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Detecting and managing the mechanism of perceived meaningfulness of work and digital transformation in public sector health and social care services

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ABSTRACT

This paper provides new insights into perceptions of the meaningfulness of work of service professionals and how it is constructed in the new context of digitalised health and social care long-term services, intended to offer co-created services. It elucidates the criteria evaluating the success of the digital services from the viewpoint of the service professionals. The paper presents case data from advanced digitalised services in Finland based on in-depth interviews with eighteen service professionals. Citing a broad range of literature, the paper carefully defines meaningfulness and co-creation in the context of long-term social and healthcare services and using a Vygotskian approach to social learning, it provides evidence of how context influences perceptions of successful change and of meaningfulness. In doing so, the paper suggests that the context for these digitalised services is best viewed from: (a) the stakeholder ecosystem, (b) the service context and (c) the service delivery framework. While most research on digitalized health and social care services focuses solely on the success or failure of the service, this paper adds to the body of knowledge around the impact of the meaningfulness of work for the professionals involved. The paper concludes with recommendations for influencing meaningfulness in relation to digital co-creation platforms in public sector health and social care services.

1. Introduction

As Annarelli et al. (2021) and Schiavone et al. (2021) describe, digitally transformed services invariably alter organisational structures and service delivery models, since decision-making powers move closer to the points of customer contact and as Nadkarni and Prügl (2021) and Hess et al. (2016) highlight introduce new ways of provider-customer interactivity mediated *via* information and communications technologies (ICTs). A burgeoning literature - including Aceros et al. (2015), Mettler and Pinto (2018), Balta et al. (2021) - suggests that such digitalization can modernize health and social care systems. Often focused on the technology or service outcomes, previous research has largely ignored the changes in meaningfulness felt by service professionals and how meaningfulness can be influenced. Virtanen and Stenvall et al. (2018) and Hanelt et al. (2021) are examples. This study explores how the meaningfulness of work and relationships changes when the provision of long-term health and social care services to older people is digitalized and the processes/events influencing the renegotiation of meaningfulness as perceived by the professionals providing services. This builds on previous work relating to cocreation of services in a digital environment including Osborne (2018) and Tirronen et al. (2021) and Kuoppakangas et al. (2020) which suggests that as new practices develop, so too is the meaningfulness of practice altered.

These issues are highly significant since as the World Bank (2019) and others note demographic change results in rising costs of health and social care, driving as Ahmadinia and Eriksson-Backa (2020) note, the adoption of time and cost saving digital technologies and the associated changes in service ecosystems Basole (2014) and others identify. Crowley and Heyer (2011) note the mutual interdependency of culture and technology in services interacting as both cause and effect.

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Studies such as those by Lolich et al. (2019), Ahmadinia and Eriksson-Backa (2020), and Kuoppakangas et al. (2020) while exploring enablers and barriers to the acceptance or rejection of e-health and e-welfare do not comment on the meaningfulness of new arrangements for professional staff, a point made by Bullinger et al. (2012). Other studies focus on co-creation, (Yeoman, 2014; Martela and Pessi, 2018 and Osborne, 2018 are examples) without delving into the reshaping and renegotiating of meaningfulness as perceived by professional staff using new digital platforms. This study addresses this gap, anticipating lessons for influencing the social learning processes in future digitalization processes.

Hence, the research question for this study is *How is perceived meaningfulness of work constructed among LTHC professionals in the context of co-creating LTHC services on a digital platform?* This question addresses gaps in the literature. For example, Aceros et al. (2015) emphasize only the technical success of e-health and telecare digital systems.

After defining meaningfulness and co-creating digital platforms in long-term care services, the paper outlines a social learning approach for understanding the renegotiation of meaningfulness of work and relationships in digitalization processes. Following an explanation of method and data gathering, presentation and analysis, data from eighteen original interviews are presented. After analysis of the study, the paper presents conclusions triangulated with previous research indicating its theoretical contribution and lessons for practice.

2. Conceptual frameworks

This section is in three parts: firstly, defining meaningfulness, secondly elucidating the context of digital platforms and co-creation in long-term health and social care services, and thirdly outlining the lens of social learning as it applies to renegotiating meaningfulness.

