Digital co-creation: Mission (im)possible?

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Mission (im)possible?

Hanna Kirjavainen and Harri Jalonen

Introduction

Co-creation of public services assumes collaboration between a range of parties. That is particularly evident in the involvement of users in the implementation of services, involvement that spans the ideation and design to the implementation and evaluation stages of such services. Ideally, the service end user has a say in the content, quality, and availability of the service under development. Co-creation is commonly seen as a response to the needs of service users (the quality argument), citizen engagement (the democracy argument), resource efficiency (the productivity argument), production of new and creative ideas (the innovation argument), and the general acceptability of services (the legitimacy argument; see, e.g., Brandsen & Honingh 2018). While well-intentioned, the extant research offers relatively little evidence of co-creation being a notable success (e.g., Voorberg et al. 2015). Some research even indicates co-creation can have negative consequences, including the deliberative rejection of responsibility, reduced accountability, rising transaction costs, weakening of democracy, reinforced inequalities, implicit demands, and value co-destruction (e.g., Wu 2017; Steen et al. 2018). The picture becomes gloomier when clients who are expected to contribute to co-creating services lack the ability or the willingness to do so. Extant research identifies several issues: participation may be organized in a way unfamiliar to key parties; there might be difficulties integrating personal experiences and professional knowledge; stakeholders' lived experiences might reflect that little has come of the input provided by vulnerable citizens (Bonevski et al. 2014; Brandsen 2021).

One problem is providing only traditional forms of co-creation methods to citizens that emphasize the ability to form and voice opinions and preferences (Brandsen 2021). Those forms disadvantage people with mental or physical disabilities and those with social problems. Moreover, the different groups framed as *vulnerable* are not as internally homogeneous as is usually portrayed in public discussion, something particularly evident in any discussion on young people who are not in education, employment, or training (NEET). That category of young people (here referred to as NEET youths) includes myriad sub-groups, such as drug users, those with different aspects of mental illness, first- or second-generation migrants, and the socially withdrawn. Naturally, these rough categorizations overlap and intertwine at different points and could be divided into smaller, more

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accurate sub-groups. These issues of categorization and inclusion are the starting point of this chapter, advancing Brandsen's (2021) idea of more individual co-creation approaches that are tailor-made to match the target groups.

The rapid penetration of digital technologies has ushered in new opportunities for co-creation But unfortunately, the promise has not been fully realized (e.g., Lember et al. 2019) and the question of the directions in which digitalization will direct co-creation remains open (Lember 2018). This chapter provides some examples of how digital opportunities may be exploited in co-creational settings, deriving examples from an international research project targeting NEET youths, who are usually capable of and interested in using digital means, such as smartphones and social media. Many vulnerable youths are impossible to reach through traditional means, and some, such as the socially withdrawn, can be extremely difficult to find, let alone connect with. Our individual-based approach also addresses the common criticism that digital means are not equally useful for those who are digitally incapable (Clark et al. 2013), as one size is not even meant to fit all.

This chapter discusses the pros and cons of digital technologies in general and specifically from the perspective of vulnerable groups. The chapter begins with a brief introduction to vulnerability. Then having reviewed the literature, the chapter presents the promise and pitfalls of open data, social media, and artificial intelligence (AI). The chapter also showcases some digital initiatives conducted in the research project. The chapter ends with a discussion and conclusion section that calls for conceptual understanding and presents some managerial implications.

Many faces of vulnerability

It is not easy to comprehensively define the concept of vulnerability, as the meanings attributed to it depend on the disciplinary approach adopted. This chapter leans on the sociological perspective, linking vulnerability to social exclusion, admittedly a broad term too. Brandsen (2021) explains social exclusion by reference to a lack of resources and opportunities that people generally possess. It is important to remember that vulnerability as a concept is normative and deficit-based, implying some kind of situation or behaviour that is problematic for society (Brown 2011). The term may exacerbate exclusion and reinforce stigmatization. The reasons for people being in vulnerable positions should not be seen as mainly intrinsic because issues such as globalization, natural disasters, shocks to the world economy, and existing societal structures are responsible for a significant proportion of citizen vulnerability globally (Brown 2011; Brandsen 2021).

Vulnerable populations often either use public services excessively or shy away from them. Both cases would encapsulate many dissimilar groups with little in common but the mismatch between existing services and the needs of individuals. However, most public services do at least target vulnerable groups, so including them is not only about making the services more efficient but also more legitimate too in the eyes of the users (Verschuere et al. 2018). Governments have tried different approaches with citizens, but well-off people tend to participate more eagerly than the marginalized. Consequently, even governments have been

known to filter potential participants when selecting people for co-creation activities (van Eijk & Steen 2014; Steen 2021). It is particularly challenging to engage with groups who are outside the service system, as the motivation to engage is heavily linked with whether how people assess the applicability of the service (Steen 2021).

