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Amir Haj-Bolouri
Updated - AIS, amir.haj-bolouri@hv.se

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Wickedness in Designing IT for Integration Work

A phenomenological account

Amir Haj-Bolouri
University West
amir.haj-bolouri@hv.se

Abstract. In design for complex, uncertain, and ill-natured situations, it is not possible to apply known methods and solutions without having a deeper situational understanding. Such design situations are infected with wicked problems that are contradictory and complex. This paper answers the question of how the wickedness of designing Information Technologies (IT) for integration work can be understood, and what implications the design situation has for the design process. The paper employs a phenomenological account to perform interviews together with stakeholders and users known as integration workers. Based on a phenomenological analysis, four wicked problems are identified to represent the wicked design situation: Struggle of hopes and fears, Contradiction of contingency, Contradiction of social presence, and Uncertainty of reliance. The wicked problems are subsequently addressed as interrelated and have implications for the design process, which is enframed through four proposed design implications: IT for subtle decision makings, IT for cross-boundary interaction, IT for disclosing proximity and distance, and IT for increased empowerment. The implications incorporate a holistic design ontology, which also shows the viability of phenomenology for studying, describing, and understanding how to tackle situational wickedness in design-oriented Information Systems (IS) research.

Key words: integration work, wicked problems, wickedness, design, design research, phenomenology.

1   Introduction

Integration is a grand challenge that affects and concerns many nations, societies, and people all around the world (Eastmond 2011). Worldwide, millions of people have been (and still are) forced to leave their home countries due to a number of critical reasons including: hostility, war, poverty, violence, and persecution (Valenta 2012). As a result, countries all around the world have faced a large number of newly departed immigrants and refugees (also known as: newcomers) entering their society. A good example of such society is Sweden, which faced and received a large number of newcomers (SCB 2018) during an intense period of time between 2013-2016 (Vesterlind 2016). Consequently, in order to face challenges of integration sufficiently, and to support the integration process of newcomers in society, integration work was (and still is) employed and undertaken by Swedish authorities and municipalities.

Integration work is a practice and welfare domain that tackles challenges concerning integration (Dahlström 2006; Goodman 2012). Such issues include challenges dealing with: the social integration of newcomers in society (Asselin et al. 2006; Martinovic et al. 2009); education that incorporates newcomers' participation in various areas of the social world (e.g., education, labor) (Eastmond 2011); or civic processes that promote the possibility for newcomers to engage civically and orient themselves into the society's worldview (e.g., norms, values, laws) (Vesterlind 2016; Yohani 2013). Moreover, as society keeps to become digitalized through design and use of Information Technologies (IT) (Gregor & Hevner 2013; Hevner et al. 2004; Majchrzak et al. 2016), an increasing interest among scholars in the field of Information Systems (IS) (e.g., AbuJarour et al. 2016; AbuJarour & Krasnova 2017; Andrade & Doolin 2016; Schreieck et al. 2017) has been shown for how to design and introduce IT that supports integration in general.

ITs represent artifacts that together serve a bundle of technologies which aim to support organizations, societies, and people (Lee et al. 2015; Orlikowski & Iacono 2001), and represents an essential asset of doing IS research (Sein et al. 2011; Whinston & Geng 2004). In order to design IT for any practice that deals with a grand societal challenge, one is acquired to understand the particular situation and its underlying circumstances for which technology is to be designed for (Hevner et al. 2004), and used in (Leonardi 2012; Orlikowski & Iacono 2001). At this stage however, it is uncertain how to design IT for integration work sufficiently, because integration workers (those who work with integration work) face challenges that are contradictory, incomplete, or constantly changing (Ekström & Östman 2013; Vesterlind 2016). Such types of challenges are generally referred to as wicked problems (Rittel & Webber 1973), because they are unstable, uncertain, and highly dynamic in their nature, making it difficult to solve them through a given set of a priori solutions (Coyne 2005).

Given the background so far, the research aim of this paper is to understand the design situation when designing IT for integration work. Consequently, the research aim is focused into two specific objectives: (i) explicating the wicked nature of integration work via the perspectives of integration workers, being the people who on daily basis work with challenges concerning the integration process of newcomers; and (ii) identify implications for designing IT for integration work. Consequently, the following research question is formulated and proposed to guide further research activities:

How can the wickedness of designing IT for integration work be understood, and what are the implications for the design process?

The research aim, and formulated question, are relevant for the IS field due to a number of reasons: first, wicked problems and design of IT are IS phenomena that have been studied by scholars for decades (Lindberg 2018; Schoder et al. 2014; Westbrook 2007) in IS, and they pertain to be driving factor of design-oriented IS research in particular (Hevner et al. 2004; Sein et al. 2011); second, integration is a grand societal challenge that is relevant to tackle through IS research (Andrade & Doolin 2016; Majchrzak et al. 2016) because of the unstable and uncertain challenges that comprise integration of human beings in societies; third, integration work is an important and primary area of work that supports the integration process (Goodman 2012) by encountering many of the unstable and uncertain challenges of integration (Asselin et al. 2006; Martinovic et al. 2009); and fourth, tackling the challenges and problems of integration through design of supportive IT is critical for supporting those who work with integration work (AbuJarour et al. 2016; Vesterlind 2016).

In order to understand the wickedness of designing IT for integration work, and subsequently propose sufficient design implications for the design process, a deeper understanding of the design situation and its circumstances were explored and elucidated through a phenomenological account. In short summary, phenomenology helped: (i) exploring and establishing an immediate understanding of the wicked design situation by entering the lifeworld (e.g., feelings, fears, expectations, perspectives) of integration workers; (ii) identifying wicked problems and their circumstances which constitute the wicked situation; and (iii) proposing design implications for the design process. The contribution of this work is targeted as unveiling the wicked design situation of an area that is of crucial nature for understanding grand challenges of society, dealing with a profession that focuses human beings, their well-being and future in a host society. Consequently, by unveiling the wickedness of the design situation, this paper contributes to IS research theoretically by showing that phenomenology is a viable ap-

proach for design-oriented IS research that focuses wicked problems and grand societal challenges.

The rest of the paper is organized as follows. First, related research will be presented on the nature of wicked problems, integration as a wicked problem, and design as a remedy for integration as a wicked problem. Second, the phenomenological account will be outlined. Third, based on the presented phenomenological account, the research setting, participants of the study, and approaches for data gathering and analysis are presented. Fourth, the findings of the study are presented in form of identified wicked problems. Fifth, the findings are discussed and design implications for the process are proposed. Finally, the paper concludes with highlighting the contributions and limitations of the study.

2   Related research

This section presents related research on wicked problems, discusses integration as a wicked problem, and outlines how design has been used as a remedy in prior research to tackle wicked problems.

2.1   Wicked problems

When designing IT for integration work, the design situation contains unique challenges and complexities, for example related to coordinating and performing social processes that promote the possibility for newcomers to engage civically in society (Vesterlind 2016). Such challenges are dynamic and unstable, without any natural or immediate solutions, making them wicked by nature.