2.1. Meaningfulness

Since McLeod's (2007) idea of a hierarchy of needs, we have understood that meaningfulness of work activity and relationships is important for motivation, retention and desire to improve. Meaningfulness is especially important in service, whereas Norman (2002) insists the subjective experience of recipients is an important evaluative metric of success. From the perspective of service professionals, meaningfulness is more than the in-the-head experience suggested by Frankl (1946/1984) and more recently Yeoman (2014). We dispute Wong's (2016) notion that meaningfulness is primarily psychological, since the practice context, including quality of relationships and delivery of tangible elements of service are also important components of meaningfulness. His argument that self-transcendence and growth constitute meaningfulness misses the point that individual service providers also (not instead) relate to the quality of the service offered, which necessarily includes the provision of tangible elements such as meal delivery, cleaning, homecare. Meaningful work has an emotional therefore subjective and psychological element, it also relates to the practical value to clients of the services: staff cannot take pride in a service that does not solve clients' problems.

Holbrook's (1977) general point that cognitive and emotional humans seek meaning in their existence, Baumeister and Vohs' (2002) *hardwired to seek meaning*, is persuasive, and supports Martela and Pessi's (2018) contention that absence of meaning (Durkheim's *anomie*) may result in psychological illness affecting conduct in and outside work relationships. Their literature review of meaningful work argues that *significance, self-realization, and broader purpose* constitute meaningfulness, which unlike Lepisto and Pratt (2017), they argue are interrelated.

Our view is that *broader purpose* needs unpacking: for service professionals this is more than Wrzesniewski et al.'s (1997) *calling* or Koltko-Rivera's (2006) *self-transcendence* and instead must feature an evaluation of the service as effectively solving problems which otherwise clients would suffer from. Hence, solving problems acquires learning and adoption to changing service demands simultaneously facing new emotions, feelings of identity and meaningfulness (*i.e.*, Engeström 2007). Furthermore, in rather abstract terms Wolfs (2010:9) expresses this as *meaning arises when subjective attraction meets objective attractiveness, i.e.*, meaningfulness is more than the individual subjective preference or satisfaction to which Christman (2002) refers or Arnold et al's (2007) extrinsic outcomes, such as salary. If you are going over this ground, a more grounded approach is that of Ryan and Deci (2000) who have a more relational and cooperative view of people working together achieving self-determination meaning psychological and emotional needs - autonomy, competence and relatedness, and more meaningfulness from the relationships.

We chose to reinterpret Martela and Pessi's (2018) dimensions of meaningfulness, arguing that it has three dimensions, thus, their dimensions fit well the context social care to provide more understanding to the aim of the study. Firstly, that the service delivery functions, intangible and tangible, at work significantly and successfully affect the lives of clients and ability to act as citizens. Secondly, meaningful work in Chalofsky and Cavallaro's (2013:332) phrase reflects *who we are* – the work functions and identity (emotions, self-awareness and esteem) creating correspondences between who we are with what we do and how we relate to others (clients and colleagues). Thirdly, wellbeing is pride and satisfaction in the service delivered, in this case digitally enabled long-term health and social care, This refers to accepting that the digital services improve quality of care and relationships for recipients as compared with other possible service models, including the non-digital services it replaces. This third factor includes learning how the digital aspect of the services positively interrelates with the delivery of tangible service elements. These three factors along with learning for the purpose of this paper define meaningfulness from the perspective of professional service providers.

2.2. Digital platform and co-creation

What is a digital service platform, how does it enable cocreation of services and why (and how) is it superior to analogue services? Digital platforms are now ubiquitous in banking and healthcare (De Reuver et al., 2013), energy (Kiesling, 2016), and transport (Svahn et al., 2015), with the scope and use of Amazon, YouTube, and Facebook growing (Gorwa, 2019).

