

Designing for offline and online social work: Technology-mediated collaborative practices in and between municipalities

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Technology-mediated collaborative practices in and between municipalities

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This paper explores possibilities and challenges of introducing the collaborative web-based, wiki-inspired tool Pycipedia in Swedish municipalities. Pycipedia is designed to support social workers that work with assisting parents with cognitive impairments. Pycipedia is co-designed with social workers and digitalize some of their workflows, enabling new ways of working and allow professional collaboration across municipalities. Pycipedia has now been used 'live' for two and a half years with users in six municipalities. This paper present and discuss observations and reflections coming from running such a long-term 'live' evaluation of a tool that digitalize parts of an existing practice. Our findings deal with the effects of moving social care practices online, the inherent fragility of commitment over time, and the social worker as knowledge creators and sharers. An important perspective is the long-term implementation of our tool in the social workers' everyday practice.

CCS CONCEPTS • Human-centered computing~Human computer interaction (HCI)

Additional Keywords and Phrases: Pycipedia, Wiki, Collaborate, Design, Social work, Long-term evaluation

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1 Introduction

This paper introduces and discuss the co-design, implementation, and 30-months evaluation of the collaborative platform Pycipedia. Pycipedia is a web-based, wiki-type collaborative platform for municipality social workers. The target social workers are specifically trained to support parents with cognitive impairments in taking care of their young children. Pycipedia allow peers located in different municipalities to create, browse, edit, and share training and instructional materials to support the parents in everyday parenting situations. The social workers can also discuss support-materials and social care, send instructional materials directly to a parent's smartphone or create printouts to bring along to a consultation. Through its functionality Pycipedia turns tacit knowledge explicit and shareable, aiming at supporting an evidence-based practice [16].

For parents with a cognitive impairment, it may be especially difficult to be a parent. For example, understanding how to perform mundane activities like how to bath an infant can be challenging. The social

workers we have worked with have all been trained in the home-based support and training program Parenting Young Children (PYC) [18]. PYC is specifically designed to support both parents with cognitive impairments and their children, but emphasizes the parents and their parenting role [21].

The data used in this paper stem from a three-year long process, including 6 months of concentrated co-design activities and 30 months of platform use. This paper examines the professional use of Pycipedia and how it affects the social workers. While social workers can share materials over the platform with their clients, that practice is not part of this paper. During the years of platform use and evaluation, new features have been added in close collaboration with the social workers as they have started to appropriate the platform into their work practice. We (i.e. the authors) got engaged in the project via a municipality-led R&D Centre with whom we collaborated. They recruited the social workers and financed a large part of the project. The work started as an 'open-ended' one-year long co-design project with a group of 10 social workers from two municipalities. The initial goal was to explore the role of, and possibilities with, technology in the social workers everyday work practice but later led to the development of Pycipedia. While Pycipedia originates from a co-design project related to innovation and municipality care, this paper will take on a wider perspective, analyzing and discussing aspects of participation related to the digitalization of work-tasks, especially possibilities and challenges of implementing and using an online, digital, and collaborative (research) platform such as Pycipedia over an extended time-period. We will explore relevant aspects moving from co-designing a professional and collaborative tool, to co-designing content on the platform (aligned with notions of infrastructuring and design-in-use [7]) and sustaining use over a long period of time. Our work has made us reflect about researching and implementing new, digital workflows in a municipality context, including the effects of moving social care practices online, the fragility of commitment over time, and the possible impact designing for social workers to be both knowledge creators and sharers.

2 PYC – The Parenting young children training program

Much social work involves a high degree of freedom in how the work is conducted and much work is performed outside the office, for example in the clients' private homes. This leads to very individual and local work practices with few top-down rules or routines guiding the work. A notable exception is the client journal system each municipality uses. The need to document is mandatory and regulated by law. The social worker can attend specialized courses to improve their skills in a certain area. The Swedish Parenting Young Children (PYC) non-for-profit consortium offer one such training program. Since 2010 when the PYC program was introduced in Sweden over 450 social workers have been trained in the PYC-method [18]. Still, Sweden has 290 municipalities and many of them do not have any PYC trained social worker while other municipalities may only have a few. Sparring and professional exchange with other PYC trained co-workers is therefore not necessarily frequent events and even less so among PYC workers from different municipalities.