The concept of wicked problems was initially described by Rittel (1972) and Rittel & Webber (1973) to distinguish typical problems from those that are much more complex and ill-natured. The difference between typical, simple problems with established procedures and wicked problems, is that wicked problems do not have clear solutions; it is not always possible to know when or if they have been solved, and they are not possible delineate nor clearly define (Rittel & Webber 1973). Essentially however, wicked problems are characterized by attributes and features that impose them as unique, unstable, contradictory, ambiguous, without any pre-defined categories attached to them, making them highly complex and difficult to solve permanently. Burge & McCall (2016) have critically examined the nature of wicked problems by re-emphasizing the following four features:

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1. First, Burge & McCall (2016) highlight that there is a cause-and-effect relationship between wicked problems, and that identifying cause and effect relationships is the main focus in handling them

2. Second, Burge & McCall (2016) revise the notion put forward by Rittel (1972) that trial-and-error cannot be used when solving wicked problems

3. Third, in relation to the second feature, Burge & McCall (2016) highlight that previous projects can inform future projects, which was also refuted in the original work of Rittel & Webber (1973)

4. Fourth, Burge & McCall (2016) conclude that wicked problems always have unforeseen implications, and this capricious nature of wicked problems is what causes the primary difficulty of solving them

Examples of wicked problems that manifest the above-mentioned features vary in a wide range of real-world problem-solving fields, including software engineering (DeGrade & Stahl 1990), interaction design (Stolterman 2008), systems engineering (Kovacic & Sousa-Poza 2013), architectural design (Fischer et al. 1996), environmental policy (Balint et al. 2011), health care (Arnett 2012), management science (Dunne & Martin 2006), and IS (Hevner et al. 2004; Lindberg 2018). Consequently, this study accumulates research on wicked problems by emphasizing integration as a wicked problem. In the next section, the four presented features of wicked problems are emphasized and applied to elucidate how and why integration is classified as a wicked problem.

2.2   Integration as a wicked problem

Besides being a grand challenge that affects nations, societies, and people all around the world (Eastmond 2011), the nature of integration resonates with the four features of wicked problems presented by Burge & McCall (2016).

First, the need of integration emerges and is caused by a number of different factors, such as war, poverty, and persecution of newcomers in their home countries (Goodman 2010), economic growth (e.g., newcomers contribute with work and become integrated with the labor market) (Vesterlind 2016), cultural prosperity (e.g., society's social lifeworld incorporates values and perspectives from a multitude of different cultures) (Valenta 2012), or integration policies (e.g., EU's policies and agreements to help refugees and immigrants in their new host societies by serving them their human rights) (Yohani 2013). Consequently, the effects are driven by integration work and rooted in establishment programs such as civic orientation, language training, or other governmental initiatives that are provided to the newcomers by their host society.

Second, the initiatives of integration work (e.g., civic orientation, language training, and more) have undergone a process of trial-and-error, generating knowledge about how crucial issues make it difficult for societies to achieve sufficient integration. Such issues include measures such as training (e.g., language barriers make it difficult to train newcomers at work), housing (e.g., difficulty for newcomers to acquire their own residency), education (e.g., degrees and diplomas from prior education in home countries are not always sufficiently accepted in newcomers' host societies), work (e.g., difficulties in acquiring a job), and the fact that none of these alone can ensure successful integration (Asselin et al. 2006; Eastmond 2011; Valenta & Bunar 2010).

Third, a body of knowledge about the interplay between technology and integration has been accumulated over time through IS research, where examples of how reflection and learning from past research projects are incorporated into new ones, vary in terms of complexity and problem area. For example, Andrade & Boolin's (2016) study shows how IT supports the social inclusion of refugees in New Zealand, whereas studies by AbuJarour et al (2016) and AbuJarour et al (2017) elaborate the discourse and emphasize actionable recommendations for policy-makers in their efforts to achieve successful integration through IT and social media. Examples of additional studies, which draw inspiration from prior mentioned ones, emphasize how IT enhances resettled refugees' well-being and participation in their new host society (Andrade & Doolin 2019; Bustamante-Duarte et al. 2018).

Fourth, initiatives of supporting integration through various means, including technology and integration work, has generated unforeseen implications for research and practice. For instance, governmental initiatives for integration work have generated unforeseen implications such as: the need of digitalizing civic orientation programs in Sweden to increase the availability of the program nation wide, and to offer IT that enable integration workers to collaborate, communicate, and interact sufficiently with each other and newcomers (Vesterlind 2016). Other studies (e.g., Kaufmann 2018; Montgomery et al. 2004; Raynes-Goldie & Walker 2008; Schreieck et al. 2017) have over time elucidated unforeseen implications of incorporating integration through technology, such as web-based resources that support integration process of immigrants, non-profit platform ecosystems for refugees, how newcomers use smartphones to navigate in their new host society.

2.3 Towards design as a remedy for integration as a wicked problem

To summarize so far, the four features of wicked problems presented by Rittel & Webber (1973), and re-examined by Burge & McCall (2016), have helped understanding

the nature of integration as a wicked one, with integration work as the main practice and initiative that supports the integration process. Prior research in IS (e.g., AbuJarour et al. 2016; Andrade & Doolin 2016; Bustamante-Duarte et al. 2018) have demonstrated how and why IT is a supportive means for the integration process in general, whereas more knowledge on how design of IT can support integration work in particular, is limited (Goodman 2012; Vesterlind 2016). Hence, this section advances a discussion towards design as a remedy for managing and resolving wicked problems in general, with a particular focus on how design of supportive IT can serve as a remedy for identifying and managing the wickedness that is inherently built into the context of integration work; it is inherently so because integration work deals with all of the problems related to integration as a phenomenon.

The specific instance of wicked problems that is of interest for this study is integration as a wicked problem. But in order to contribute to the broader discourse of a wicked problem (in this case, integration), one needs to identify and unveil the root causes of that wicked problem (Burge & McCall 2016). One way of finding the causes of a wicked problem is aligned with finding the solution because a wicked problem cannot be defined until the solution has been found (Rittel & Webber 1973). Design as an activity and a process is problem-solution oriented by nature (Nelson & Stolterman 2003), aiming to produce viable solutions (e.g., IT-artifacts) and knowledge (e.g., design implications, principles) that solve specific problems as well as a class of problems (Hevner et al. 2004). Design has thus been a focal point and remedy for strategically identifying, managing, and solving wicked problems (McCall & Burge 2016).

Dealing with integration as a wicked problem, and the circumstances of which it emerges from, is a process that integration workers deal with on a day-to-day basis in their profession (Goodman 2012; Vesterlind 2016). Entering the integration workers' lifeworld, understanding the context of integration work, and how integration workers deal with challenges of integration, are aspects that inform how and why integration is a wicked problem. Subsequently, design as a remedy offers a creative and sufficient way to enter the wicked situation of integration workers and unveil how and why the wickedness emerges, because a researcher can facilitate a process that moves towards a deeper understanding of the nature of a wicked situation (Nelson & Mandela 2003; Hevner et al. 2004). Examples of approaches and studies that confirm such are many and vary from: design thinking (Buchanan 1992: 2010; von Thienen et al. 2014), to Design Science Research (DSR) (Hevner et al. 2004; Gregor & Hevner 2013; Pries-Heje & Baskerville 2008), to the use of game design to increase awareness of climate change (Coulton et al. 2014), participatory design for designing sustainable communities (McGinley & Nakata 2012), to using user-centered design tools (e.g., personas) for re-

ducing ICT4D project failures (Peter 2015), or to other user-involved design processes for technologies that help people diagnosed with schizophrenia (Lindberg 2018).