Since Gawer and Cusumano (2002) we have understood the power of platform technology to increase speed and accuracy of transactions, while reducing costs and adding service diversity. Transactional platforms interact with technological complementarities (GPS, credit-card payments, databases, call centers) and physical service (delivery, access, enabled physical interactions). Bringing a wide range of agents, institutions and technologies together, as Sedera et al. (2016) and Koskinen et al. (2019) conclude makes definition of platform difficult and as Yablonsky (2018) suggests, contextually specific (See *e.g.* Talonen et al., 2021; Talonen et al., 2022). Definitions often focus on technologies (Kenney and Zysman, 2016; Sedera et al., 2016) or organisational structures or as Tilson et al. (2010) suggest, organisational structures and functionalities. Other definitions/descriptions refer to social behaviours (Eaton et al., 2015) or sociotechnical characteristics (Gorwa, 2019).

This paper is concerned with a non-transactional, not-for-profit platform, in this case relating to health and social care. In Hallerstede et al.'s (2013) terms, this is a virtual environment initiated by the public service organizer, enabling the voluntary interaction between provider and servicer user agents and other stakeholders (partners, delivery agencies) seeking to solve clients' problems.

As Osborne (2018) notes, local public service platforms are intended to improve co-create services by offering clients a personalized mix of services, which the client co-creates by choosing and in some cases assisting in service implementation (exercise programme, medications, diet, attendance at events). Such platforms may encourage bottom-up

group formation and participating in virtual or physical social groups (Gorwa, 2019). Platforms may assist in service design or policymaking; an example being outlined by Quirky (2020). However, our interest is in service delivery.

The CXP platform in this study is a technological tool aiming to facilitate the online co-creation of services. It connects service users (demand) and service providers (supply) to participate in the design and development of new services in bottom-up vein on digital platform, assuring the end users' voices are iteratively heard and considered.

While de Reuver et al. (2018) confine research to public service platforms they deem as successful, our concern is more nuanced, using the three dimensions of meaningfulness outlined above from the perspective of professional service providers. Platforms offering long-term health and social care face specific challenges such as those related to meaningfulness, as our analysis below illustrates.

2.3. Social learning and personal meaningfulness

As a human-centred phenomenon, organisational learning has attracted an extensive amount of scholarly interest (see *e.g.* Brandi and Elkjaer, 2012). One of the influential approaches was introduced by Peter Senge in his book 'The Fifth Discipline' in 1990. According to the name of the book, Senge built his model of a learning organization on five disciplines that were systems thinking, personal mastery, mental models, shared vision, and team learning. Personal mastery refers to ones' growth in terms of skills and knowledge, while mental models describe individual level worldview and understanding of the reality and how they can be "adjusted and refined" (see also Hansen et al., 2020). With shared vision, Senge points towards the importance of providing individuals a "larger than oneself" direction and purpose to be part of. Shared vision acts as a motivational force for individuals to work and learn in an organization. Furthermore, team learning refers to the idea that individuals in organizations learn through dialogue between each other. In this conjunction, Senge's "fifth discipline"– systems thinking – emphasizes the importance of seeing the impact of decisions on larger wholes. As such, organizations should not be studied solely by considering their parts or functions but seeing them more holistically as wholes. According to this idea, learning in an organization is not a centrally led phenomenon but rather a process where individual persons' actions impact each other in a complex way. Critique on Senge's treatise on organisational learning has revolved partly around commenting the lack of social processes and practices of learning (*e.g.* Caldwell, 2012).

In this article, drawing on the social learning approach of the Russian pedagogist Lev Vygotsky (1926) and Engestr€om and Kerouac's (2007) concept of *expansive cycles of learning* we envisage renegotiation of meaningfulness as a learning process, part of identity renewal in the context of the new digital services. Fig. 1 illustrates social learning as beginning with individual cognitions and adjusted emotional attachments (to colleagues, clients and the services). The individual in the top-left is reflecting on their new functionalities, new relationships, new challenges to deliver an improved quality of service to clients. They bring their cognitions assessing the new services and their emotional evaluations of the services and relationships to their work team and other stakeholders (top-right) swapping stories, evaluations, emotions, distributing their own learning and learning from others to hone and polish their evaluation of the new service and how their identities are altering creating shared, perhaps disputed and conflicting objective and subjective evaluations and repositioning of themselves. In doing so, they reference (bottom-left) the 'hard' context of the new services: how do the tangible and intangible elements interact, is the service efficient and effective, how is the wider service ecosystem affected? Individually and collectively, service delivery agents consider (bottom-right) how the new service fits with their occupational culture, the wider caring and welfare culture of Finland, the goals of services to older people. Finally, a new set of learnings emerge (centre of Fig. 1) combining their learnings, new emotions, feelings of identity and meaningfulness. Having dug ever-more deeply into new roles, relationships and responsibilities, (this is the expansive cycles of learning) the individual and groups assess how meaningful the new service is to them and the clients: their self-awareness as providers of long-term social and healthcare for the older people, noting client dependency and vulnerability and perhaps self-esteem as professionals.

