in modern IS implementation projects?

The paper is organized as follows. In the next section, we present relevant literature on user participation, types of users, and different methods for user participation to give a deeper understanding of the topic. Section 3 describes the empirical case and section 4 presents our research methodology. Section 5 presents the findings from our empirical study followed by the discussion section. Towards the end, we present the limitations of our study and future research directions.

2 Theoretical Background

2.1 User Participation

The role of user participation in the development and implementation of information systems is widely discussed and well-recognized in IS literature (Markus and Mao, 2004; Bachore and Zhou, 2009; Schermann and Merz, 2018). A general goal for involving users is to capture their needs and

requirements and use their expertise in the development and implementation of the system. Despite extensive research, it is argued that user participation is not a definite, harmonized concept. In reality, it may take many forms and can occur at many levels as well as it is used interchangeably with terms like user involvement and engagement (Bachore and Zhou, 2009). Barki and Hartwick refer to user participation as the design-related behaviors and activities that the users perform during the system development and user involvement as the subjective psychological state of the users (Barki and Hartwick, 1991). In addition, Kappelman and McLean combine user participation and involvement to refer to the concept of user engagement (Kappelman and McLean, 1991). It is argued that the participating users must be able to influence development choices, otherwise, practicing user participation won't be useful (Markus and Mao, 2004). Similarly, Simonsen and Robertson emphasize that the users should be legitimate and acknowledged participants instead of only being the informants to label the participation as genuine participation (Simonsen and Robertson, 2012).

The importance of user participation in IS projects is mostly evaluated in terms of its contribution to the system's success. The benefits of user participation that are popular in measuring success are user satisfaction and acceptance, better communication and conflict resolution, increased system quality, and decreased implementation time (McKeen and Guimaraes, 1997; Jiang, Klein and Chen, 2006; Melchor and Julián, 2008). Several review articles examine the relationship between user participation and IS success, and present varied beliefs highlighting both positive and negative aspects. The findings from He and King show that user participation is minimal to moderately beneficial to IS development and they argue that the user participation alone may not be sufficient to predict the success and should be treated as one of the number of means for IS projects to be successful (He and King, 2008). Bano and Zowghi also advocate the positive aspects of user participation toward system success, but they label it as a double-edged sword that could cause more problems than benefits if not appropriately managed, e.g., decrease user satisfaction and acceptance (Bano and Zowghi, 2015).

2.2 Understanding the User Types and Characteristics

Iivari et al. refer to the user as the great unknown of system development and emphasize that it is vital to understand the users when developing new IT applications and services (Iivari, Isomäki and Pekkola, 2010). It is also argued that the users are at the heart of digital transformation since their work practices and routines get affected as a result of the intended transformation (Brocke and Thurner, 2009; Henriette, Feki and Boughzala, 2015). Markus and Mao define stakeholders as a general group who is likely to be affected by the system and logically qualify to be a part of system development or implementation and users as a subset of stakeholders who get the chance to be a part of system development and implementation activities (Markus and Mao, 2004). Wu and Wang further classify the user as key users and end users. Key users are considered to be the direct users of the IS, carrying more domain knowledge and expertise for preparing the requirements for the system and, end users are the ultimate users of the system possessing specific knowledge of the part of the system they need (Wu and Wang, 2007). The term key user is also used interchangeably with super users and power users, and they are considered essential to system success because of the many hats they wear; boundary spanners for knowledge management and exchange, change agents, trainers, and help-desk resources (Pan and Mao, 2013; Maas, van Fenema and Soeters, 2016; Obwegeser *et al.*, 2019). More specifically, the users facilitating the knowledge part, providing the system requirements, and customizing/implementing the system are called outward-facing users, whereas the users facilitating and training the end users utilizing the system-related knowledge are called inward-facing users (Pan and Mao, 2013; Obwegeser *et al.*, 2019). There has been interest in the literature around the process of identification and selection of key users as well as the skills and competencies they need to be effective in their role (Mahdavian and Mostajeran, 2013; Obwegeser *et al.*, 2019). However, the main focus of these studies is on the domain knowledge and subject-related competencies of these users. Iivari et al. also highlight the fact that despite extensive research around user participation, the users are still often seen as a validator of design decisions, having local knowledge about the context of use (Iivari, Isomäki and Pekkola, 2010). In addition, some studies have also attempted to enhance the key user concept considering the advancements in modern-day IS