A common denominator among many design studies and approaches that deal with wicked problems, including the ones mentioned in the previous paragraph, is that the design process is undertaken by a team of designers, stakeholders, users, and researchers through a collective inquiry (Brown 2010; Farrell & Sein et al. 2011; Hooker 2013). Together, the team considers the design situation both holistically (e.g., context, practice, organization) and analytically (e.g., cause, implication), to identify and understand the circumstances of which the wicked problems emerge from; that is, to not only emphasize on the specificities of the identified problem but also on the nature of the circumstances within which the problem resides (Nelson & Stolterman 2003). Furthermore, becoming familiar with the wicked design situation early on in a project is also an important step in better utilizing the empirical material (e.g., interview data, observations) in order to manage the wicked problems (Alvesson & Kärreman 2007)—because design problems are by nature wicked (Ermolaeva & Ross 2010; Mansfield 2010),

The design situation of designing IT for integration work in particular is however an unknown territory due to lack of prior research (Vesterlind 2016). The circumstances of the situation are concealed making it difficult to properly address the wicked problems of the situation, their cause, and implications for the design process. Consequently, alternative approaches (e.g., interventions, workplace learning) to design that deal with challenges and problems (although not explicitly addressed as wicked ones) of integration work are few (Vesterlind 2016), and focus the use of supportive technologies (AbuJarour et al. 2016; Andrade & Doolin 2016; Bustamante-Duarte et al. 2018), rather than dealing with wicked problems through design. Hence, in order to gather more knowledge about the wicked situation of integration work, its circumstances, and propose implications for design as a remedy, this study stresses the need of entering, exploring, and unveiling the lived experiences of integration workers that encounter the wicked situation on daily basis.

3   The phenomenological account

Current knowledge about how to design IT for integration work sufficiently, is limited (Vesterlind 2016). Due to the wicked nature of integration in general, the design situation, together with its underlying circumstances, are at this stage concealed, yet available for further inquiry. In order to enter the situation, understand the nature of it, and unveil its circumstances, this study employed a phenomenological account. Hence, in order to explicate the phenomenological account, this section outlines phenomenology

as a research approach, application of phenomenology in IS, and the methodological considerations of phenomenology

3.1 Phenomenology as a research approach

Phenomenology is understood and practiced in a variety of different ways today, but its use as an approach of social science springs primarily from the works of the founder Edmund Husserl (1931), as well as other well-known philosophers such as Martin Heidegger (1962) and Merleau-Ponty (1982). Husserl in particular dedicated his philosophical inquiry to develop a sound foundation for phenomenology as an approach of guaranteeing knowledge, so that other scholars could reliably use the phenomenological approach in a broad range of sciences, including IS (Boland 1985).

Indeed, it is difficult to define phenomenology in way that will cover all its diverse traditions and trajectories (Spiegelberg 2012). Initially however, phenomenology may be described as an effort to disclose the transcendental features or presuppositions of the world as given in ongoing experience (Zahavi 2018). Consequently, the core focus of a phenomenology study is to understand and unveil the nature (also referred to as essence) of experience (Lyotard 1991), by entering the lifeworld (e.g., inner world of a human being, feelings, emotions) of human beings (Zahavi 2003). The search for the nature of experience is the search for meaning, and phenomenology is therefore concerned with the structures of meaning that give sense and significance to one's immediate experience of a situation, information, or phenomena in general (Cornelius 1996; Husserl 1962; Moran 2000).

Further, phenomenology belongs to the interpretive perspective of research because the nature of experiencing a situation is unveiled through interpretation similar to the hermeneutical exegesis (Boland et al. 2010), where beliefs about the social reality is emergent, subjectively created, and objectified through human interaction (Chua 1986). Hence, in contrast to a positivistic account that mainly is concerned with finding out how things work, a phenomenological account is concerned with finding out what things are through its reflexive character. The reflexive character means that phenomenology is not a finished approach that can simply be used, because one is always a beginner with the phenomenological approach (e.g., interpretation is an on-going and iterative process) (Zahavi 2003). From this perspective, phenomenology directs scholars to engage in a sense-making process (Weick 1995) in order to understand, unveil situations and their circumstances, through enactment, communication, and a perspective making/taking (Boland & Tenkasi 1995).

3.2   Phenomenology: application in Information Systems

The use of phenomenology in IS research has been limited, but there exists a number of studies that advocate or apply phenomenology to IS, including the early works of Boland (1985) and Ehn (1988), to later examples in the literature (e.g., Ciborra 2002; Introna & Whittaker 2003; Mingers 2001; Mwadulo & Odoyo 2020; Riemer & Johnston 2014; 2017). Overall, one might describe the employment of the phenomenological approach in IS, as:

> […] a recursive process of ontological disclosure in which a world (nexus of relevant social practices) and technology (nexus of socio-technical relations) are taken as mutually constitutive interpretive contexts in which the one renders the other intelligible—i.e., grounds it as a seemingly meaningful way to be. (Introna 2008, p. 12)

Applied to the context of design, phenomenology suggests that IS scholars need to move a way from the idea that they can design for the immediate quality of an experience, towards the understanding of what constitutes experience in terms of its situation and circumstances (Bakhtin 1993; Andrade et al. 2017).

A phenomenological approach in IS deviates from the traditional deterministic view on design and technology, which traditionally advocates dualisms of subject/object, mind/body, and cognition/action (Riemer & Johnston 2014). Instead, an application of the phenomenological approach involves interpreting and rendering an encountered situation, where a progressive uncovering of the situation's circumstances is undertaken to unveil particular ways of seeing or doing (Boland et al. 2010). Hence, in the study of design and technology, the phenomenological approach is grounded in the idea of enframing the design process: design of technology does not answer any particular question, but instead "[…] enframes the world such that the question is changed along with the answer." (Arnold 2003, p. 236). For example, designing the word processor is not only about designing a processor that is just a more efficient way to write, but also changes the question of what writing is: from craft to system of production (Lyman 1984).

3.3   Phenomenology: methodological considerations

Phenomenological research is about discovering meaning and describing lived experiences. Researchers should thus approach a phenomenological inquiry by identifying a specific experience that the researchers are deeply interested in with an intense

desire to understand that experience (Sokolowski 1999). A phenomenological problem is generally formulated around the "[…] lived experience of human phenomenon that is experientially recognizable and experientially accessible" (van Manen 2016, p. 297)—i.e., what is the nature of the phenomenon as meaningfully experienced? In IS research, a legitimate phenomenological inquiry would thus concern the experience of a socio-technical situation (e.g., situation that incorporates the relationship between humans and technology), which is encountered through acts of communication (e.g., dialogue, interviews), and interpreted through acts of analysis (e.g., interpretive schemes)—i.e., Introna & Whittaker's (2003) study about overcoming the subject/object dualism in IS evaluation or Andrade et al's (2017) phenomenological study about technology experience.

It is important to re-emphasize that phenomenological research seeks to unveil the "[…] existential empirical meaning structures of a certain phenomenon" (van Manen 2016, p. 348). Therefore, operationalizing phenomenology as a methodology would mean that the researcher needs to employ specific research methods (techniques) that enables him/her to engage, explore, unveil, and interpret the situation of which he/she is encountering. Such methods are typically qualitative by choice and include in-depth interviews, transcription of the empirical material, line-by-line coding of the transcribed material, axial coding of the relationships between identified themes, and memo writing (Eatough & Smith 2017; Smith et al. 2009).

In summary, even though the application of phenomenology has been limited in prior IS research, some of the benefits that can be realized for this study by its application include:

Uncovering the lived experience: getting an in-depth insight of experiences in a multifaceted and comprehensive manner (Sokolowski 1999; Zahavi 2003). This point is beneficial because the circumstances of the wicked design situation are currently concealed within the lifeworld of integration workers, and in order to unveil the circumstances of the situation, one needs to uncover the experience of the situation which is located in the lifeworld of the integration workers.

Justifying the study design: Phenomenology provides a theoretical and philosophical framework as well as a consistent methodology and methods (van Manen 2016). This point is beneficial because it helps justifying (and framing) the study design of this research in a structured and cohesive way, by ensuring that there is a linkage between theoretical perspectives of phenomenology (e.g., concepts such as lifeworld, enframing) and methodological considerations (e.g., qualitative research methods).