Having assembled our conceptual frameworks by defining meaningfulness and co-creation using platform technology and our social learning approach to professionals evaluating the new service model, we now turn to the empirical evidence we have garnered, beginning first with an overview of research method.

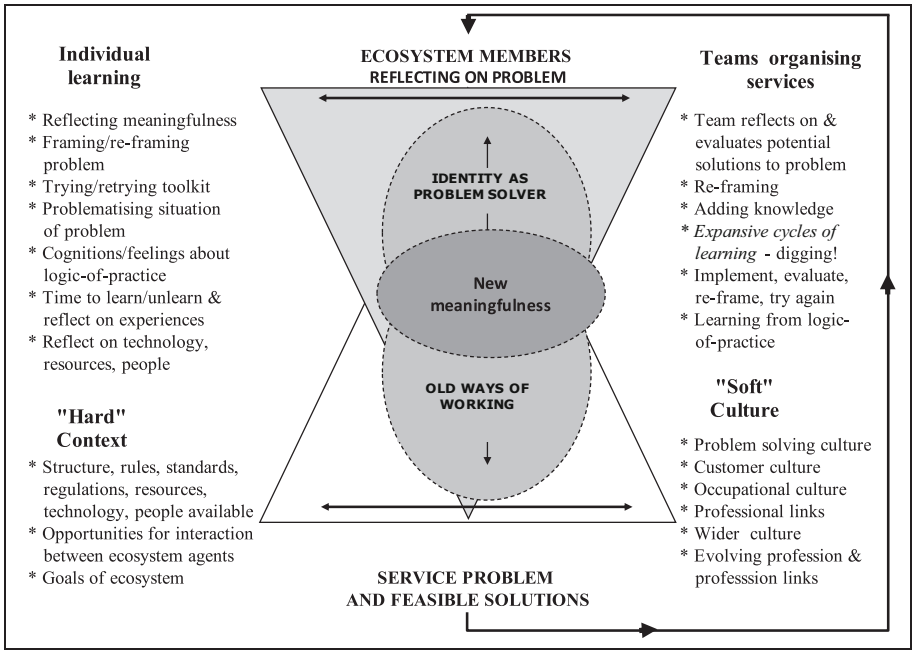

Fig. 1. Social learning framework.

3. Method

The empirical data reported for this article was gathered from the Finnish research site in the Horizon 2020 project entitled CXP during 2018–2021. The CXP project seeks to respond to the growing demographic challenges of an ageing population in Europe, thus improving the accessibility and responsiveness of social and care services with the help of ICT and using co-creation methods. This project addresses gaps in the area of social services by introducing a multi-stakeholder platform for the co-creation process and the later deployment of LTC services (*insert link to project here after peer-review process*). In the case of Finland, LTC services are provided for older people living at home by homecare professionals: technologically-assisted independent living. The empirical research data were collected to explore homecare professionals' views of the perceived meaningfulness of co-creating LTHC services on a digital platform.

Finland has a universal public health and social care system funded through taxation, provided by municipalities. The Finnish study focuses on the city of Tampere, with a population of 329,000 and 19 % of its citizens aged 65 and over (Väestökatsaus, 2020). It is major provider of care services for older people. The city of Tampere is currently reforming its organization and service production from a purchaser-provider model to a new approach emphasizing co-creation and participation. A current policy environment provides a unique opportunity to study co-creation in the context of service renewal. This study explores co-creation activities within a well-established and regulated environment emphasizing the interplay between co-creation and democratic participation as well as centrally organized customer flows and locally tailored solutions.