A typical intervention begins with a visit at the family's home to understand what difficulties the parents are dealing with. Together with the parents, the social worker identifies activities in need of support. When the social worker returns to the office, support materials are prepared on a computer. A typical material includes step-by-step instructions on how to care for the child in different situations (composed by pictograms, photos, and small texts). When ready, the material is printed and brought to the family. While pre-made guides and other materials exist, much time is spent on creating and adapting materials for each family and their specific needs. Others may feel insecure about their ability to create 'good' materials and may therefore choose not to create materials. With no easy way to share material with colleagues in other parts of the country there is little knowledge sharing and learning between social workers. Instead, there is a certain amount of duplication work.

3 Related work

Our work relates to a larger discourse on the introduction of digital work-tools and digitalization in the social care domain. In this section, we use ideas of ongoing design-processes to frame our work with the content and

knowledge creation platform Pycipedia. We also look at existing research on digital, collaborative platforms for the social care domain.

3.1 Towards participatory making and ongoing design processes

Drawing on work by Vygotsky, Engeström defines that “an activity system comprises the individual practitioner, the colleagues and co-workers of the workplace community, the conceptual and practical tools, and the shared objects as a unified dynamic whole.” [8, p. 12]. Therefore, when designing and understanding technology usage we must not only consider the artifacts, activities, or actors in isolation but together in a larger, connected, context. Kaptelinin and Bannon [13] promotes an ecological turn and have introduced the term ‘technology-enhanced activity spaces’. They argue that we should “helping people themselves create better environments for their work, learning, and leisure activities.” [13, p. 280]. Social work is often innovative by nature but in a stressed work-situation social workers seek solutions that are ‘ready at hand’ [6]. If they find an app, tool or webpage that can help them with a family or other client – they will use it. However, and as we will discuss further in this paper, to effectively transform a work practice, for example through the digitalization of specific work activities that promotes sharing and collaboration, an organizational anchoring is needed.

With an organizational support, Pycipedia can go from being an individual tool to become a meta-design level tool [7] for ‘participatory making’ [19]. Similarly, Pycipedia can become a place for participatory making and a Technology-enhanced activity space, being “a spatially and temporally organized configuration of resources, including digital technologies, which enable an individual or a group to carry out one activity or several coordinated activities.” [13, p. 294].

3.2 Implementing collaborative tools for social care work

There is a long tradition within both the HCI and CSCW domains to study new ways of both working and collaborating within and across organizational boundaries using IT [10, 22]. Remote help-giving [5], learning in online community of practices [12], and collaborative platforms [9] have all been investigated from a CSCW perspective. There has been an increase of social care co-design projects, for example to research the use of IT to digitalize care workers everyday tasks [15]. Many collaborative social care tools can be considered boundary objects [20] enabling information sharing and the coordination of work [1]. For example, the tablet-based system CareCoor allow ad-hoc collaboration between social care workers and relatives to older adults referred to social care [4]. CaseLine is a tool for parental leave planning and one of its key features is to ease the collaboration between municipal caseworkers and parents [3]. In CaseLine there is also a learning aspect where the parents learn what they can and cannot do. They can also explore, in a sandbox mode, effects of changes they make in the parental leave planning. Place4Carers is an example of care innovation that uses co-design to introduce a novel organizational model of psycho-social services for family caregivers (and not professional social workers) [11].

These systems support the collaboration of different care-teams. The above systems address and solve situations at hand by supporting collaboration and communication. Without support for sharing of best practices across collaborative teams, the above-mentioned systems support local skill-development and sharing, but not a broader sharing, exchange, and development of a profession.

4 Method

Overall, the work in this paper is based on qualitative data and the overall process can be divided into three phases (initial co-design, implementation, and evaluation).