Clear research guidelines: Phenomenology provides clear guidelines on sample selection, data collection, data analysis, and validity, which facilitate its adoption to IS re-

search (Eatough & Smith 2017). This point is beneficial and important for the data collection and analysis process because it enables this research to utilize the methodological considerations of phenomenology, through specific research activities and methods.

Enframing the design process: informs and frames the implications of the design process holistically through a non-dualistic ontology of technology (Riemer & Johnston 2014), where the relationship between humans and IT is conceptualized as an integral 'equipment' of human beings and their ways of interacting with the world (Riemer & Johnston 2017). This point is beneficial and sufficient for approaching the design process in a holistic manner as it was experienced by the integration workers (e.g., what is experienced as being wicked about the situation), rather than approaching the situation through a positivistic manner that emphasizes a dualism between their experience and the situation as a detached thing that is free from prior experiences (e.g., how is the situation wicked).

4   Methodology

Given the circumstances and research focus of this study, and the relevant benefits of employing a phenomenological account, phenomenology was chosen as an overarching methodology. The methodology organized around two specific research activities: data gathering and data analysis. As will be described further in this section, the research activities were performed in a particular research setting together with the integration workers as involved research participants. The activities are however not meant to be read as formal steps for a researcher to follow, because it is not possible to separate phenomenological inquiry from its roots in various philosophical orientations (e.g., transcendental or hermeneutic traditions) that it draws from (van Manen 2016).

4.1   Research setting

This study was performed as part of a larger research project that was held between 2014-2017, aimed to design and introduce IT for the civic orientation program. The civic orientation program is in turn a special case of integration work, with the core purpose of informing newcomers, fundamental knowledge about the Swedish society (Vesterlind 2016). Consequently, the newcomers attend 60 hours of civic orientation as a part of their overall establishment program. Here, the newcomers are obligated to attend and be present at the sessions, whereas they don't need to perform any formal exams or test in order to pass the program. Rather, teaching and learning is mediated through social interaction (e.g., dialogues, exercises, discussions) among the newcomers

and the tutors. Due to the needs of intervention and implementation of IT which support integration workers in their tasks, and which help the civic orientation program to expand and become available nationwide through e-learning technologies, the research project included several cycles of design and evaluation activities.

4.2 Participants

The participants of this study that participated in interviews were integration workers, which are people who work with political questions, psychological challenges, and social problems of integration. The integration workers are highly relevant participants of the project and were chosen for this study because of a number of reasons.

First, they are experts and representatives of the integration center, an instance of society that is primarily created for managing integration work in Sweden. Second, all of the integration workers have, to this date, over 8 years of professional experience in their work, being the ones who primarily handle groups of newcomers from all around the world in one of Sweden's biggest cities and county. Third, some the integration workers (e.g., tutors) have themselves been newcomers in society and thus have a first-hand experience of the lifeworld of newcomers and integration process; having access to respondents' first-hand experience of a phenomenon is of crucial nature for phenomenological inquiries of such (van Manen 2016; Eatough & Smith 2017). Fourth, the integration workers possess different roles and areas of responsibilities that deal with a wide range of questions concerning integration, including: education about society, content development for civic orientation, mentoring newcomers, exercises that simulate questions concerning daily life in Swedish society, and more.

Table 2 depicts the integration workers' fictive names and their respective roles; their names have, due to the purpose of preserving their integrity, been changed for this study (as shown in Table 2). Newcomers were not involved as participants of this study due to time limitations, language barriers, and lack of interest.

Tutors are individuals that are employed by the integration center to educate, inform, and help the newcomers, through the newcomers' native language (e.g., Farsi, Arabic, Somali, etc.). The tutors are also those who enter the lifeworld of tutors and navigate them through both psychological challenges (e.g., fear, sense of uncertainties) and social problems of the integration process; tutors are themselves carriers of stories, experiences, and rich amount of both professional and personal insights that help newcomers in their daily lives as future citizens. Different tutors adopt and employ different pedagogical methods to convey topics of civic orientation to the newcomers. The topics vary and include knowledge about various aspects of the Swedish society such as: how

Participants	Participant Role
Anna	Tutor
Hazim	Tutor
Ken	Tutor
Emma	Tutor
Albert	Coordinator
Nora	Coordinator
Paris	Project manager

Table 2. Overview of participants

to apply for job in Sweden, how does the education system work, what is democracy, what are your human rights, which laws and regulations shall you follow, what norms and values do the Swedish society appreciate, etc.

The tutors are themselves immigrants, meaning that they all have different backgrounds, culture, experiences, etc. which they use to create a bridge of knowledge between newcomers' worldview (e.g., belief, expectations, values) with society's worldview. The tutors are thus the integration workers that interact the most with large groups of newcomers. The coordinators however, are employed on a full time basis at the integration center to coordinate essential activities within the program such as, scheduling of sessions, distribution of teaching material, arranging workplace excursions (e.g., visiting a company), etc. They play a crucial role in terms of managing the political side of integration work, together with the project manager which acted as a key stakeholder that was mainly the interface and contact person with the principal researcher of this study.

4.3   Data gathering

Phenomenology looks into the lifeworld to find lived-experience materials (Sokolowski 1999). Data may come from interviews, daily accounts of stories, written responses, or diaries, among others (van Manen 2016). It is important to recognize that the gathered data are experiential accounts of lived experiences rather than the lived experience itself. Phenomenologists approach thus interviews with a conversational attitude where both the researcher and the participant perceive each other as peers (Aspers 2009). In other words, a phenomenological interview or series of interviews are similar to having open

conversations with friends. Participants are not just informants or subjects; they become co-researchers (Moustakas 1994). Therefore, questions during the interviews shall aim to obtain a rich description of the experience as it was lived by the co-researchers (van Manen 2016).

The interview is considered the main method of data gathering in phenomenological research as it provides a situation where the participants' descriptions can be explored, illuminated, and gently probed (Jasper 1994; Kvale 1996). In a phenomenological setting, it is important to conduct interviews in order to explore and illuminate the richness of each respondents' lifeworld, by prompting questions that unveil elements of their experiences and rich insights of a phenomenon. Hence, the specific empirical material of this study was thus gathered through a study design that comprised seven phenomenological interviews.

The interviews were structured and followed the three-stage process of Seidman (1991): (i) establishing the context of the interviewees experience, which in this study concerned the lifeworld of integration workers and their experience of the wicked situation; (ii) a construction of their experience through conversations; and (iii) reflecting on the meaning that their experience holds for understanding the wicked design situation and implications for the design process. The two first points were addressed via the interviews through a central question that reflects the research setting, integration workers' experience of the wicked situation as object of inquiry, and which lead to conversations about their lived experience. The question was essentially the same as the research question of this study, yet articulated a bit different as follows: *what do you experience as being wicked about the situation of integration work, and in what ways could IT help the situation?* The term wicked was subsequently elaborated and explained according to the literature (Burge & McCall 2016; Rittel & Webber 1973), in order to establish a proper understanding around the question. As Hardy & Ford (2014, p. 140) explains, reaching an understanding together with the respondent is an important and complex task which needs to be stressed when introducing terms or asking questions:

> If the respondent does not understand the survey question is exactly the same way as the researcher then the instrument is not measuring what the researcher intended. This interface between researcher and respondent is of critical importance and where linguistic problems of interpretation manifest themselves. Communication depends on one person's statements being understood by another. This, however, is not enough, as understanding what another person is saying is one thing, while understanding exactly what they mean is another.

The third and final point of Seidman's (1991) three stage process (reflecting on the meaning) however, was addressed through an Interpretative Phenomenological Analysis (Eatough & Smith 2017), which will be described in the next section.