projects. One such example is the study by Weigel et al. around the concept of influencer users participating in digital transformation projects (Weigel, Zeuge and Sauter, 2021). However, these influencer users have quite a different role than the key users since they work like social media influencers, mainly promoting the transformation process and do not have much focus on knowledge sharing and system implementation activities. Another approach is the lead user methodology for user participation by Hippel et al. where the most progressive users are identified and involved in the idea generation and development phases (Hippel, 2016). However, this approach is used in product development processes and it's not very applicable to the organizational IS case that we are looking into.

To sum up, recent literature on user participation has started to look at participation beyond mere representation. The types of users discussed above play various roles in bringing their participation beyond merely validating designs created by others. We, therefore, conceptualize the two types of participation as: 1) representative participation - where domain knowledge and understanding is central, and where the user represents a typical user of current systems. 2) transformative participation - where knowledge of future work practices is central in relation to the digital transformation perspective, and participants are required to use current means (knowledge of current practices, off-the-shelf product, visions of their organizations) to transform their current organizations.

3 Empirical Case

Our case, Helseplattformen, is about the implementation of a joint medical record solution in central Norway. Although Norway is one of the early adopters of ICTs in many areas, including healthcare, the systems used by health personnel are believed to be not very modern and up to date. The Norwegian healthcare system is complex in the sense of how Norway is divided into counties and municipalities, with each municipality having the right to do and use what they think is best for them when it comes to primary healthcare. Secondary healthcare, i.e., hospitals, on the other hand, are owned by regional health authorities and can make their choices and decisions. This has resulted in the use of different systems in different counties and municipalities, which causes a mismatch when it comes to communication and sharing of information between all these organizations and systems. Therefore, the government decided to transform the healthcare systems by working towards a joint technological solution for the entire health and care sector by setting a national objective called "one citizen – one health record" (omsorgsdepartementet, 2012; Bygstad, Iden and Øvrelid, 2022). As a result, the central Norwegian region procured Helseplattformen, a pre-existing half-built packaged solution by Epic, an American vendor. The implementation of the system will affect around 40,000 employees in municipalities, hospitals, the private sector, and 720,000 inhabitants, and the project costs approximately 2.7 billion NOK (EUR 270 million). The system is to be implemented in several user organizations, including a major hospital in the region, a large municipality - Trondheim, and several smaller municipalities. A dedicated company called Helseplattformen AS (owned by both hospital and the municipality) was established in March 2019 for contract follow-up with the selected supplier and to work as an intermediary between the vendor and user organizations. In addition, the user organization, e.g., the hospital and the municipality set up their local implementation projects which were responsible for organizing the local implementation tasks. The data collection for this paper was carried out in the municipality side of the project. Figure 1 shows an overview of the organizations and users involved in the project.

User participation is an area of key importance in the project, and different user groups are involved in the project in different capacities. Broad user participation is also needed because Norway has a municipal healthcare system that is relatively different from the American healthcare system (on which the vendor's system is based). The involvement of relevant user groups was necessary to ensure that the local needs and requirements are accounted for while configuring/customizing the system. One of the key user groups involved in almost all phases of the project and regarded as a key to system success are the subject matter experts (SMEs). SMEs have a strong involvement in the project's entire lifecycle and their tasks include providing feedback and direction about their area of specialty to design the workflows

and content, approving these workflows and content, testing the system, and assisting in the training of end-users. The local implementation projects had recruited their own SMEs for participation in the project. The municipal side of healthcare is divided into 12 specialization areas and all the SMEs are grouped into these 12 areas. Each area is represented by one lead SME responsible for managing all other (normal) SMEs in that area. The subject matter experts, on behalf of their subject group or area of specialty, collaborate with the project and vendor in setting up and adapting the solution, and around 400 of them are involved in the project in 20, 40, or 60% positions. Local implementation projects also recruited super users to have an active role in training end-users. Other than SMEs and super users, Helseplattformen AS had recruited application analysts who were in charge of the technical customization process and were working as developers of the solution.