The reasons behind the underrepresentation of vulnerable and disadvantaged populations vary, including their difficult conditions or circumstances such as health problems or economic situation (Corus & Saatcioglu 2015), lack of skills (Van Eijk & Steen 2014), or poor perception of their own competence to engage, or mistrust of government or fellow citizens (Steen 2021). Mulvale et al. (2019) summarize the most common problems as issues with initial recruitment, repeated engagement, and power differentials, as well as challenges with ethical considerations, context, and communication. The quality of relationships is crucial, and the need for professionals to exhibit flexibility, responsiveness, and a deep understanding is fundamental. In the worst-case scenario, any reckless engagement with power-related issues and relations in co-creation could nudge the process to producing harmful results (Osborne et al. 2016). Nevertheless, exclusion probably leads to the preservation of existing structures, ongoing inequity, and the continuance of a mismatch between available services and needs (de Freitas & Martin 2015).

The current imbalanced involvement produces a constant bias. The core of this problem probably lies with the methods traditionally used to garner involvement, which might be effective but are by no means inclusive (Brandsen 2021). Brandsen (2021, 530–532) differentiates five main factors contributing to the limited involvement of vulnerable groups in the participation process, with those being excessive time demands, intimidating formats, mismatched expectations, fundamentally different perspectives, and perceived absence of added value. Taking part is also usually based on verbal communication, favouring those who are able to voice their opinions and are used to doing so. In addition, professionals may not appreciate personal experience, perhaps being more used to relying on research-based knowledge. Citizens also often expect more influence than is afforded them and then feel disappointed when their contribution does not lead to significant change. Many of these reasons discourage participation in general: however, the lack of social skills and self-confidence common in vulnerable groups causes an overlap, which magnifies the destructive effects because people's experiences are multidimensional and intersectional (Tsatsou 2020). Co-creation often relies on models from the private sector (Brandsen & Honingh 2018), but the pace and intensity common to commercial environments might be overwhelming for people in vulnerable positions, as they would usually have less agency and fewer capabilities than others (Fox et al. 2020). Moreover, the public sector differs from the private sector in its users being unwilling or coerced customers and in usually aiming for its service users to become more or totally self-reliant, to the point that they are no longer customers (Fox et al. 2020).

Accordingly, public-sector initiatives to implement co-creation demand completely new methods. Determining those methods requires redefining the purpose of the services to be constructed and expectations of what service users will bring

to the process (Fox et al. 2020). Too often, public services concentrate on fixing single issues (usually the most pressing one) instead of viewing service users holistically. Another common defect is concentrating on problems rather than strengths. The current approach tends to be to fit the person to the service and not the other way around (Wilson et al. 2018). True co-creation, in contrast, would be based on intrinsically utilizing the asset-based and bottom-up approach (Fox et al. 2020). Besides this, successful co-creation requires both formal and informal ways of ensuring the division of power, giving precedence to the voices of vulnerable groups, and also for the process to embody reflectivity, accountability, and transparency (Mulvale et al. 2019).

Digital technologies: Open data, social media, and AI

The literature indicates advances in digital technology are enabling factors helping bridge the gap between service providers and service users. It seems that proponents of the open data movement are re-articulating notions of democracy and participation (Jalonen & Helo 2020) and presage innovation, but only if private and public databases are made available to application developers. Similarly, social media encourages citizens to share their knowledge and expertise, which would enhance collaboration and innovation. Open data and social media resonate with the idea of open innovation (Chesbrough 2006) and democratizing innovation (von Hippel 2005), which both emphasize how interactions between different stakeholders are productive sources of innovation. AI, in turn, promises to support the delivery of efficient, responsive, and effective services based on the use of data (e.g., Berryhill et al. 2019).

Open Data promises benefits but also presents several barriers

Open data refers to information that anyone can access, use, and share. Open data can be used when it is made available in a common, machine-readable format. Typically, open data is licensed, permitting people to use those data however they wish, including transforming, combining, and sharing it with others, even commercially (European Data Portal 2021). Open data initiatives are expected to bring many societal, economic, and operational benefits. In the public sector, open data can be used internally (e.g., improving processes) or externally (e.g., creating new services; Mergel et al. 2018).

The literature reports four particular key promises: innovation, efficiency, democracy, and transparency (e.g., Janssen et al. 2012; Safarov et al. 2017; Zuiderwijk et al. 2019). First, open data helps to instigate new services and discover new solutions to address societal challenges, such as economic growth, environmental sustainability, and social resilience. Second, open data improves the efficiency of operations related to information processing and reduces the costs of searching for, producing, and sharing data. Offering the ability to access data over the internet reduces transaction costs, administrative burden, and the need to reproduce data (Jetzek et al. 2013). Third, open data fosters citizen participation and engagement in political and democratic processes by providing motivation and

lowering the threshold for participation. Easily accessible and usable data may engage and empower citizens. Fourth, open data increases governmental transparency in terms of how much information government shares with its citizens. Transparency requires honesty and openness and also improves accountability. Open data plays a key role in promoting transparency, as it can facilitate exposing government processes (e.g., bidding, contracting, and purchasing documentation; agendas, minutes, and final protocols; statistics and customer feedback) to public scrutiny. Greater transparency leads to more effective public control over the data underpinning policymaking (Lember et al. 2019).