4.4   Data analysis

An Interpretative Phenomenological Analysis (IPA) is concerned with analyzing and interpreting the detailed examination of personal lived experience (Eatough & Smith 2017). Originating in the 1990s as an approach to the psychology of experience, IPA has been adopted and employed in several different fields including organizational studies (e.g., Tomkins & Eatough 2014), education (e.g., Denovan & Macaskill 2013; Thurston 2014), health (e.g., Cassidy et al. 2011; Seamark et al. 2004), and the humanities (Hefferon & Ollis 2006). Furthermore, IPA has its roots in the stream of hermeneutic phenomenology advocated by philosophers such as Heidegger (1962) and Gadamer (1990).

The IPA process stresses thematization to discover themes that serve as the structures of meaning of the lived experience. Here, thematization follows initial noting and exploring the themes that describe the lived experience (Smith et al. 2009). For this study, the steps of the IPA process were performed iteratively throughout the analysis process, and relied heavily on open coding and axial coding of the data. Subsequently, the thematization process was undertaken as Seidman's (1991) third stage of reflecting on the meaning of integration workers' experience with the wicked situation.

In accordance with the guidelines of employing and performing IPA (Eatough & Smith 2017), the individual interviews were all transcribed and coded line-by-line using open coding. The codes were subsequently formulated closely to the original wording, preserving a *pure* (honest) relation to the empirical material, and they were grouped into categories using focused coding. Furthermore, following Eatough & Smith's (2017) recommendation of performing the analysis iteratively in order to identify themes, identification of categories was done by using the most significant (mostly occurring, present) codes as an entry-point, and then iterate the codes to identify emerging themes. Examples of themes included: 'being forced to', 'fearing change', and 'being uncertain'.

The relationships between the identified themes were axially coded. Axial coding enables a sense-making of the relations between themes and codes, in order to return a comprehensive perspective on the data (Smith et al. 2009; Eatough & Smith 2017). This task was accomplished by using the software Nvivo 12 to create visual mappings. For example, the theme being forced to related to the theme change because change

mediates a feeling of being forced to the implications of change. Consequently, it was at the axial coding stage that a set of specific wicked problems were identified.

A total of 48 memos were written throughout the analysis process, because memos are an important part of axial coding as they function as a tool for analysis, theory creation and idea generation (Eatough & Smith 2017). In this study, the memos were important for documenting insights and interpretations throughout the analysis, which included reflections and learning on the contradictions that emerged. The IPA process and its constitutive elements are summarized in Table 3.

Activity	Outcome	Example
Transcription	Direct transcriptions	N/A
Line-by-line open coding	712 codes formulated closely to the original wording	enabling transparency, increased cultural awareness, using storytelling
Focused coding grouping	19 themes based on the most significant codes as initial point	being forced to, having heterogeneous needs, fearing change, being uncertain
Axially coded relationships	Mapping of conflicting or contradictory themes. 4 wicked problems and design implications were identified	enabling transparency relates to learning outcomes unwritten laws since the latter one is tacit until someone/something explicates it
Memo-writing	48 memos for documented insights and interpretations	"In order to become socially integrated in a society, one needs to cross cultural boundaries and be able to learn the unwritten laws, such as norms and values, of that society. However, many times it is typical that one is fearing change and risk to stay segregated. This is contradictory in some sense if one wants to become socially integrated…"

Table 3. Overview of the IPA process

Finally, the outcomes of an IPA process are, in similar ways as a grounded theory approach (Annelis 2008; Reiter et al. 2011), reported in a narrative form (Eatough &

Smith 2017). The narrative form incorporates a combination of: an overall description of the theme, category, or in this case, wicked problem; detailed descriptions that are extracted from the transcribed material and provided in a pure form (e.g., excerpts from interviews); and a distinct summary of the narrative.

5   The wicked design situation

This section presents the findings from the phenomenological interviews and analysis in a narrative form, accordingly to the guidelines of reporting outcomes of an interpretative phenomenological analysis (Eatough & Smith 2017). The analysis of the empirical material identified four wicked problems that, together, represent the wicked design situation. Table 4 summarizes and depicts an overview of the identified wicked problems, whereas a detailed presentation of each wicked problem will be performed in subsequent sections below the table.

5.1   Struggle of hopes and fears

The interpretative phenomenological analysis unveiled the first wicked problem as 'struggle of hopes and fears', a sensation that the integration workers carry and experience in their lifeworld regarding the future of integration. The analysis showed that the integration workers experience a tension between having hopes and fears due to a number of reasons, including: being forced to adapt to strict political decisions that determine the discourse of integration work, working under unstable circumstances (e.g., part time, multiple groups of classes), or being stressed up because of frequent encounters with ill-natured challenges (e.g., conflict among newcomers in classroom, conveying information that can be experienced as sensitive by newcomers).

Throughout the course of the phenomenological interviews, several integration workers shared stories about their lived experiences with the wicked problem. The tutor Anna elaborated her struggling experience as:

> We want to help all newcomers do their best to live a good life here in Sweden, but we must always adapt to the political situation, fast decision makings of authorities that affect our work, and high pressure on including more and more newcomers in the program because currently we are the only instance in Sweden that provides civic orientation.

Wicked problem	Description
Struggle of hopes and fears	Integration workers are under a constant pressure due to dynamic working hours, working with a large group of heterogeneous people, and facing unstable challenges that emerge due to the global situation of immigration in general. Uncertain decision makings that stem from an interplay between political priorities, and scarcity of resources for supporting integration of newcomers in society, create a tension between hopes and fears about the future
Contradiction of contingency	Working with integration creates contingency. Political systems and authorities do not always support local ideas of integration workers, forcing them to follow conventions and decisions from above in the authority latter. At the same time, integration workers are supposed to produce innovative solutions that are free from standards and conventions from above
Contradiction of social presence	Being socially present by engaging in interaction through dialogues, reinforcing teaching sessions about society through personal reflections, and exchanging learning outcomes from own life experiences, are all important factors for integration workers in order for them to sufficiently support newcomers' integration process
Uncertainty of reliance	Integration workers feel reliant on political organs that make operative decisions on how to distribute supportive resources for integration in society, whereas the newcomers feel reliant on authorities' and integration workers' expertise

Table 4. Summary of the identified wicked problems.

Other integration workers, such as Nora, felt hopeful about the future of integration, especially from the perspective of digitalizing the civic orientation program:

> We are in some sense pioneers because we are the only initiative in Sweden that has the ambition of supporting integration through IT by digitalizing the civic orientation program. I thus hope that our work will decrease some of the current challenges…. I mean, the ones that are putting us under lots of pressure… and I also hope that it benefits the newcomers' learning experience.

Another aspect of the wicked problem dealt with the fear of failing to support new-comers with their integration process. This is a struggle that has created a great amount

of psychological pressure among the integration workers. Paris, the project manager, elaborated on this problem by saying that:

> We are only human beings doing our best to help newcomers become a part of society, and we are doing this under a lot of pressure, with low salary, and many unpredictable challenges and obstacles to deal with… but it is the fear of not doing enough that is worst.

During the interview with Paris, the conversations raised questions about the future role of IT, how technology can help the integration workers resolving some of the challenges and obstacles in their work, and what the expectations are. As a response, Paris replied:

> Some of us are experienced users of IT, whereas others are not, so we have a pretty good idea about our competency level… the newcomers however are very heterogeneous, making it impossible for us to determine how IT-literate or illiterate they are… besides, they are already pressured about their current life situation, so why should they put additional time on learning new technologies?