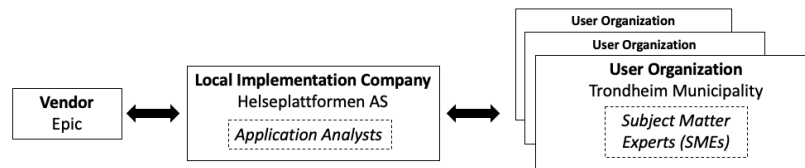


Figure 1. Overview of the case

4 Research Methodology

To address our research questions, we conducted the investigation in the form of a single case study of an IS implementation project, Helseplattformen. We use case study because it allows us to understand the emerging phenomenon in its natural setting (Yin, 2017). The findings in this paper are based on participant interviews, field observations, and review of project documents and publicly available data about the case. The first author conducted five semi-structured interviews with the subject matter experts (SMEs) from the different areas of specialty from Trondheim municipality, and we extensively draw on the interview data in this paper. Two interviewees worked as leading SMEs whereas the other 3 were normal SMEs. Interviews were conducted by the first author in May-June 2022 digitally through Microsoft Teams or Zoom in the English language. Each interview lasted between 50 to 70 minutes, and the interviews were audio/video recorded after obtaining consent from the interviewees. The interviewees were recruited using two methods. First, we contacted our reference person in the municipality who holds the coordinator position there and we were asked to share an overview of our interview guide/themes that we wanted to cover in the interviews. We were provided the contact details of three SMEs (one leading and two normal) who we interviewed later. Secondly, we found the details of SMEs publicly available on the municipality website and sent emails to some of them asking if they were interested in being interviewed. We got some replies where 2 more SMEs (one leading and one normal) agreed to be interviewed, while others stated that they were too busy with the project and did not have time for interviews. We asked our interviewees questions about their motivations and process of involvement in the project, the project activities they were involved in and their role in those project activities, their interaction and communication with other key stakeholders in the projects like the vendor, project leadership, other user groups etc. as well as the challenges they faced in the participation journey.

The second data source is the field observations consisting of direction setting meetings (described later in the findings part) recorded by researchers in our team. In these video recorded meetings, SMEs were present along with the vendor representatives configuring the workflows and content of the system. We observed 05 such direction-setting meeting videos (each varying between 60 to 90 minutes) to build an understanding of how the participation was taking place in those meetings. Besides interviewees and observations, we also relied on publicly and internally accessible documents about the case generated by the case organization and the vendor. Observation sessions and documents helped us getting a good overview of the case, understanding the roles of different users in project particularly SMEs and knowing the activities and tasks the SMEs were involved in. This information was very helpful in

preparing the interview guide and minimizing the bias of entirely relying on what the SMEs told during interviews. Table 1 provides an overview of the data, including interviews and documents. All the interviews were audio transcribed, and we used QSR NVivo for thematically coding the transcribed interviews. In the first place, the first author coded the data into some general themes, and the coded data and themes were shared with the second author for review. The second author looked into the data and extracted further themes, which were later presented to the team we are a part of. The collaborative coding exercise helped us further refine the themes on which we built our findings.

Data type	Description
Interviews	5 interviews in total. 2 with the lead SMEs (Lead SME-1, Lead SME-2) and 3 with normal SMEs (SME-1, SME-2, SME-3)
Field observations	Video recordings of five (05) direction setting meetings
Document analysis	Project plans, presentations, reports

Table 1. Overview of data sources

5 Findings

5.1 SMEs Involvement and Participation Practices

As described in the case description, there were two types of SMEs, leading and normal, with leading SMEs having a more central role. They were not selected democratically or statistically, which is mainly the case for purely representative users. They were chosen because they were the most experienced, knowledgeable, and skillful people in their units. Helseplattformen AS was directly involved in selecting these users from different units with the help of the unit leaders. Since the leading SMEs had a more central role than the normal SMEs, there was a greater focus on knowledge and skills while selecting them. They figured out who are the most experienced people in those units and then directly reached out to them, offering positions as leading SMEs in the project or asked their unit leaders that the project needed these specific people. Normal SMEs were also selected by the unit leaders, where they picked up their best resources.