Open data brings not only opportunities but also some major challenges. Sieber and Johnson (2015), for example, positioned open data at a crossroads. That research highlights significant concerns regarding the fragile nature of open data within the government space and the need to negotiate the ethical-economic tension between governments as open data providers and the citizenry and the private sector as users of open data. Janssen et al. (2012) warn of the myth of open data: While there appears to be broad policy and academic research support for the open data approach, Janssen et al. conclude that there is not enough evidence on how open data policies are put into practice. Jamieson et al. (2019) take a step further by claiming that it is impossible to have a more transparent and efficient public service, to have a more informed citizenry, or to promote innovation through open data. They argue that open data can contribute to neither political and social nor operational and economic benefits. In addition to policy-level challenges, there are several technical issues to be addressed. Beno et al. (2017) studied obstacles to using and publishing open data in various types of agencies including academia, government, the public sector, private sector, and non-governmental organizations (NGOs). The study reports that the barriers related to data users can complicate or inhibit the consumption and reuse of published open datasets. The barriers related to the data providers can lead to them declining to publish open data. There are also barriers relevant to both providers and users in the form of a lack of knowledge or experience. The study also implies that the severity of obstacles varies internationally and between agency types.

High expectations are associated with open government data yet promises to increase transparency, participation, collaboration, and co-creation remain largely unfulfilled (Jamieson et al. 2019; Lember et al. 2019). Access to open data per se does not engage citizens and other stakeholders in co-creating services, nor does it spur innovation.

Social media enables interaction but can lead to disconnection

Social media is a constellation of shared technologies that derive value from allowing the creation and exchange of user-generated content. The early days of social media saw it depicted as an innocent arena for sharing information and interacting socially. The assumption was that social media would empower citizens and customers to express their activity in unforeseen ways; however, as social media matured and became ubiquitous, its value as an empowering technology came to be questioned.

Social media has transformed our communication habits in many ways. It has provided us with an open environment in which to connect and publish all kinds of content. The absence of gatekeepers empowers people to express their voices, meaning social media has not only facilitated exploring new ideas but also offered a context for collaboration between government and citizens in a way that increases government responsiveness (Bertot et al. 2012; Loukis et al. 2017; Eom et al. 2018). In addition, studies show that social media improves innovation processes in public-sector organizations (e.g., Mergel 2016). Social media can also be a useful context for co-creation, and Driss et al. (2019) suggest that social media's capacity to enable citizens to create, share, and comment on issues in an uncontrollable way could accelerate citizens becoming policymakers. Similarly, Jalonen et al. (2021) found that social media can enrich the knowledge base relating to the initiation phase of the co-creation of public services. The last study advises that social media discussion dealing with the availability, access, and quality of public services – even if acrimonious – can be testimonials that enable a public organization to identify bottlenecks in the service delivery process.

Social media has not only increased the amount of shared information, such as opinions and facts, but has also inspired people to share their feelings about topics encompassing products and services and societal issues. In the early days of social media, there was an optimistic view that it could strengthen the societal consensus through discussions hosted on its platforms. While that is still possible, there is now a greater awareness that social media can also be used for malicious purposes. Commentators have raised concerns over issues including social polarization, the speedy diffusion of misinformation and disinformation, breaches of privacy, and data surveillance (e.g., Zuboff 2019). Instead of fostering open discussions, social media has sometimes created echo chambers of like-minded people that inhibit understanding different perspectives. Deliberately promulgating disinformation has been used to damage the reputations of organizations and individuals and to influence public opinion and the democratic process (McKay & Tenove 2021). Simply put, what was anticipated would be a remedy has become a disease.

The paradox of social media is tangible (e.g., Jalonen 2014). Social media sites allow citizens to fulfil many of the tasks online that are important to them offline: staying connected with friends and family, making new friends, creating, and expressing identities, sharing and exchanging ideas, and offering and receiving emotional and informational support. Nevertheless, social media carries new risks, such as peer-to-peer bad behaviour; inappropriate and insulting content; lack of self-confidence, self-respect, and self-esteem; and data and privacy leakages.