Researchers worked closely with local health and social care service professionals. Ethics approval for the study was obtained from the case organization and respective university in Finland.

This study presents a qualitative case study (Yin, 2003) applying thematic content data analysis (Silverman, 2011). Halinen and Tornroos (2005) argue that case studies are suitable for complex and context-specific investigations, providing an in-depth view of the topic under scrutiny. The case organization under scrutiny is the City of Tampere and the LTHC care professionals. The purposeful sampling (*e.g.*, Strauss and Corbin, 1998) method was used to recruit informants, specifically those persons connected to digital platform content and co-creation for LTHC services in the Tampere region who had participated in the CXP project's co-creation workshops and pilot program for the digital co-creation platform during the years 2018–2020.

The informants consist of LTHC professionals, line managers, and decision-makers. For reasons of anonymity, the interviewees have been coded as such: I = informant followed by a number or letter (see Table 1) when data citations are presented in the results section (Silverman, 2011). Eighteen in-depth thematic interviews were conducted in March–May 2020 after pilot testing the CXP co-creation platform and before its final form in the roll-out stage.

The main thematic interview question asked the informants, *what role does a digital co-creation platform have in your work and in developing LTHC services, and how useful do you find it?* All interviews were carried out in Finnish and audio recorded. The recordings were transcribed (and later translated into English) for future content analysis, which was carried out using Atlas.ti and by applying the abductive method, through which the analysis is data driven and guided by theory (Silverman, 2011), relying on the three dimensions of meaningful work, *significance, self-realization, and broader purpose* (Martela and Pessi, 2018), as units of analysis.

The data analysis was conducted in three phases, beginning with reading all the transcribed interviews to form a general overview of the data for thematic grouping in Atlas.ti and guided by the interview theme, which took the form of the following research question: *How is the perceived meaningfulness of work constructed among LTHC professionals in the context of co-creating LTHC services on a digital platform?* In the second phase, and in line with abductive logic (Silverman, 2011), the existing theoretical framework and empirical data were revisited and further coded with Atlas.ti. We began the abductive coding process by going through the transcripts line by line to identify what significance, self-realization, and broader purpose a digital co-creation platform may have in their work and in developing LTHC services (Table 2).

Following Silverman (2011), we proposed a wide range of initial codes. The third phase of data analysis consisted of dividing the initial codes into thematic groups. The coding process resulted in three thematic topics: 1) *perceived meaningfulness in different social groups (stakeholder ecosystem)*; 2) *perceived meaningfulness in different contexts* (COVID-19 and among older people); 3) *strengthening know-how and technological development* (framework). They are next presented in the results section as abstract constructs that are deployed to report findings from the interviews.

4. Results

4.1. Perceived meaningfulness in stakeholder ecosystem

4.1.1. Significance, self-realization, and broader purpose

According to the informants, knowledge transfer is possible when a co-created digital platform can encourage stakeholders to engage in participation. Careful selection of co-creation partners from different stakeholder groups with the core goal of co-creation may add perceived significance to co-creating a digital platform. Encouraging people to

Table 1
Anonymized interviewee code, profession, position.

Informants		
I-a	Homecare; Nurse	LTHC
I-b	Homecare; Nurse	LTHC
I-c	Homecare; Nurse	LTHC
I-d	Homecare; Nurse	LTHC
I-e	Homecare; Nurse	LTHC
I-f	Homecare; Nurse	LTHC
I-g	Homecare; Nurse	LTHC
I-h	Homecare; Nurse	LTHC
I-i	Homecare; Nurse	LTHC
I-j	Homecare; Supervisor	LTHC
I-k	Homecare; Supervisor	LTHC
I-12	Service for older people	Home living support services; Manager
I-13	Health & social care	Development expert; Manager
I-14	Health & social care	Research & development expert
I-15	Health & social care	Development director
I-16	Health & social care	Service director; Digital expert
I-17	Digital service expert; Technology	Director
I-18	Digital services	Expert

Table 2
Example of the coding process.