“I got a call from one of the leaders in the project, and he said that he wanted me to come in as a lead SME. And I said, no [...], I have other things to do, I was very hesitant. And my leader also said that he didn't want me to go, he wanted me to stay in the unit. But that leader in the project kind of pushed him, he said that it's really, really important that we have this kind of competence, we really want her. So finally my leader agreed and he said [...] and I could come on board if I wanted to” (Lead SME-1)

“I think they were asked kind of from the leaders. The leaders picked someone they thought would be able to do the job in a good way. I think for them it was important that they had someone who were positive to implementing health platform and kind of had good skills and were able to kind of good figure for helping the implementation.” (SME-1)

We asked the interviewees about their motivations for getting involved in the project and found various answers.

- Their unit leaders and colleagues thought that they are the best ones to represent the unit in the project
- No personal motivations but since their leaders asked them they couldn't say no.
- Interest in the project. Involvement in making a digital solution could be an opportunity for future
- Previous systems were old and outdated and need for a new system for their unit and colleagues

“I thought this is an opportunity. I was also very interested in participating and making a good digital solution for us. I had a thought that I have something to give to and add to this project but I didn’t know very much at the start” (SME-2)

“the platform that we used didn’t work well, it was an old fashion platform from the early 90s and I was really motivated to get another platform and I believe that we need to pick a person who had the quality to attend the project. We spoke about this in my group, and everybody agreed that I could join this project” (SME-3)

Regarding participation activities and practices, these were either self-organized or organized by the local implementation project, Helseplattformen AS, or the vendor. Leading SMEs were responsible for calling in the self-organized activities, which were the weekly group meetings (consisting of the lead SME and all the normal SMEs in the group) to discuss the progress and challenges. One of the project coordinators from the municipality was generally part of these meetings where the progress and challenges were discussed. Besides regular group meetings, leading SMEs reported being a part of intragroup meetings that only the 12 lead SMEs from the 12 areas of specialty were attending. These meetings were the arenas to discuss the activities and challenges happening in different groups and to see if they were working in line with the mandate they had been given. These meetings were also held on a weekly basis.

“we have a lot of different meetings and structures, [...] one meeting that we had during the entire project, which I think is very important and that’s the meeting for all the lead SMEs in municipality. We meet every Friday for half a day discussing matters that regard the municipality, I think this has been a really important meeting for us to be able to make a system that works for the municipality more as a whole and not only the specific areas.” (SME-1)

Each subject area also had the support of expert users from their specialty, called the expert group. They were available on demand, and SMEs had meetings with these expert groups whenever they needed to discuss some ideas or get feedback on the solutions they were developing. Other than these regular self-organized progress and update meetings, direction-setting meetings were one of the important activities organized by the project and the vendor. These meetings are regarded as a key activity for system configuration since this was where the key decisions were made that influenced the development of core workflows and functionality in the system. A total of 271 direction-setting sessions (for both the hospital and municipality) took place to set up the solution. Each direction-setting session was led by one or more representatives from the vendor organization, and different SMEs and the lead SME participated in it. SMEs were shown the existing application workflows based on the vendor’s previous implementations and best practices. The SMEs task was to ask questions, provide feedback about the highlighted workflows and decide what changes should be made in the system. The functionalities that SMEs fully disagreed with or those that didn’t exist in the foundation system were taken beyond these direction-setting meetings, where the SMEs made the workflows from scratch which were later integrated into the system. SMEs were also involved in adoption meetings where their task was to approve the final workflows and functionalities in the system. SMEs also had a small role in the testing and training phases, but it was not much because end users were actively involved in the testing phase and super users were active in the training phase.

5.2 SMEs Domain and Solution Knowledge

The users' knowledge, competence, and skills were some of the main themes we observed in our data. In the user involvement and motivation section, this appeared quite frequently that there was a lot of emphasis on knowledge and skills while selecting the SMEs. The first thing is domain knowledge and a good understanding of work practices. Our data shows that all the SMEs were very good at understanding their current work practices. Some also discussed knowing how things should be done in the future to achieve the benefits associated with the agenda of introducing Helseplattformen (strategic knowledge).