AI is stupid without ethical consideration

The use of AI in the public sector involves the transfer of personal data between users of public services, an AI network, and public authorities. A number of governments in the Organisation for Economic Co-operation and Development (OECD) have developed AI-focused strategies, and others are in the process of doing so. Systems utilizing AI computer systems are expected to offer cost savings,

more responsive, and better integrated and coordinated services for businesses and citizens (Berryhill et al. 2019). An AI system is an appropriate technology wherever there are large and coherent datasets. One of the most promising areas is healthcare, where AI can identify disease symptoms at an early stage (Noorbakhsh-Sabet et al. 2019). Utilizing AI has helped diagnose cancers, predict vulnerability to cardiac arrest, and detect Alzheimer's. A strong AI system can thus prevent misdiagnosis and improve opportunities available to public authorities and health professionals to tackle issues and adjust the services offered. The more time information service providers have, and the more accurate that information, the more they will be able to create efficient and effective services. An AI-oriented system can also improve the efficiency of administrative tasks and customer service. Advances in speech-recognition technology enable the deployment of automated online assistants and chatbots in multiple domains, from childcare and education to services for the elderly to respond to simple information requests. In addition to the various efficiency gains available (Wirtz & Müller 2019), AI provides opportunities to improve public services, for example, sentiment analysis (Liu 2012) allows municipalities to explore service-related sentiments and emotions in social media content. Sentiment analysis enables the analysis of unstructured, human-generated texts, which can help public organizations understand their operational environment and improve their detection of the symptoms of collective emotions and attitudes in a way that should flow through to enhance service-user experiences.

Similarly, AI can help detect anomalies, regularities, and trends in service usage, thus revealing niche needs to public organization planners. Service design can also benefit from AI, which can illuminate where services could be more user-focused and better tailored to changing circumstances. A public organization that has a strong understanding of the topics discussed and shared on social media will be more prepared to address threats and exploit opportunities. An example would be a public organization harvesting data on anti-vaccination campaigns from social media to prepare strategies and tactics to equip its public health staff to address the arguments.

Despite the many possible benefits, there is a lack of ethical principles and standards regarding AI applications, giving rise to concerns about accountability and the transparency of AI systems (Scherer 2016; Casares 2018; Wirtz & Müller 2019). Machines outperform humans in many planning and controlling tasks. The legitimation of their position rests more on their success in making responsible and ethical judgments, engaging clients, and employees, and identifying and executing new opportunities. The main ingredient of AI-assisted governance is personal data that public authorities and AI-mediated actors collect before or during the service delivery process. This poses a risk related to the privacy of the public's data, exclusion from social and economic opportunities, due process, the quality of algorithmic decision-making, distributive justice, and the overall regulation and governance of AI (Yeung 2018). Governing and regulating AI is particularly relevant for the public sector, which holds large datasets that help make decisions on behalf of a large number of people. Various possible regulatory problems are apparent in the context of AI (Scherer 2016: 359): the discreetness problem (AI applications may be developed outside of an integrated institutional environment), the diffuseness

problem (AI may be developed by diffuse actors operating in different locations and jurisdictions), the discreteness problem (AI can use different sets of technologies, making it challenging to assess the potential of each before they are combined in one systemic framework), the opacity problem (AI technologies can be opaque and unintelligible to potential regulators), the foreseeability problem (AI can be autonomous and work in ways that may be hard for its developers to foresee), the narrow control problem (AI may be beyond the control of responsible actors), and the general control problem (AI could be beyond the control of any human agent). These problems give rise to ethical dilemmas concerning the type, form, and extent of public decision-making to which AI technologies should be applied.

AI will not replace human work in public services in the near future. However, it may benefit strategies emphasizing the effectiveness and quality of public services, for example, through its ability to detect conformity and anomaly in service usage. An AI system is able to process huge amounts of data, identify patterns, and therefore guide public organizations to make data-driven decisions. With new technologies also come new threats. In the case of AI, the most fundamental threat arises from machine-made judgments on ethical issues or situations where AI imposes externalities on other stakeholders.

Digital co-creation with vulnerable groups

The digital divide is a worldwide issue today and one that encompasses access to the internet and the skills required to use it effectively, how it is used, and the outcomes of that use (Scheerder et al. 2017). How people utilize the internet and with what consequences has grown more salient as in the developed world, almost everyone has access to the internet: in the European Union, over 90 per cent of households in 2019 had internet access (Eurostat 2021). However, thus far, research has focused more on internet use and to some extent internet-oriented skills, instead of the so-called third-level digital divide concerning the benefits of internet use (Scheerder et al. 2017). Age, educational level, and employment status account for a large proportion of the differences in internet-oriented skills and the use of the internet (Blank & Groselj 2014), whereas differences in outcomes seem to relate to other digital divide determinants, such as being unemployed and having a lower education level. People in the last two groups seem to scarcely engage in the social and political dimension, which leads to sub-optimal outcomes. Overall, the benefits of internet use correlate with education levels and income – that is, people with higher education and levels of income utilize the internet more profitably than those with a more basic level of education and lower income. That profitable usage might include accessing online courses, employment, e-health services, and social and political participation, whereas those with weaker resources spend more time engaged in unproductive surfing (van Deursen & van Dijk 2014; van Deursen & van Dijk 2015; van Deursen et al. 2017). This pattern of behaviour might be explained less by skills and more by personal resources, such as interest and socialization patterns (van Deursen et al. 2017) leading to digital exclusion. The situation is a consequence of the complex

reality of people's access and use of technology and their capability and willingness to utilize different forms of technology (Borg et al. 2019).