In summary, the phenomenological analysis unveiled the circumstances of the first identified wicked problem (struggling with hopes and fears) through a number aspects: (a) the dynamic landscape of integration in general generates unforeseen challenges for the integration workers; (b) the integration workers have fear about the future of integration, with a minimum sense of agency to affect the overall situation; (c) the integration workers expressed a need to incorporate their work through IT, but at the same time, they have a fear for introducing new technologies to the newcomers; (d) some of the integration workers feel personally responsible for helping newcomers to become a part of Swedish society; and (e) the administrative overhead and pressure that are externally projected towards integration workers' profession (e.g., expectations from political organs and society in general), has created a tremendous amount tension that has led many of the integration workers to exhaustion.

5.2 Contradiction of contingency

The phenomenological analysis further unveiled a second wicked problem, this time concerning a 'Contradiction of contingency'. Contingencies emerge in the realm of integration work due to the global situation of immigration crisis, together with the

political discourse concerning integration in Swedish society. On the one hand, integration workers' liberty of making independent choices is always dependent on a ruling government, policy makers, and influencers in society that affect people's lifeworld (e.g., feelings, opinions, values) concerning integration and immigration. On the other hand, the integration workers have creative freedom to arrange and perform work activities that engage newcomers to learn descriptive knowledge about society (e.g., What is democracy? What are the laws in Sweden? What rights do you have as a future citizen?). Paris elaborated the contradicting situation by saying that:

> We are powerless and bound to contingencies. Sometimes, we are being forced to limited resources, whereas at other times the government prioritize our work, and at other times, we have total creative freedom… The contradiction in it all is frustrating… because we are the ones that are interacting with the newcomers on daily basis, doing all the heavy work, but still, our voices are pushed to the periphery at times because we cannot control governmental decisions that affect the conditions of our work.

Another aspect of the wicked problem that was unveiled throughout the analysis, is the contradiction of contingent decision-making from higher authorities. Albert described this aspect as following:

> We have high competent people with a lot of experience, skills, and passion for what they do, yet they are dependent on unstable and uncertain changes that authorities decide for them. Implications of political decisions govern thus our work directly… sometimes for the worse because some decisions inhibit us from reaching our fullest potentials at work.

And when asking how well technology could help resolving the Contradiction of contingency, Albert answered that:

> I guess this is another thing that we cannot prepare for here and now… another contingency I guess.

Another integration worker however, the tutor Emma, had a different kind of answer when asked a similar question during the interview:

> I believe that technology can help us as long as we can be included in the de-
> cision-making process… I mean, we need to be involved in the process of de-
> cisions regarding the technology, what we want to use it for, how… you know,
> these kind of things… because it must match our strange working situation.

In summary, the phenomenological analysis unveiled the circumstances of which the second identified wicked problem (Contradiction of contingency) emerges, through a number of aspects: (a) higher authorities (e.g., government, policy makers) make unforeseen decisions that inhibit integration workers to use their fullest body of competency at work; (b) ambitions and decisions of higher authorities are not always well matched with available resources (e.g., lack of time, lack of manpower, lack of technologies); and (c) introducing new technology for integration work can either resolve, manage, or reinforce the contingencies, which in itself is considered as a contingency.

5.3   Contradiction of social presence

From the phenomenological analysis, an additional contradiction than the previously described one (Contradiction of contingency), was unveiled as a third wicked problem. The 'Contradiction of social presence' concerns the ways social presence is manifested in integration work and the implications integration workers experience. For instance, when integration workers teach civic orientation to newcomers, the newcomers must attend 15 sessions and be present during 60 hours in order to pass their class without any formal exams. Instead of exams, learning occurs and is evaluated on intersubjective grounds through social interaction in form of dialogues between tutors and newcomers. Being actively engaged in dialogues is thus considered as an important factor of learning civic orientation, whereas the outcome of learning experiences is not measured formally through any given means (e.g., exams, tests). The tutor Ken describes his lived experience with this situation by saying that:

> I can see from my own experience that newcomers interact with each other and
> learn from each other in the physical room. I encourage them to be active and
> social during the class, talk, and share their experiences about living in Sweden.

At the same time, there is a concern around how the implementation of new IT might reduce the feeling of social presence and create a cold distance between newcomers and tutors. The tutor Anna described her ideas regarding this aspect as following:

> Social presence and active interaction are key elements of learning. Technology has not been crucial for our role as tutors, instead we rely heavily on face to face interaction… learning new technologies and then using them might shift focus and create distance… I don't know for sure… but it is possible.

Connected to the aspect of proximity and distance, the interviews highlighted why a sense of being present and physically close to each other in a room, makes the newcomers feel more comfortable to interact with others that have similar understanding of the challenges and struggles with integration. At the same time, integration workers feel that there is a need for individual learning among newcomers. Hazim elaborated on this aspect by saying that:

> The newcomers want to learn about how society works, and they want to do this individually as well, regardless of space and time… they want to learn much more about society than we currently offer in our curriculum.

Another identified aspect of the contradictory meaning of presence, concerns the integration process, with a particular emphasis on how presence is manifested in civic orientation. For instance, during civic orientation classes, some newcomers are actively present (e.g., engaging in and dominating dialogues), whereas others are passively present (e.g., just listening) just because they need to be physically present for a total of 60 hours classes. Further, the presence of tutors is perceived as authoritative by some group of newcomers, whereas others experience the presence of tutors as nothing peculiar at all. The tutor Emma shared her lived experience of the situation as following:

> The newcomers want to learn about how society works, and they want to do this individually as well, regardless of space and time… they want to learn much more about society than we currently offer in our curriculum.

In summary, the phenomenological analysis unveiled the circumstances of the third identified wicked problem (Contradiction of social presence) through a number of aspects: (a) social presence is important in order to learn civic orientation, but the classes only require physical presence in order to pass; (b) social presence is reinforced through proximity between tutors and newcomers, whereas new technology may create a distance that reduces the experience of social presence among both parties; (c) social presence can be manifested differently in space and time, both physically and virtually, independent of an exact location. Consequently, the design of such technology would

have to be adaptable in order to incorporate social presence virtually, while at the same time preserving a sense of inclusion, nearness, and openness in the room that invites participants to engage.

5.4   Uncertainty of reliance

The fourth and final wicked problem (Uncertainty of reliance) was unveiled throughout the phenomenological analysis as a variety of uncertainties that the integration workers experience in their lifeworld. Due to the variety of their professional backgrounds, education, ethnicity, age, and current IT literacy, some of the integration workers feel confident in learning new technologies, whereas others do not want to become reliant to IT at their work at all. The tutor Ken elaborated on this aspect by saying that:

> Our situation as integration workers is unstable as it is due to the uncertain circumstances of integration policies. Bringing in new technologies can create more uncertainties, or potentially resolve some of the current ones… we don't want more pressure or more things to feel not so reliant to though.

Another aspect that was revealed by the integration workers concerned the general uncertainty that newcomers experience about their future. This kind of uncertainty goes beyond an uncertainty of being reliant to technology, and instead, concerns their overall life situation. The tutor Anna described this aspect as:

> Many of the newcomers struggle and are uncertain about their future in general… we integration workers are more uncertain about what bringing in new technologies will mean… but, I feel that the newcomers are reliant on our presence and experiences more than technology… they see us as their saviors.

The uncertainty of whom to be reliant to in society, has lead many newcomers to become unmotivated, uninspired, and devastated. Consequently, not having a social network, nor knowing which institutional sources to trust, has created an existential gap for many of the newcomers. The same tutor, Anna, shared her feelings about this aspect by saying that:

> It is devastating sometimes to see the look on some of the newcomers' faces… they look helpless and hopeless… many of them have children to support, but no jobs… many of them don't have a social network that is good for them… I

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mean, networks that helps them into the society… I feel like we need to help them with more directions in society.