“we started the project where we [...] got information about how are we doing it now, how would we like to do it if we had another system, what things are we using a lot of time on right now that [...] could get better with the new system. (SME-1)

“I have a lot of competence in the legislation and the law for patient rights, so it was kind of natural that he wanted me to participate because I’ve been working a lot with that across the behavioural health area in the municipality” (Lead SME-1)

Since the SMEs were working with the vendor to adapt a generic system into their organizational context, an important knowledge that they needed was translational knowledge which refers to knowing how to translate the vendor system to their own settings (space of possibilities). Translational knowledge requires a very good understanding of the vendor’s system since the domain and strategic knowledge cannot be very helpful until you know the system’s capabilities. SMEs reported not knowing much about the vendor’s system when they said yes to participation in the project. What SMEs knew was that they would be participating in making a digital solution for the region. They mentioned having no idea of what activities they were going to take part in and the complexity of those activities.

“I had a thought that I have something to give to and add to this to this project but I didn’t know very much at the start. We just knew that this helseplattformen was something that we were supposed to get started and work with.” (SME-2)

“looking back I don’t think I really understood the size and the complexity and maybe [...] responsibility either of being in a big role in the project.” (Lead SME-2)

On the other side, the vendor’s foundation system is based around the American hospital model, whereas the Norwegian healthcare setup is mainly municipal, so the level of understanding of the municipal healthcare system was also low on the vendor’s end. This mutual lack of understanding resulted in SMEs working and struggling more to acquire the required knowledge. Since most of the municipal healthcare functionalities were missing in the vendor’s foundation system, SMEs also had to do a lot of work designing the new workflows from scratch, which were later integrated into the system. The new workflows were a combination of how things were done previously as well as new ways of doing things which highlights their ability to conceptualize future work practices. However, finding the best way was not always easy because of the lack of understanding of the vendor’s system. SMEs also reported sometimes saying yes to things they didn’t completely understand, and they knew nothing about the implications of saying yes to an unknown thing.

“Epic had a base of flowsheet rows that were built for others and we were asked to pick those we wanted to use and then they would be translated, and we could plug them into our system. But [...], that didn’t make sense to me at all and [...] we decided that we needed to make our own flowsheets because it didn’t really apply to us at all. I think that is the case for most of the areas actually.” (SME-1)

“I think my knowledge and my understanding was quite low at that point where we had the direction sessions so looking back, I think we made some decisions, or we said yes to things that we didn’t quite understand, or we didn’t have enough knowledge to actually say yes or no” (Lead SME-2)

Since our case is about a digital transformation project, the knowledge of IT systems and technological competence are generally considered important for working with such projects. However, none of our respondents or the reviewed documents reported any emphasis on the need for technological competence for being an SME in the project.

5.3 SMEs Skills and Competences

The SMEs, besides possessing good knowledge and experience, were also required to have some important skills since the combination of knowledge and skill makes them effective in their role. One such important attribute is that they are active people, well-known across their units, and carry a positive relationship with the members of their units. This is important because of multiple reasons. First, because these users have to represent their units in the solution development so it is important that the people could trust them and believe that they have the capability of designing the best solution for them. Second,

this skill makes it easier for SMEs to return to their units and get feedback whenever needed. Last but not least, this is also relevant to the point that the SMEs are believed to be the ambassadors of the new solution in their units, and they can help in minimizing the user resistance.

“the feedback that we get is that everyone is super happy [...]. They trust us and they have confidence in us making good solution. [...] we all had really good relations within our own departments or units when we started and I think they felt more reassured that we have included them in processes, we have gone back to them when we have struggled [...], we’ve gone back to the end users [...] and said hey, this or this, which alternative should we go for? So[...] I think that makes them feel that we have included and respect them as well.” (Lead SME-1)

“Besides qualifications, I needed that they had a certain amount of self-drive because I needed people to be able to do stuff themselves without me holding their hand on time.” (Lead SME-1)

Another important set of needed skills is interpersonal and communication skills. Having these skills is super important for SMEs since they have to communicate with different stakeholders in the project, where the most important is the communication with the vendor to conduct the project activities. SMEs have to negotiate their needs with the vendor to align the system with the organizational transformation agenda. An important communication skill related to our case was fluency in English. As mentioned earlier, the system was being implemented by an American vendor, and they speak the English language. While selecting the SMEs, they had the criteria that they could speak English since only speaking the Norwegian language was going to be a big hindrance. However, SMEs reported that they still had to face the language barrier because it’s not easy to explain the technical/medical terms in a language you do not frequently use in your daily practices.