Nevertheless, ongoing digital development has benefited vulnerable people in many ways, such as helping them save time and money, offering them flexible options in both spatial and temporal terms, enhancing independence and supporting networking and participation, and instilling confidence to communicate owing to the anonymity of online interactions. However, some vulnerable groups may not be fully capable of utilizing digital means, and some may be exposed to abuse via social media (Tsatsou 2020). Social media can both mitigate loneliness (Kivijärvi et al. 2019) and cause or increase psychological problems (Keles et al. 2020) or even reinforce participants' status as social outcasts (Vainikka 2020).

The internet has also provided a new context for professionals to support those in need. The internet-mediated means available include online counselling (Richards & Viganó 2013), healthcare services (Halford et al. 2009), and social work (Chan & Holosko 2016). Brandsen (2021) states that digitalization reduces the reliance on physical meetings, thus enabling people to participate from their homes. That facility might significantly lower the threshold to join in for elderly people, people from rural areas, the socially withdrawn, and other groups with disabilities or social problems, such as debilitating insecurity. Digitalization also facilitates adopting a visuals-based approach, which can help those unable or unused to reading long texts or participating in voice-based mediation. Participatory access can be further enhanced through simple smartphone apps (Clark et al. 2013), available irrespective of location and perhaps not even constrained by time of day (Lember 2018). The counterpoint to the advantage conferred by online anonymity mentioned earlier (primarily encouraging participation) is that those citizens who join in may be unknown (Lember 2018).

Lember (2018) emphasizes that digital technologies never have a neutral impact on society, and the codes behind digital solutions always include values and norms. The digital progression may lead to greater pressure to censor content and manipulate algorithms, leaving vulnerable groups in an even weaker position than currently (Brandsen 2021). Van Deursen et al. (2017) fear that digitalization threatens to create a vicious cycle where vulnerable groups are marginalized by technology, as increases in digital skills do not mean internet usage leading to beneficial outcomes for everyone, as the correlation depends heavily on sociocultural, socioeconomic, and personal factors. These drawbacks take time to become visible (Lember 2018), which makes them more difficult to point out. The crucial question is who controls the form of digital technologies in public service delivery (Lember et al. 2019).

The debate about whether participation in the offline and online world follow similar patterns and whether the internet amplifies, or even accelerates, inequality remains open. Borg et al. (2019) summarize that social support, education via collaborative learning or experience, and inclusive design are required to enable digital inclusion. As the evidence points to those with higher levels of education and good incomes currently being more likely to benefit from institutional outcomes (van Deursen & van Dijk 2014), it is important to discover new digital approaches, particularly those aiming to engage vulnerable people.

Deploying digital technology in practice

Co-creating Service Innovation in Europe (CoSIE) was a research project conducted from 2017 to 2021 and funded under the Horizon 2020 programme of the European Commission. The project aimed to engage citizens, especially groups often labelled "hard to reach", in the collaborative design of public services. During the implementation of the project, the collaborative partners developed diverse methods of co-creation in the field of public services. Of particular interest was the utilization of digital technologies to facilitate the co-creation aspect of the service design (CoSIE 2021).

Here we report insights from the pilot conducted in Finland. The Finnish pilot "Youth Co-empowerment" focused on NEET youths. The rationale behind the pilot was to harvest more data about the situation of NEET youths to understand the many shades of marginalization and to pilot new ways to involve them in society. The project extended the project team's understanding of the multifaceted nature of the target group, and it was clear that several approaches had to be piloted to engage NEET youth and ensure their voices were heard (see Brandsen 2021). Furthermore, it became apparent that many youths are willing and able to participate in shaping new digital public services that suit them (see Lember et al. 2019). The ideas garnered from the youths involved used elements familiar and interesting to their generation, such as social media, videos, AI, and gamification. With those two viewpoints as a premise, several digital initiatives were introduced in the Finnish pilot.

The Finnish municipalities follow their key performance indicators regarding the health and well-being of their citizens. The Finnish Institute for Health and Welfare maintains several open databases, which provide information about general well-being from different perspectives. These databases illustrate the overall situation; however, their data is in one way or another converted. The data only provide average findings from the municipality or age group. Therefore, they must be connected to user-level data if they are to contribute to making services more user-centric and impactful. Currently, however, the necessary data do not exist as an official open data source. To that end, the Finnish CoSIE pilot team connected open data harvested from social media and other sources. The team developed several prototypes of digital applications such as those they labelled "*Here I am*", "*Tukemon Go*", and "*Luuppi*". In addition, the team made use of AI. *Here I am* and *Tukemon Go* were ideated in social hackathons, in which youths in vulnerable positions and professionals worked side by side in small teams, developing new ideas to tackle youth marginalization in Finland. In line with Lember (2018), social hackathons represented both a method of co-creation and a source of co-creation initiatives.