4.1 Initial co-design work

Our work started out as a one-year co-design project with 10 social workers to investigate the innovation potential in municipality social services and care-work. During our co-design work, it quickly became clear that

the social workers had many ideas and wanted to improve their current work processes. We held numerous workshops, including design and critique sessions, and we also collaboratively analyzed the intermittent results. Our work led the group to define two distinct concepts: A) a ParentApp providing ready-made materials to a parent's smartphone and B) a 'webpage' for PYC-trained social workers where knowledge and best-practices could be documented and shared. Later in the co-design process these two concepts were combined in what became Pycipedia. A UX specialist and three programmers were recruited to develop, in close collaboration with the social workers, the envisioned Pycipedia platform into a functional prototype system.

4.2 Interviews

Once the platform was developed and one year of platform use we interviewed 9 social workers from the two municipalities. We also interviewed two PYC method-instructors that also used the platform. All interviews were semi-structured, lasted for about an hour each, recorded and transcribed. The questions covered topics like their general technology knowledge level, how often they use Pycipedia, other recurring work-tools (both digital and non-digital), experienced difficulties integrating Pycipedia into their work practice and what they felt hindered a digitalization of their workflow. The interview data have been analyzed using a thematic analysis approach [2].

4.3 Observations, dialogues with staff and steering group notes

We have monitored use, and non-use, of Pycipedia by monitoring site activity, including number of materials created, who create the materials, if they share material with parents, if they use the forum, etc. About four times a year a representative from the R&D Centre, a social worker representative and the researchers met to discuss Pycipedia, its use, its development and platform growth strategy. These discussions have also been used as data.

5 The Pycipedia platform – A system and functional description

Based on a set of wireframes, we originally developed and implemented Pycipedia using a web-based full stack Javascript application to sustain a test of about six months. An example of the interface can be seen in Figure 1.

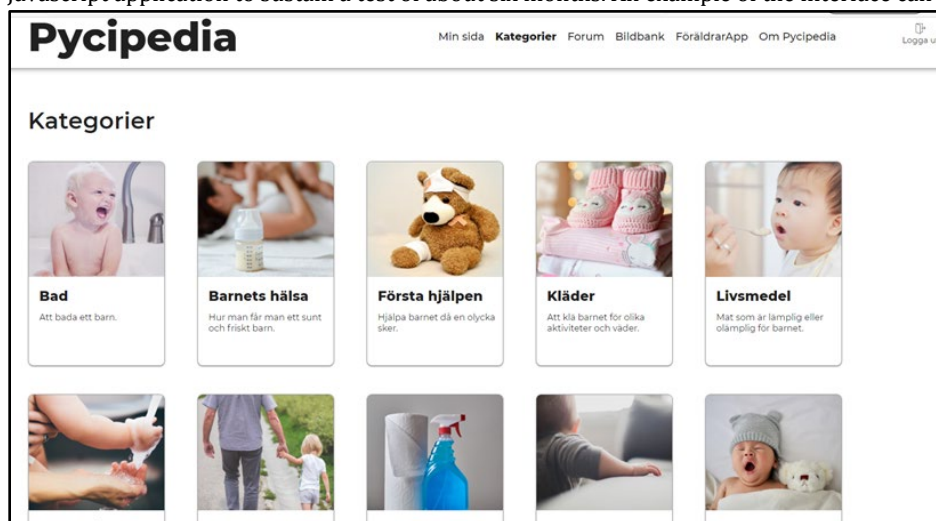


Figure 1: Pycipedia web-based interface.

The platform has four main functions: 1) a Personal landing page, 2) Categories, 3) a Forum, and 4) an Image bank. Additionally, there is a login/logout function, a dedicated page with instructions on how to install the

ParentsApp on a parent's phone, and a page with general information about the platform, support contact information etc. It is also possible to bookmark materials and forum discussions for future reference and use.