“I think the criteria was that you have knowledge about municipality and the workflows. Also, [...] they wanted people that could talk English because in the beginning everything was in English. So, I think one of the criteria’s was that you could communicate sufficient in English.” (SME-1)

“there’s a lot of communication that could have been easier because you have the language barrier, culture barrier and you have like the education barrier because when health professions are talking to IT people, that’s kind of a difficult match. [...] if we had the same discussions with the Norwegian IT developers, I think it would also be difficult.” (SME-1)

In addition, SMEs also needed to be good at collaboration since they had to frequently collaborate with other users like the expert groups, their units, and other SMEs. SMEs reported that their collaboration with the expert groups and their units was very fruitful in designing a solution that will work for everyone and not specifically for some particular users. Besides vendor, expert groups, and their units, SMEs also had to frequently communicate and collaborate with their managers, project leaders, and project coordinators, and having good communication and interpersonal skills made their job easier.

“In the expert group, the things that I brought up were things that I felt that we needed to discuss with regional people. Also we were trying to develop a new way of assessing overdose risk and then we included the expert group, hey, who of you are working with addiction medicine and would like to help us develop this [...], then we asked also people in the hospital and people working in the municipality [...] and we brought together a group across municipalities and hospitals in order to develop a new tool that we could use to assess some overdose risk.” (Lead SME-2)

“We got their points of view and we could kind of helped broaden our own view, because we were only from Trondheim municipality and we needed kind of input from other people to make sure that we weren’t just the thinking narrowly about how things are done internally. We have to make sure that we made a solution that would work in that region and not only Trondheim” (Lead SME-1)

Another important attribute besides knowledge and skills we found necessary for SMEs was the autonomy and decision-making liberty assigned to them. SMEs reported that they worked independently and were mandated to make important decisions. Project documents also show that SMEs had the authority to make decisions according to their assessments, but they could also choose to include expert groups if necessary.

“we were kind of given the authority to make decisions. Our main job kind of was to build the system that would work. Out of the workflows we use today in the service and if we wanted to change something we of course asked the leaders like in the new system we can do this instead of the other way, what do you think? what should we choose? but otherwise, we kind of worked independently and built the system together with the other lead SMEs.” (SME-3)

5.4 Challenges and Opportunities in Participation Process

A major challenge the SMEs faced during the participation process was the volume of work needed. They were involved in so many activities with a lot to do and learn all the time, and they reported this to be quite hectic and challenging. As a result, some SMEs tried to quit or showed resistance against working on the project. Replacing a quitting SME with another one wasn't easy either since such knowledgeable and experienced people are short in supply in the units.

“I tried quitting a few times in the first year but was convinced to continue. I gave a lot of a lot of resistance. I think I didn't realize how large this project was and there was a lot of frustration [...], it was difficult to get people to cooperate and it took a lot of time, a lot more of my than my 60%. I was used to managing my own schedule, and suddenly someone else managed my schedule. Just calling in meetings all the time and it didn't fit with kids, doctor's appointments, things happening in school for the kids, my own career plans.” (Lead SME-1)

“I was everywhere because the behavioral health area is so large. I would have a series of meetings and my schedule would be like it was completely blocked from morning till evening without any break, it was back-to-back meetings all day. A lot of information to take in, a lot of people to meet all the time.” (Lead SME-1)

SMEs were recruited in 20,40, or 60 percent positions in the project, meaning they had to work with their regular job the rest of the time. Because of the unpredictability and lack of knowledge about what is expected from them, they said yes to these percentage positions, but eventually, they ended up using much more time than they had promised. SMEs reported their regular jobs got affected because of this. An SME suggested that one should either have a higher job percentage or nothing at all since dedicatedly working for the project and not worrying about your routine job makes work more efficient. However, another perspective that came up was that the SMEs should be well connected with their units since they are also ambassadors of the new system in their units, and they should actively engage with people in their units.