Here I am is an application that seeks to find and activate young people: especially those at risk of being marginalized or excluded from society. The project team noticed that loneliness is a big problem for most young people outside the school system and employment, which is why young people need to find other youths in their area easily and informally. It was also clear that young people do not necessarily know the service system well or may not even know what services

might benefit them. The project team agreed that a current lack of engagement and knowledge should not be an obstacle to identifying and obtaining suitable services. The app was designed to help the user to find formal and informal events nearby. Formal events include, for example, sports activities or concerts and events organized by the city or an NGO, whether specifically youth-oriented or otherwise. Informal events include those based on a common hobby or interest, for example, people playing football together. Through this app, young people were able to find both kinds of activities and participate in them. The app includes a chat function to address the issue of attending events being daunting to the marginalized. The chat function offered a source of support to start a new hobby or simply just to get out and about. The app provides services both to anonymous and logged-in users. It provides more services to the latter group, but to lower the threshold, it was important that young people could also approach and use the app anonymously.

Tukemon Go is an application that maps youth services in a visually enticing way, utilizing gamification elements and artificial reality in a manner similar to Pokemon Go. Its popularity attests to gamification being an attractive co-creation option (e.g., Lember 2018). *Tukemon Go* consists of a digital platform showcasing local services. By clicking on a service, for example, a youth centre, the user accesses a visual and textual presentation of the place and videos of the staff from the centre. *Tukemon Go* is intended to lower the threshold for youths to visit new services, as they have already seen and heard the professionals involved. Ideally, the user will even be able to choose who to deal with from the centre involved. The app would also have a feature that enables users to send their contact information to a youth worker, who could help them find a way forward. The idea also contained some options for the user to suggest developments such as other functions and services that might be incorporated into the app to smooth participation.

The internet activity of vulnerable youths may not be productive in some terms (e.g., van Deursen & van Dijk 2014), but many do use social media extensively (e.g., Vainikka 2020). *Luuppi* is a digital application that helps professionals understand those who do not want to participate or are not even reached by traditional services. The typical user of the app is a service designer in a municipality undertaking development work. The app enables the real-time retrieval of social media data and the visual and interactive presentation of the results of its subsequent analysis. *Luuppi* helps explore what is happening, know how something is happening, and influence the course of its happening. The main operational logic of the app is as follows: First, the user can define a search that retrieves messages in real-time from a selected data source. The messages will be saved into the app's database. Second, the user can create dimensions and classes to classify messages into different categories. The user attaches keywords to those classes to label the messages based on them. For example, the user can create a dimension such as *obstacle*, attach classes such as *time*, *price*, *distance*, *professional's behaviour* and so on, and attach keywords to those classes such as *rude*, *arrogant*, *incompetent*, or *mocking* to the class *professional's behaviour*. Those labels will not be saved in the database, but the messages will be dynamically labelled on their way from the database to the user interface. That dimension can be used in the user's various projects in the application and

could potentially be shared with other users of the application. Third, the user can create visualizations and listings based on the dimensions and classes created; so the user might design an interactive line diagram to present how the number of mentions of different classes in the dimension *obstacle* has developed over the last year (assuming that the user has collected the messages for that long). Clicking the line *professional's behaviour* will generate a chronological listing of messages in that class.

AI was used to analyze messages published on *Hikikomero*, an anonymous chat room that is part of a discussion forum (see more Jalonen et al. 2021). The forum covers topics from all walks of life, including users' assessments of the quality or lack of public services. The forum's administrator defines the chat room as a peer group for depressed and socially withdrawn people. It is meant to cater to people who find everyday social interaction difficult. While not all users in the forum are *hikikomoris* who withdraw from society and seek extreme degrees of isolation and confinement (Furlong 2008), the assumption is that the young people who voice their opinions on *Hikikomero* do not participate in conventional co-creation activities, such as workshops and citizens' juries. Using performed topic modelling (Blei et al. 2003), a technique based on unsupervised machine learning (Shalev-Shwartz & Ben-David 2014), the Finnish CoSIE pilot team was able to analyze texts and identify themes and structures of discourses. Topic modelling uses messages and words (particularly nouns and verbs in this study) as units of analysis. The method assumes that each document is a collection of topics and that each word has a certain likelihood of featuring in the topic (Puschmann & Scheffer 2016). Subsequently, with the help of a machine learning algorithm, the team analyzed the discourses and the sentiments (Liu 2012) expressed in all messages. The four discourses identified represented different rhetorical appeals and linguistic features.