When logged in, the user reaches a personal landing page. At the landing page users can see their own materials, forum-posts, and see shortcuts to bookmarked materials. In the categories section users can browse all available materials such as pictogram-based descriptions and guides like 'how to bath your child', 'Bedtime routines', etc. The available materials have been created by the platform users. Once a material is selected, it is also possible to comment on the material, rate it, and save it as a bookmark. Additionally, all users can create new materials based on existing templates (e.g. single and double-column layouts). The material can later be edited and shared with parents via the ParentsApp. The Forum allows social workers to discuss their profession, challenges and provide suggestions to each other based on current cases and situations. The Image bank allow browsing and uploading of images and drawings (e.g. clipart pictograms). These are either created by the social workers themselves or originates from a selection of 'free to use' online clipart libraries. The images can be used when creating new materials on the platform.

Pycipedia is one of few IT tools purposefully developed to support social workers in their support of parents with cognitive impairments. It provides both an individual support in creating guides and training materials but the platform also strengthens the professional community of PYC social workers regardless of where they work. The idea of using Facebook or LinkedIn was rejected by the social workers as they did not seek a social platform but a tool that was designed to support the specific work around PYC where confidential information about families and children was protected.

6 Results

The digitalization of work processes and the new ways of working exemplified by Pycipedia come with both possibilities and challenges. Our findings deal with the effects of moving social care practices online, the inherent fragility of commitment and its development over time, and social workers as knowledge creators and sharers.

6.1 Effects of moving social care practices online

While the use of some IT tools are mandatory (e.g. the digital client journal system), other IT tools can be used by the social workers based on highly individual decisions made by the social workers themselves. Since few tools are proposed by the care organization there is a risk that the less proactive and tech-savvy care workers are left out from the positive effects of using IT-tools. Commenting on the limited access to IT, one social worker states: "Why shall we be left so far behind? I get frustrated by the low level of IT development [for us social workers]. We would really benefit a lot from using IT, but I think we get trapped in a feeling of, since we work with people, that technology will be disturbing". However, while some workers express a wish for more IT tools, the introduction of digital work practices requires some level of IT literacy and IT maturity at an organizational level.

At an individual level the digitalization of some work routines and tasks via Pycipedia challenge aspects of the social workers freedom and their established routines as it introduces a more structured way of working. Technology can be empowering, but it can also dictate when and how tasks and activities are to be performed and thereby prevent the feeling of independence that the social workers have in their current daily practice.

At an organizational level the implementation of a new IT tool normally comes with the allocation of necessary resources and training. When an organization is not involved in the decision to start using a new tool, they naturally cannot provide proper support. In our case, the municipality management was informed about the social workers involvement in the co-design process, but we have observed that the social workers took individual decisions to use Pycipedia. Without a clear commitment from management, Pycipedia may at most become part of the individual PYC-workers toolbox and not a municipality-supported tool with dedicated resources (e.g. worktime and IT-support) allocated.

6.2 The inherent fragility of commitment and its development over time

Our three-year long process has two distinct commitment phases – one for the initial first year of co-design, and one of platform use (see Figure 2). The first stage concerns the participation in the co-design process that developed the Pycipedia concept. This stage started with the R&D Centre recruiting two municipalities for the project. They also handled all the formal contacts with the different stakeholders, including the social workers' local team leaders and us researchers. The R&D Centre also contacted the social workers together with us to plan the project setup and start. Some of those social workers were also certified instructors in the PYC method. These are named 'Lead users' in Figure 2.

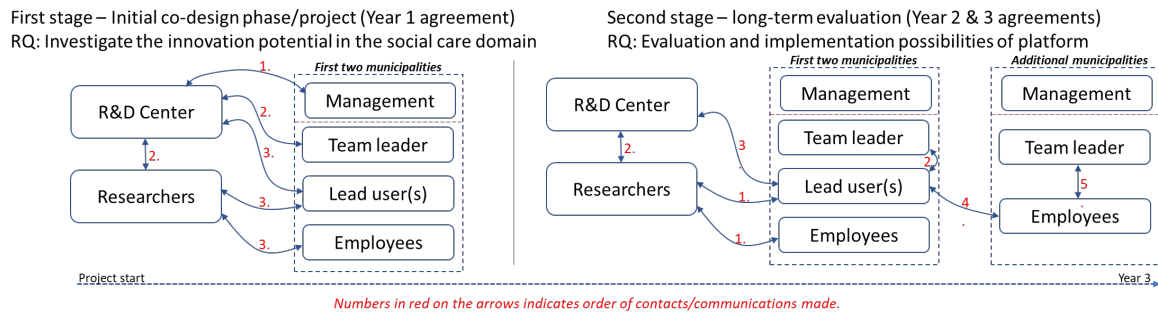


Figure 2: Commitments, actors involved and their role and evolvment during the last three years.