“I think I got to the point where I felt I didn't handle the job or the tasks or the workload was too much. I just couldn't cope with it. I think it also played a part because my position was only 60% at that time so I still had my head in my normal job like two days a week and changing back to Helseplattformen the other three days. Looking back, I think it was extra demanding, not being able to focus only on the project.” (Lead SME-2)

There was discussion about the lack of training for SMEs around what they are expected to do to make the solution ready to use and their cooperation with the vendor. Lack of understanding about this aspect was apparent from the instances reported above, where the SMEs sometimes said yes to the things they did not completely understand. However, given that the SMEs were already overloaded, carrying out this training is not easy.

The challenging role of being an SME also carries some opportunities. One such opportunity is the user's development as future leaders. Since SMEs have gone through an extensive learning process in terms of domain knowledge, strategic knowledge, and technological knowledge to design efficient digital solutions, it prepares them for holding leading positions in the future. One of the lead SMEs we interviewed mentioned that she was offered a municipal director position after working for a couple of years on the project.

6 Discussion

Although the extant literature around user participation in IS is mature, we believe that the challenges in modern-day IS projects require revitalizing the theories of user participation. Most of these theories were developed during the 90s and 2000s, focusing on what we call representative participation. In representative participation, users represent their expertise related to their current role in the organization. Recent literature on participation shows a shift from representative participation to what we call transformative participation. In transformative participation, users participate not only to present their current role and expertise but also to help their organization transform into a new digital future. This kind of users are given various names in the literature, such as lead user, champions, innovators, etc. (Wu and Wang, 2007; Pan and Mao, 2013; Renken and Heeks, 2019). However, connecting these users' role to digital transformation is important because their participation should enable user-initiated deep transformations as opposed to merely resolving usability issues. Our case is a typical example of organizations going through such digital transformations aided by half-built products. We investigated the IS implementation project, Helseplattformen, as a single case study to demonstrate how transformative user participation takes place and how transformative users cope with the involved processes. We interviewed and observed the participating subject matter experts (SMEs) to explore the necessary knowledge and skills they possessed and lacked to function as enablers of digital transformation. In representative participation, users are often led (by the designer) through a process of "knowledge acquisition" where they describe their version of their work practices (Bratteteig and Wagner, 2016). Such processes can be shaped as user workshops, interviews or observations. However, transformative participation requires more from the users than just representing their current practices. They also need to learn and create new knowledge and new digital practices for the future. Therefore, transformative participation can be more challenging. This demanding role can cause user resistance to serve as a transformative user. Transformative users are usually in short supply compared to representative users, who can potentially include anybody from the organization. We argue that building transformative participation knowledge in the whole organization should be a part of the management's strategy.

Knowledge and skills needed for transformative participation appeared as a key theme in our findings. As argued earlier, the existing literature mainly emphasizes the domain knowledge and expertise of participating users. However, we argue that the current domain knowledge is not sufficient to be a transformative user. In fact, only possessing this knowledge could appear as a hindrance to digital transformation. Traditional user participation labels users as near-sighted people (Sørensen, 1998), whereas transformative users are not near-sighted since they have the strategic knowledge and the ability to conceptualize future work practices. Another attribute of transformative users is that they have the willingness to let go of old ways of doing the job, and they can think about old problems in new ways. Therefore, they need an in-depth understanding of whole services and interconnections among different professional groups. They should also ideally be able to see the implications of the bigger changes and, through this knowledge, design and implement best practices based on completely new technologies. Besides knowing the current and future work practices, transformative users also need technological competence. However, the participants in our case lacked this competence, and this led to several challenges for them - particularly in communicating with the vendor. Transformative users need to possess a high-level language for digital transformation, independent of the specific products they use in each project. This language needs to be developed and could take the form of a set of high-level affordances. Transformative users will also benefit from in-depth design knowledge, e.g., developing and evaluating design concepts.

Regardless of the level of knowledge about digital transformation, it is inevitable that transformative users require training related to the specific half-built or off-the-shelf products that are being used. This requires that important decisions about configuring this technology should be made late in the project and not in the early phases when the participants are unfamiliar with its capabilities. As also advocated by several researchers in, e.g., the agile community, a more iterative approach can be useful to facilitate this type of technology-specific learning. We have observed that transformative users possess strong

leadership competencies. They are positive and act as role models for digital transformation. They also have people skills and are good at drawing on the competencies that exist in their professional networks within and outside the organization. Being part of the practices, they want to transform, they also enjoy a high level of trust among their colleagues and appear authentic in their leadership. Transformative participation can therefore be an opportunity to augment top-down change management, which often meets resistance in the organization. Table 2 summarizes the main characteristics of representative and transformative users with some examples from our data.