Among the main learnings from the *Hikikomero* case was the importance of acquiring different perspectives when setting the objectives for public service systems. Politically relevant discourses may be very different when viewed from the perspective of marginalized groups. These viewpoints may easily be overlooked if the knowledge base for decision-making is based merely on the opinions of the active and participatory elite. Using unsupervised machine learning to make sense of social media discourses is consistent with calls for the increased use of AI in the public sector (e.g., OECD 2019). Digital technologies can be used to capture large datasets, creating the big picture and framing the data in a meaningful way. The use of social media discussions in the co-creation of public services is also in line with the OECD's Office of Public Sector Innovation policy recommendations, which emphasize, among other aspects, dialogue between government and citizens and the active collection of civic feedback.

Brandsen (2021) states the main barriers to participation by vulnerable groups are scarcity of time, skills, and cultural capital, and also insecurity and a perceived lack of conviction on the part of professionals. The CoSIE Finnish pilot initiatives responded by offering an option to participate from home and by utilizing visuals. The project also encouraged professionals to rely not only on research knowledge by combining large datasets and open data with anonymous uncensored quotes from social media, which offered an effective combination of generalizability and personal information.

Discussion and conclusions

Digitally enabled co-creation can be understood as a process consisting of three consecutive phases: sensing, sensemaking, and seizing (Figure 2.1; for more on the three s's, see, e.g., Teece et al. 2016). *Sensing* refers to collecting and organizing data from social media and other sources. Mapping the context of co-creation helps a public service organization understand *what is happening* in the environment. Typical probing questions asked to garner input into co-creation would seek to isolate needs and expectations. *Sensemaking* aims to add value to the data extracted in the sensing phase. Sensemaking links causes to consequences by providing answers to questions of *how and why something is happening*. The output of sensemaking is service designers having access to an enhanced knowledge base related to the challenges young people face. *Seizing* focuses on the change and creating new actionable solutions and opportunities. The outcome of seizing is learning from the data in a way that enables to *influence events as they happen*.

Prior research showcases the lack of evidence on how the vulnerable can be integrated into co-creation activities for public services, yet still little is known of how digital technologies can be used to improve the level of participation of citizens, whether vulnerable or not. The current research addresses the challenges of making youths in a vulnerable position real contributors to the co-creation of public services by calling for a conceptual understanding with managerial implications. The chapter concludes with four propositions.

First, every technology has its advantages and disadvantages. In addition to intended and desirable outcomes, there is a risk of unintended and undesirable consequences. That being so, we favour the analysis of socio-technological factors and the dynamics within complex systems that lead to failures. Jalonen et al. (2021) have suggested that optimal value co-creation builds on a dynamic balance between exploitation and exploration activities. Exploitation is characterized as refining, selecting, implementing, and executing operations, whereas exploration is an organizational activity based on searching, risk-taking, playing, experimenting, discovering, and innovating (March 1991). The key question, therefore, is to what extent digital technologies distort the co-creation process. Where exploration dominates and exploitation is subservient, the result is a kind of pop-up participation. The opposite, participative diversion, may emerge when exploration activities decrease while exploitation remains at a high level. Where digital technologies support neither exploration nor exploitation, there is a risk of co-destruction powered by systemic distortion (Jalonen et al. 2020).

Second, co-creation should not be assumed to be a process where the value of public service is something that can be delivered by a public service organization to the citizen. Instead, value is something that emerges from interaction and is defined by the citizen. Public service organizations can facilitate, but not dictate, the value creation process (e.g., Osborne 2018; Grönroos 2019). Reaping the benefits of co-creation requires a focus on the justifications through which citizens make services relevant to them. As the same service can be justified on many different grounds (e.g., Boltanski & Thévenot 2006) and, correspondingly, the acquisition of very different services can be justified for similar reasons, services must be