The second stage followed the initial co-design process and the development of the first Pycipedia version. Here the co-design team (i.e. the social workers together with us researchers) first decided to run a nine-month evaluation of the platform. The researchers discussed this with the R&D Centre while the social workers informed their immediate group leaders. The test began, without any formal agreement with the municipality top management (something we had for the first stage). One lead user with a vast network of social workers across Sweden also started to invite these social workers to become platform users. To the best of our knowledge these new users only discussed the matter with their immediate group leaders and not with any high-level manager in their respective municipality.

In this second stage we have experienced that the use of Pycipedia suffered from the lack of formal support from the participating municipalities. Especially when the initial 9-month evaluation got extended (we are now in month 30). The right side of Figure 2 also visualizes a very different commitment for year two and three compared with year one. For example have the social workers expressed challenges in having dedicated time to create materials using the platform. Due to the research setup where the scope and implications of our work changed while new partners got involved over time, we underestimated the importance of (re-)establishing formal and organizational anchoring for our work. Initially the R&D Centre managed the high-level contacts and secured resources and commitment but that was not the case for the additional municipalities who later joined the project where commitments were mainly done at a personal, social worker level.

An individual or local work group may appropriate a novel tool like Pycipedia at a 'grass-root'-level, but a more formalized top-down implementation is needed for it to scale. Especially in very open, collaborative design processes like ours a combination of a bottom-up and top-down commitment strategy should be considered.

6.3 Social workers as knowledge creators and sharers

Currently, we have 28 social workers from six municipalities registered on the platform. During the 30 months of using and evaluating the platform, eight (out of the 28 registered) people have created and shared 81 materials using the platform. In our interviews with the social workers, they expressed that they find the platform intuitive

and easy to use. For example, they do not recognize a specific need for any formal training for new platform users. Rather they suggest short and more informal onboarding activities, including colleague-based help to get started.

On the surface it does not appear to be any real issues using the platform as the social workers like the platform and finds it easy to use. Still, 30 months into the evaluation the actual platform use is limited. Based on interview-data and steering-group discussions we conclude that about half the users never, or rarely, use Pycipedia. When the social workers do use the platform, they are also predominantly consumers and not producers of content. A change in work-practice, being co-designed or not, is not appropriated overnight. As one participant puts it: "I think it is about my own way of doing things, that I [must] learn to use Pycipedia, and learn more about Pycipedia. And what components are there and how I can use them. Predominantly that, I think". To make Pycipedia work, and to support social workers in moving from being content users to content and knowledge creators one cannot consider only the platform, the people and organization using it, or the activities the platform support in isolation. Rather, we have identified the need to consider all actors, contexts and technologies together in (using Kaptelinin and Bannon's terminology) a Technology-enhanced activity space [13].

While the social workers may find the interface easy to use, our findings show that some social workers feel they do not have the time during a busy working day to create material on the platform. Instead, they tend to reuse (their own) materials they have created before. An easy-to-use interface is also not the same as the practices supported by the platform are easy to appropriate or understand. One user made for example some generic 'smiley'- faces and uploaded them to the platform image bank, and thereby created a resource that other social workers could use when creating materials on the platform. This was a great initiative, but also exemplifies some challenges with user-created content. In Figure 3 (left) we can see the user-made smiley uploaded to the platform. Materials incorporating this smiley will however be shown on a parent's small smart-phone screen and therefore one can argue that the selection of colors is sub-optimal and so is the decision to use a very thin line for the mouth. A very basic training, or even a few examples of 'screen friendly' colors and line widths, could support the user in making designs that are more screen-friendly like the examples to the right in Figure 3. The platform support participatory making and ongoing design practices, but to be successful the staff should understand and learn the implications of their designs and how they may be used by others. It should be noted that social workers are used to create materials (like pictogram-based instructions) to their clients and uses much of their professional training and experiences to develop appropriate and understandable materials for their clients. However, creating generic and reusable (digital) design resources is different, and require other skills, compared with creating the one-off paper-based materials the social workers normally produce and share with their clients.