Introducing new technologies that help reducing newcomers' existential gap, and also enable them to become better connected with online resources that support them on daily basis, would be desirable by many integration workers. However, as Paris explained, new technology must be able to support integration work without creating unnecessary reliance:

I believe that new technologies must be adaptable in order to benefit us without making us unnecessarily reliant; the IT must be able to support newcomers, tutors, and coordinators, in different ways.

Others, such as Albert the coordinator, believed that uncertainty of reliance can be reduced through learning activities that are transparent enough from the beginning of the design process to the point where the technology is fully implemented:

Involving us early on in the design process, and allowing our voices to be heard gradually, would enable us to learn what to expect in the future… none of us know the benefits of learning new technologies until have actually tested anything.

In summary, the phenomenological analysis unveiled the circumstances of the fourth and final identified wicked problem, through a number of aspects: (a) integration workers feel uncertain about becoming reliant on new technologies, because there are already other uncertain aspects of their work that causes them pressure at work; (b) other aspects of uncertainties concern the newcomers state of despair and uncertainty of the future, and what resources in society they need to be reliant on in order to succeed; (c) reducing the uncertainty of what potentials new technology has for integration work, was expressed as a desirable aspect of including integration workers in the design process; (d) other integration workers believe that their uncertainties of becoming reliant to new technologies without knowing the benefits of it, is a naive state of mind, which will reduce continuously as new IT becomes transparent and intuitively used at work.

6   Discussion

The objectives of this study were to understand the wickedness of the design situation and propose sufficient design implications for the design process in order to manage the wicked problems through design of supportive IT for integration work. The phenomenological account helped unveiling the circumstances of the wicked situation, and identifying four wicked problems that constitute the wickedness of the situation. In this section, learning outcomes from unveiling the wicked situation is briefly discussed. Then, implications for the design process are rendered and discussed systematically. Finally, implications for research, along with the phenomenological account of this study, are discussed.

6.1   Learning outcomes from unveiling the wicked situation

First, the identified wicked problems are interrelated and not mutually exclusive. For example, the wicked problems 'Uncertainty of reliance' and 'Contradiction of contingency' are interrelated because contingency causes a need and an uncertainty to be reliant on others—e.g.,if the integration workers had not been reliant on policy makers' or governmental authorities' overarching decisions, the working conditions of the integration workers would have been less contingent. On the other hand, it is equally plausible that if there had not been a Contradiction of contingency, there would not be an uncertainty of reliance—e.g.,if the integration workers had total freedom in how they want to design and perform civic orientation for newcomers, they could also manage their workload differently without being heavily reliant on unforeseen decisions from authorities. Hence, as with any wicked problem, the identified wicked problems of this study are also difficult to pin-point separately, because they are untestable and unique to the situation of which they are situated in (Rittel & Webber 1973).

Second, the wicked situation that the four identified wicked problems constitute, share unstable circumstances that were unveiled via the lifeworld of integration workers. Reconstructing their lived experience of the wicked situation became thus an essential asset for unveiling the circumstances of the wicked situation—e.g.,the analysis of their lived experience uncovered the characteristics of their experiences from a number of aspects, including: struggles, contradictions, uncertainties, contradictions, distance, proximity, pressure, reliance, independence, and more. This discovery is an important one for overcoming a subject/object relation (Introna & Whittaker 2003) with the design situation because wicked problems origin from the nature of the design subject (e.g., wicked problems are wicked because design implies discovery) (Buchanan 1992;

Gregor & Hevner 2013), rather than the immediate quality of the lived experience of the situation (Andrade et al. 2017; Bakhtin 1993).

Third, from a phenomenological perspective on design (e.g., Ehn 1988; Mwadulo & Odoyo 2020; Riemer & Johnston 2014), design activities take the wicked situation that integration workers encounter at work, as the fundamental starting point for the design process. Here, the reconstruction of integration workers' lived experience can only unveil the circumstances of the lived experiences in order to enframe the design process reflectively. Enframing in such that design implications do not steer the design process to answer a particular question or providing a single solution (Arnold 2003). But rather, the design process is enframed (has the intention of, has a particular sense of) continuing to unveil the wicked situation over time, as it is meaningfully recognizable and experientially accessible (van Manen 2016) to participants of the situation (e.g., researchers, integration workers). Hence, a collective effort of co-creation among researchers, designers, and integration workers, is advocated in order to make/take perspectives (Boland & Tenkasi 1995) that are meaningful for the design activities.

6.2   Design implications for the design process

In light of the three presented learning outcomes, as well as the identified wicked problems of this study, two layers of design are addressed in this research: (1) designing supportive IT for the civic orientation program, which is a special case and instance of integration work, including the processes involved and the emergent tensions of supporting the integration of newcomers in a society; (2) lessons learned in form of design implications that inform other designers who deal with similar wicked situations. The design implications do also express this research's attempt to show the necessity to design supportive IT for integration workers on top of the civic orientation program. Hence, the design implications imply an element of generalizability that casts the identified wicked problems of this study into a class of problems (Hevner et al. 2004) when designing supportive IT for integration work. Consequently, the civic orientation program is treated as an instance of the class of problems because it reports a special case of where integration work is supported through IT. In light of this rationale, four design implications are proposed and depicted in Table 5, and each proposed implication informs the design process and targets a wicked problem.

Design implica-tion	Description	Wicked problem
IT for subtle decision makings	Design IT that tackles the unforeseen shifts of decision making by supporting a mindful approach that unfolds the interrelations between different contexts of integration work	Struggles of hopes and fears
IT for cross-boundary interaction	Design IT that enables collaboration among a heterogeneous group of users (e.g., integration workers) and allows them to cross professional boundaries through a perspective-making and a perspective-taking of their lived experiences with integration work	Contradiction of contingency
IT for disclosing proximity and distance	Design IT that discloses the implications of proximity and distance through social interaction and presence in physical and virtual spaces of integration work	Contradiction of social presence
IT for increased empowerment	Design IT that increases the users' (e.g., integration workers) sense of empowerment (sense of control and autonomy) over emerging uncertainties and unforeseen situations of integration work	Uncertainty of reliance

Table 5. Overview of Design Implications

The first design implication (IT for subtle decision makings) targets the wicked problem 'Struggles of hopes and fears' by stressing the need of designing IT that supports subtle decision-makings: e.g., decisions that affect the lifeworld of integration workers and their capacity to deal with uncertain situations at work. On the one hand, integration workers need to be able to adapt to uncertain situations that emerge due to the decision makings of other instances (e.g., authorities, policy makers, county politicians), whereas on the other hand, the integration workers need to make unique decisions that affect their work as well as the lives of newcomers. Enframing the design process accordingly, would require that the design process is informed by necessary parties that have power over the discourse of integration work, their roles in decision making, and how IT can help them to unfold the interrelationships between different contexts of their decision-making process. For instance, online IT-platforms that support integration (e.g., Schreieck et al. 2017), stress the design of flexible features for communication and boundary crossing among communities of practice that possess different culture,

competency, and individuals with different levels of experience (novice, experts). Subsequently, flexibility in communication is emphasized because it mediates interrelations between individuals to become unfolded and accessible for meaningful perspective making/taking (Boland & Tenkasi 1995), which is built upon mindful negotiation and trust—e.g.,mindful in the sense that communication is prioritized across different communities (e.g., integration workers, policy makers, county administrative) before actual decisions are taken.