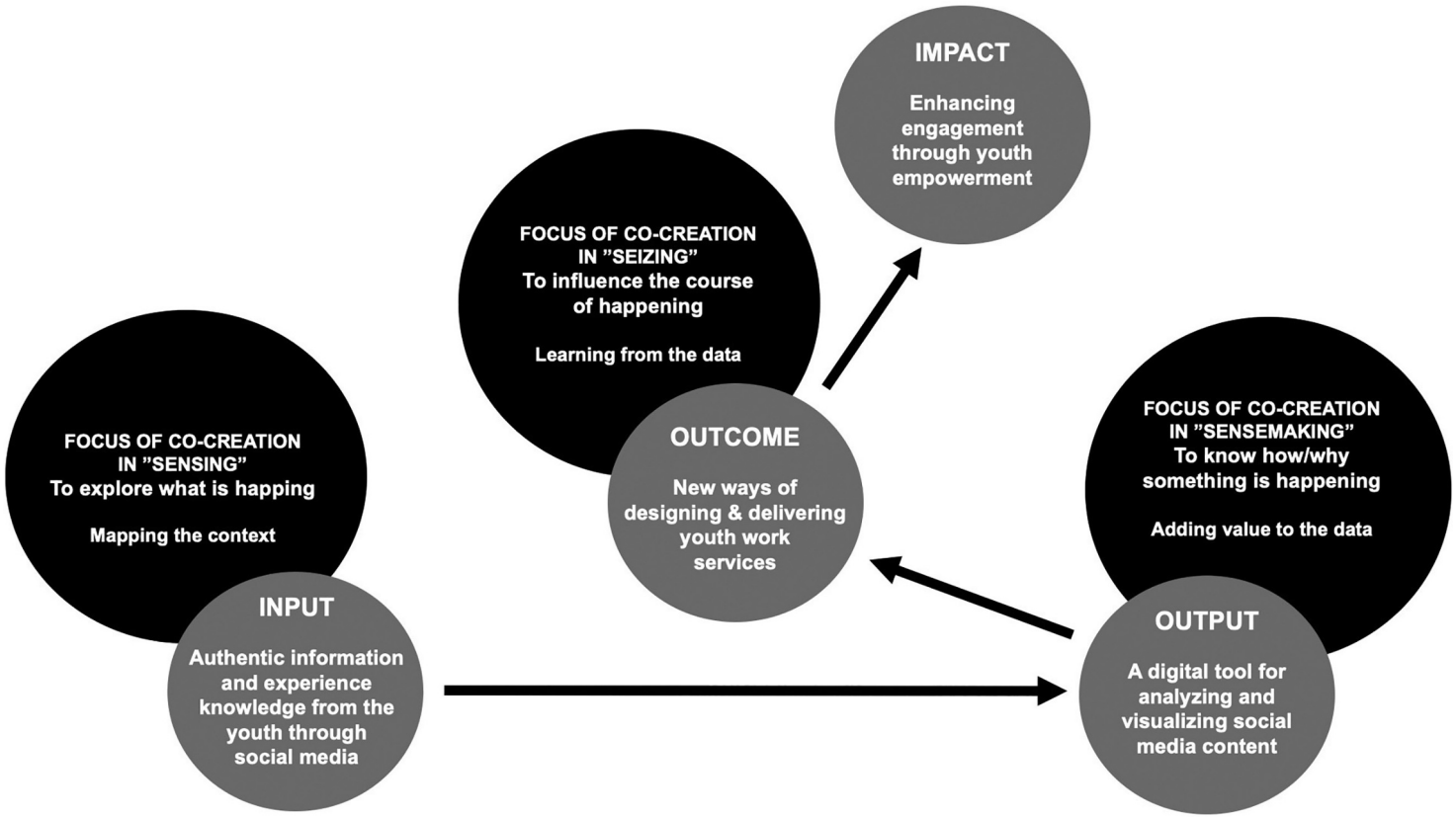

Figure 2.1 Sensing, sensemaking, and seizing in co-creating public services.

assessed based on users' needs and expectations rather than on the attributes of the services. This is particularly important for marginalized young people, as, for some, marginalization is a badge of their struggle against the values of society that they perceive to be alien to their own. Building on Jamieson et al. (2019), we propose that the needs, requirements, and interpretations of young people should be considered in a co-creative manner.

Third, a public sector that makes an effort to be digital (Negroponte 1995) and employs social media improves its chances of reaching the once unreachable. Doing so, however, requires a great deal of both the public service system and individual officials. Many managerial tasks must be prioritized to harness the full potential of digitalization, which includes, but is not limited to, acquiring technological expertise, creating a dynamic and agile organizational culture, encouraging public organization personnel to experiment, and boldly applying innovative approaches to reach the unreachable. When the risk of failure is obvious, the odds are that users will not be considered experts but troublemakers. This thought is in line, for example, with Meriluoto's (2018) findings related to the configuration of expertise as a prerequisite of participation. As Meriluoto describes it, the epistemic threshold enables a public-sector organization to choose participants according to its predefined and conscious or unconscious objectives. Instead of seeking experiences that can challenge the status quo, public service organizations are often biased towards knowledge production, thus reaffirming the status quo.

Fourth, studies have pointed out that while open data and social media have the potential to extend government services and engage citizens through innovation processes, that same social media has simultaneously introduced new challenges related to accessibility and social inclusion (Bertot et al. 2012; Lassinantti et al. 2019). Of particular interest has been whether opportunities for co-creation through digital technologies "will exist for all, or only a select few" (Lember et al. 2019). Social media may offer new possibilities for those who are already in control and able to navigate co-creative processes but exclude people with disabilities and other forms of vulnerability. Therefore, we propose that the aim of using digital technologies in co-creation processes should be to move beyond standard practice, not only by increasing engagement but also by broadening its scope. More specifically, the inclusion of vulnerable groups in co-creation processes requires a focus on the barriers that prevent such people from participating and translating that knowledge into actionable guidelines and practical tools.

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