Figure 3: (Left): Smiley made by user. (3xRight) Alternatives made considering contrast and readability on a mobile screen.

7 Discussion

In addition to the Pycipedia platform development, we have studied how the process of working with Pycipedia unfolded over a long period of time. We have organized our discussion in three categories, namely; A) Digitalization of work-tasks as both a result and a probe, B) The different project phases change the participants' roles, C) Content creator vs content consumer.

7.1 Digitalization of work-tasks as both a result and a probe

Initially in our co-design work, we got a slightly excessive picture of how often the social workers deal with PYC families and how the work with these families takes place. Our initial understanding was that everyone works in a

very similar way, but it later turned out that the social workers and their work practices are more heterogeneous. The actual implementation of Pycipedia allowed us to observe actual use and to discuss with the social workers about their work and routines at a level that the initial co-design process did not allow. In co-design there is a practice to envision future use, for example through mock-ups and enactments. However, the effects of complex and radical changes to a work-practice can be difficult to envision without actual and long-term experiences. The implementation and long-term use (and non-use) of Pycipedia allowed the social workers to reflect on their work and routines over time in ways not facilitated by the initial co-design process. In retrospect, we can see that the main result of the co-design process (the Pycipedia platform) became both a research product and a research probe. As a research product the platform was put into use and allowed social workers from different municipalities to use the platform as a work tool. As a probe, the evaluation of Pycipedia confirms that the introduction of workplace IT and the digitalization of routines change internal workflows. More interestingly, the probe also revealed that the municipality management-layers had not been actively involved in the implementation of Pycipedia. The social workers made these decisions by themselves. Since our platform is available for free and run in a standard web browser the social workers can decide to use the platform without involving the municipality organization. If the platform had required the installation of purpose-made software the municipality IT-department would have been involved and a manager would have needed to approve the payment of a platform license fee. Now the social workers themselves recruited new platform users (i.e. social workers) to the platform without the direct involvement of management. Pycipedia enables what Kapteinin and Bannon refers to as Technology-enhanced activity spaces [13] assisting social workers in creating better environments for their work and learning by combining digital and analogue work practices in new ways. That said, an important (and hitherto too marginalized) actor in the process is the municipality organization.

7.2 The different project phases change the researcher's roles

The Pycipedia study has consisted of two distinct project phases as illustrated by Figure 2 above. The first phase included a bidirectional knowledge transfer where the social workers learned about technology possibilities from us researchers and we learned about their current practice, and how they plan and perform their different tasks and activities. In the second phase we implemented the Pycipedia platform and performed an evaluation of the platform, its appropriation and use. As illustrated in Figure 2, there was a shift in our research question when moving from the first to the second phase. In the first phase we investigated the innovation potential within the social care domain while in the second phase we moved into a platform evaluation and implementation study. Looking back on our work, this shift from one research question to the other is evident but was less outspoken in the actual work process. While we had a clear co-design research question for the first phase, the second phase became more a matter of platform implementation and support. By supporting the platform and its use in the second phase we could however study the uptake, use and non-use of Pycipedia over time. In this second phase, the steering-group also became more important as we discussed the roll-out of Pycipedia, its level of use and changes needed to the platform. In the first phase, the management of the participating municipalities had approved the project and were informed about our work, this was not necessarily the case in the second phase where independent peer-to-peer recruitment among social workers were the main reason for platform growth.