An important observation is the way self-organized participation practices emerged in our case. This is important because vendor-led practices tend to focus more on the vendor's solution and less on the organization's needs. SMEs participated in weekly half-day self-organized meetings to coordinate among themselves and to exchange knowledge. These meetings were perceived as very useful. In addition, each SME had access to a larger network of (non-SME) domain experts within the organization. This network was used to discuss larger transformations with a broader audience. SMEs played leading roles in both these self-organized practices. We also observed that the interactions with the non-SME networks decreased as the project moved on. This is unfortunate because it can affect the acceptance of the final solution in the organization.

Representative User	Transformative User	Examples from our data
Domain knowledge is central	Transformational knowledge is central	Transformative users understand that they have to conceptualize future work practices to achieve digital transformation: <i>“building the solution was kind of a combination of how we do it now, how would we like to do it, and how can we make things easier with the new system”</i> (SME-1)
No prior knowledge of the half-built system is needed	Knowledge of half-built system's capabilities (translational knowledge) is necessary	Lack of translational knowledge can hamper the right form of digital transformation: <i>“we said yes to things that we didn't quite understand, or we didn't have enough knowledge to actually say yes or no”</i> (Lead SME-2)
Validating choices or functionalities created by others	Creating new choices and functionalities	Transformative users have the ability of creating new knowledge/choices when needed: <i>“we decided that we needed to make our own flowsheets because it didn't really apply to us at all”</i> (SME-1)
Extrinsic motivation	Intrinsic motivation	Transformative users have the intrinsic motivation for transformation since the role comes with more challenges and need for learning: <i>“Besides qualifications, I needed that they had a certain amount of self-drive because I needed people to be able to do stuff themselves”</i> (Lead SME-1)
Limited autonomy	Increased autonomy and decision-making power	Transformative users have the authority to make decisions so they can create bottom-up directions for creating choices compared to representative users who react to a more top-down direction: <i>“we were kind of given the authority to make decisions. [...], we kind of worked independently and built the system together with the other lead SMEs.”</i> (SME-3)
Representatives of a typical user group	Future leaders and resources for future transformations	Being in a transformative role brings the opportunities for users to be the future leaders since they go through an extensive learning process in terms of domain knowledge, strategic knowledge, and technological knowledge to design efficient digital solutions.

Table 2. Comparison of representative vs. transformative user role

Our study also has implications for the management of participation in such projects. In our case, it appears that the management treats participation as representative participation, takes a passive role, and lets vendors and consultants lead most participation processes. This can be convenient in the short term. In the long term, however, the organization will fail to build relevant digital transformation knowledge and will become dependent on consultants and vendors. Therefore, management should pay attention to proactively organizing and developing transformative users. They should be prepared, and their transformative users should have a clear agenda that can help them, e.g., choose among various technical solutions. This clear agenda needs to be developed by the organization and its management in cooperation with transformative users. Transformative users need support from their leaders/managers to participate efficiently and be motivated to do so. They need to have enough time, autonomy, and a clear career path. These are demanding roles, and it should pay off to be a transformative participant.

7 Limitations and Future Work

We conducted a qualitative study to understand how transformative participation works in modern IS implementation projects. However, like most studies, our study also comes with some limitations. One basic limitation is that our findings and recommendations are based on a single case study and specifically one specific group of participants in the case. For instance, the knowledge, competencies, and skills we talk about do not include the organizational/managerial perspective on this type of user participation. Addressing this limitation is part of our future work, where we want to study project leadership and the vendor to understand how they perceive transformative participation and how the transformative participation is managed in such projects.

8 Acknowledgements

We thank the implementation project at the Trondheim municipality and the SMEs for spending time with us and providing us with insight into their practices. We thank Øivind Klungseth Zahlén for providing the video recordings of the direction setting meetings in the project. We also thank the anonymous reviewers for their constructive comments that helped us improve the paper. This study is part of the project PlatVel jointly funded by the Trondheim municipality and the Norwegian University of Science and Technology (NTNU).

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