The second design implication (IT for cross-boundary interaction) targets the wicked problem 'Contradiction of contingency' by stressing the need of designing IT that helps the integration workers to capture and share their lived experiences through intersubjective forms of collaboration. Intersubjectivity refers to the phenomenology of shared meanings that are constructed by people in their interactions with each other, and used as everyday resource to interpret the meaning of social elements of their lifeworld (Spiegelberg 2012; Zahavi 2018). Collaboration, being the strong motivator of facilitating social interaction (Lyotard 1991), is stressed to be supported through means that afford the integration workers to cross boundaries between their own and other integration workers' area of responsibilities. Enframing the design process accordingly, would acquire to design features such as: scalable functionality for producing, maintaining, updating, and sharing multimodal content (e.g., text, images, video, sound) for civic orientation (Vesterlind 2016); pedagogical work-integrated e-learning spaces (e.g., hubs, video tutorials, forums) (Östlund 2017) that enable integration workers to capture and share their pedagogical ideas and skills with each other (tutors, coordinators, content producers); and/or a reflective relation to IT that reinforces a process of enactment (Leonardi 2012; Orlikowski & Iacono 2001) which supports a sense-making of integration workers' profession through use of technology (e.g., what is the meaning of their professional roles, what bearing does technology have for their profession and integration in general).

The third design implication (IT for disclosing proximity and distance) targets the wicked problem 'Contradiction of social presence' by stressing the need of designing IT that helps disclosing the implications of proximity and distance for integration work, because proximity and distance influences how integration work is governed—e.g.,teaching in a physical setting versus a virtual space. How social presence is manifested, in what contexts, and how it affects the interactions between various parties (integration workers, newcomers, policy makers), are all important aspects of how integration workers experience the implications of proximity and distance in their work. The supportive IT need thus to take different modes of social presence into account, in order to disclose the implications of proximity and distance for integration work (Vest-

erlind 2016). Enframing the design process as such, would thus concern the different manifestations of social presence in proximity and distance, including: social presence in a virtual e-learning space (Shea et al. 2012; 2014) where tutors interact with newcomers and teach them civic orientation; social presence in physical workplace settings (e.g., office spaces, classrooms) that affect the integration of theoretical knowledge with practical experiences (Tynjälää & Häkkinen 2014); and/or social presence in blended spaces (e.g., physical, virtual) (Lowenthal 2009; Orcutt & Dringus 2017) that frame the affordances and constraints of social interaction between tutors and newcomers.

The fourth and final design implication (IT for increased empowerment) targets the wicked problem 'Uncertainty of reliance' by stressing the need of designing IT that empowers the integration workers means to guide the newcomers, in how they can become connected with society and detached from unnecessary worry and fear. Enframing the design process accordingly would acquire to design features that integration workers can use to highlight and unveil social institutions, authorities, or other services that help newcomers on daily basis to become more connected and settled with their host society (Bustamente et al. 2018). Moreover, because integration workers are bound to the duty of following decisions that are made from above, such as politicians, policy makers, and other social institutions, new technologies can increase their sense of empowerment through new opportunities and means that allows them to navigate newcomers into the society. Examples of such technologies vary and include: mobile services that integration workers can provide newcomers with to navigate and learn about their environment (Baranoff et al. 2015); online tools that integration workers and newcomers can use to communicate, in order to jointly formulate needs and goals; and/or platforms that help integration workers to guide newcomers and help them mobilizing their social networks (Gifford & Wilding 2013).

6.3   Implications for research

The addressed wickedness in this study has implications for designing IT that supports integration work through a variety of explicated aspects that target the identified wicked problems. Consequently, the design implications enframe the intentionality (direction) of the design process with the ambition of including the integration workers as co-designers. Doing so, the design process incorporates the phenomenological ontology of design (explained by Ehn 1988; Riemer & Johnston 2014; 2017) and adopt design research philosophy that advocates co-design as a means of bridging the subject/object dualism (Nelson & Stolterman 2003). Hence, this study provides and demonstrates a clear case where a phenomenological account is useful for design-oriented research in

IS, and accumulates on prior research in IS that advocate phenomenology as a prominent way of doing IS research (Boland 1985; Ehn 1988; Introna & Whittaker 2003).

Moreover, the findings of this study can be useful beyond this study, particularly because designing IT for integration work is considered as an instance of a larger class of problems, namely designing IT that solve grand challenges of society (Gregor & Hevner 2013). Literature has suggested that there can be different levels of wickedness (Burge & McCall 2015; Farrell & Hooker 2013), where integration is considered to be an important grand challenge and wicked problem (Majchrzak et al. 2016). The range of complexity of the design situation that was elucidated and described in this study, suggests that design of IT for integration work has a high level of wickedness, because the situation comprises many complex variables and ill-natured circumstances. Hence, the findings of this study can be considered as a direct contribution to how wicked problems can be identified and unpacked through IS research.

As a final reflection, the phenomenological account used in this study was both helpful and led to important insights that have expanded the understanding of the wickedness of designing IT for integration work. The demonstrated phenomenological account can be useful beyond this study because it provides considerations on how phenomenology can be adopted and employed, both methodologically as well as theoretically (e.g., employing concepts that inform the terminology and way of thinking). Furthermore, phenomenology was found particularly supportive of the explorative nature of this study, as well as being helpful to frame and understand the wickedness of the design situation through data collection and interpretative form of analysis (Eatough & Smith 2017)—e.g.,helpful for the explorative mode because phenomenology has the clear objective of unveiling hidden phenomena (van Manen 2016), and helpful for data analysis because phenomenology offers a rich set of interpretative guidelines for how to unveil hidden phenomena (Eatough & Smith 2017). Hence, phenomenology would therefore seem particularly suitable to adopt and employ in design-related situations where uncertainty is high due to folded circumstance, and where situational understanding is of crucial nature in order to unveil the circumstances that causes the uncertainties.

7   Conclusion

This paper intended to answer the question: how can the wickedness of designing IT for integration work be understood, and what are the implications for the design process? Based on a phenomenological analysis of interviews, the wickedness is described as consisting of four interrelated wicked problems: 'Struggle of hopes and fears', 'Con-

tradiction of contingency', 'Contradiction of social presence', and 'Uncertainty of reliance'. These problems are not mutually exclusive, but together, they make up the wickedness of the design situation. Subsequently, the four identified wicked problems have implications for the design process with the involvement of integration workers as co-designers in the design process. For this study, a total of four design implications were proposed and elaborated: 'IT for Mindful Decision Making, 'IT for Intersubjective Collaboration', 'IT for disclosing proximity and distance', and 'IT for Detached Connectedness'. The implications target the identified wicked problems and enframes the design process accordingly to the meaningfulness of using IT for integration work.

In addition to the description of wickedness of the design situation, this paper also contributes with a viable way of studying complex, uncertain, and ill-natured design situations of this kind; the phenomenological account that this study employed was valuable for exploring, unveiling, understanding, as well as explicating the wickedness of the design situation. Phenomenology would thus seem suitable for design-oriented IS research that cope with wicked design situations. Additionally, demonstrating how phenomenology can be adopted and employed to explore and unveil a wicked design situation is also considered as a contribution, because future IS researchers can look at this study and draw inspirations upon (not imitating nor replicating) how to design and perform research activities that employ a phenomenological account, especially when dealing with complex design situations in design-oriented IS research.

Finally, the main limitation of this study is that wicked design situations are very specific in their nature, meaning that this research only focused on one single case alone concerning integration work. In order to generalizable the proposed design implications into principles or a theory, more research is needed on how other settings that cope with integration work suffer from wicked problems, and how outcomes from this research can support them in tackling a wicked design situation. Hence, it would be feasible to operationalize and evaluate the proposed design implications of this study through future design-oriented IS research that deals with wicked design situations.

Acknowledgment

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