We underestimated the organizational support needed for a successful implementation and use of Pycipedia. A reason for this is that we worked closely with the users, and they were positive about using the platform. But when we moved from the dedicated design process (first phase) to independent use of Pycipedia (second phase), it became challenging for some users to dedicate time and resources for actual and regular use of the system. Some users also experienced difficulties adapting work routines to fit with the digital workflow (even if they had participated in its design). Without an outspoken support from the social workers' municipalities, it will be difficult to reach a broader use and hence achieve the so-called 'network effect' where the value of platform-use increases as the number of active users increases [17].

Municipalities are not research organizations and they are mainly used to implement products, not research prototypes. Pycipedia is however not a ready-made and commercial tool. It is also a tool that will become more

useful over time and through actual use as more and more content is created by the social workers. It is therefore important that the platform users have time and resources to not only use and appropriate the platform into their everyday practice, but also that they feel they have the time to create materials using the platform. Pycipedia can be described as a 'meta-design' platform where its value is based on its users actively creating and sharing content. To support the use of meta-design platforms, we propose an active involvement of management.

7.3 Content creator vs content consumer

A question we posed while analyzing the platform and its use was if the social workers understood the profound impact Pycipedia would have on their work practice. Digital tools can be inflexible and promote certain processes and routines while hindering others. This was not sufficiently explored in the early design phase and therefore became a challenge for some social workers when trying to appropriate the tool into their everyday work. Also, initially the social workers must create more materials on the platform, as less pre-made materials exist. Over time they will however be able to find more pre-made materials. Today many social workers visit Pycipedia as content consumers but end up being content producers as they do not find the material they seek. Alternatively, they become non-users if they do not find a suitable existing material and they lack the time and resources to create a new material. Further, while the platform supports content creation via templates and a built-in image bank, it currently relies on the social workers' own knowledge and skills in developing materials suitable for their clients. To promote content creation additional support may be needed, for example online training based on design layout guidelines for people with intellectual disabilities (e.g. <https://www.w3.org/WAI/cognitive/>). As we have described above, we experienced that management was not always aware of the tool as it was introduced at a grass-root level leading to a lack of an outspoken managerial support in using the Pycipedia platform. This lack of visible managerial support did not hinder the material consumer-type use of Pycipedia but prevented planned time and resources to be dedicated so that the social workers felt they could become content creators.

8 Conclusion

With an increased use with a proper organizational backing, platforms like Pycipedia can lead to an evidence-based practice and can promote a social worker-led development of the social work profession. A core value of Pycipedia is that its use is rooted in the local, situated practice. However, it is also the local, situated practice of social workers that is one of the platform's weaknesses. Many social workers are not used to work with advanced digital tools or to collaborate across municipalities in their daily practice. Pycipedia would benefit from a work-related change in culture, or perception, among the social workers and their employers of what it entails to be a social worker with a digital work practice where collective resources and collaboration across municipalities are enabled. As such, our work with Pycipedia positions itself in a larger municipality digitalization context.

As researchers we seldom have a long-term strategy to sustain our research in a post-project phase. We often have to rely on other project stakeholders to 'take over' and maintain research work once a project ends. It is unclear to what degree a municipality or part thereof can take up such a role, especially when involving partners outside the own organization. A challenge is that Pycipedia introduces a new business model, a new way of organizing and performing social work where the creation and maintenance of collective resources across multiple municipalities is central. As researchers we must better understand how to manage long-term engagements, for example involving shared resources, together with municipalities and other stakeholders. Inspired by Kyng's work on creating sustainable post-project alternatives [14], we now explore ways of establishing long-lasting use and development of Pycipedia. We see the involvement of Lead users like the PYC instructors as fundamental both to represent the social workers in our future work and as platform-ambassadors among the social workers. To ensure a real change and digitalization of work practices that goes beyond a short-lived, co-designed prototype project we need support from the top management. We are now considering different forms of contracts to create stable agreements with various stakeholders, including municipalities. If we manage to combine a top-down and bottom-up commitment and thereby stimulate platform growth and use, we

hope that our work will not only contribute to research, but also have an impact on how social workers and municipalities will work with digitalization of workflows and collaborative work processes in the future.

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