Basic statement	Initial code	Thematic code	Theoretical coding
"*When we manage to get people together to co-create on the digital platform, it definitely provides learning experiences at many levels*." (I-d) "*The idea of co-creation has brought added value and especially the realization that older people may effectively participate in co-creation is valuable. The digital platform maybe then has indirect effects*." (I-14)	Learning and know-how enhance self-realization and add to the broader purpose. Participation adds to its significance. Participation adds to self-realization. Participation adds to broader purpose.	Strengthening know-how and technological development (framework)	Perceived meaningfulness of work amidst of digital transformation process.

participate and promising that their needs and ideas will be realized in the co-creation of new services and learning together may further support the process.

> It could have an impact, especially as the public sector's services become even more transparent via co-creation, when citizens are included in the service development processes.
>
> (I-15)

> When looking at the ongoing social and healthcare reform [platforms] we use Innokylä, Teams, and Skype, [they need] to develop together.
>
> (I-c)

While a CXP digital platform adds value, its overall advantage is somewhat unclear according to the empirical data. During the data gathering process, the CXP platform did not yet meet expectations in terms of functionality, agility, and technicality at the level of already existing and well-functioning digital platforms, namely Innokylä, Teams, and Skype. However, the informants talked about how bringing different stakeholders, care professions, clients, informal cares, service providers, and policymakers to work together on the same platform helps learning and create novel ideas and contribute to future developments in the co-creation process, especially new services, thus serving a broader purpose.

> Co-creation has brought people together. It is really a huge thing that people get together and begin to think in a coordinated manner about these matters together. I truly believe in co-creation where people gather together around same theme. It may address really important future issues. However, does it need a digital platform? I am not sure, especially if it is not easy to use. Currently you cannot see any added value in it.
>
> (I-a)

> Co-creation has advanced service development. Surely also the idea of digitalization has been enhanced.
>
> (I-c)

The empirical data do not directly indicate that a co-created CXP digital platform itself has boosted digitalization as opposed to the COVID-19 pandemic, which has increased care professionals' desire for digital transformation. Furthermore, the informants felt their ideas were easily lost in the digital co-creation process due to technical problems and the rigidity of the platform, consequently degrading the significance and self-realization of the co-creation process.

> The LTHC professionals' work-related processes and ways of utilizing digital tools in their work has been enhanced exponentially, and actually very quickly and on a very short timeline [during the COVID-19 pandemic]. The CXP platform itself has not affected this change. I think that digitalization is here to stay; it is going to be big. The care professionals' working culture is changing and crisis resilience is growing.
>
> (I-k)

> No, there have not been any changes in professionals' work-related processes as advanced by [particularly] the CXP platform.
>
> (I-12)

> There will surely be changes in care professionals' work processes, and it depends also on how far and well-functioning the CXP platform will be when the project ends, but at least the face-to-face co-creation workshops have been a success and we have developed services.
>
> (I-c)

Learning together *via* co-creation how intangible and tangible services are changing along with digitalization the interviewees expressed that the ways of working are also changing. It does affect the self-realization and emotions attached to it. The interviewees remarked that co-creation has potential when developing LTHC services and homecare professionals' work-related processes. However, due to the COVID-19 crisis, the digital platform should be user-friendly enough for co-creation and satisfy the broader purpose, in other words, the growing demands for novel LTHC service provision.

4.2. Perceived meaningfulness in various contexts (COVID-19, older people)

4.2.1. Significance, self-realization, and broader purpose

According to the empirical data, participants did not find the co-creation digital platform attractive and felt it provides little added value to LTHC care professionals' work. However, the significance of digital technology began to take on a larger role during the COVID-19 pandemic. The LTHC clients (older people and their informal caregivers) offered feedback to the LTHC professionals on how digital technology had provided support and self-realization opportunities by aiding their communication, expressing their concerns and emotions with family members and care professionals during the pandemic and lockdown, thus supporting self-realization. Loneliness among older people living at home also created concerns about their well-being among their informal careers and family members. The informants also discussed the existing videophone tool used in LTHC services in other words intangible and tangible services how they changed during the pandemic. The videophone provides a communication channel for homecare professionals, clients, and their families simultaneously providing shared learning endeavour into digitalization of LTHC services and providing practical solution to clients' needs.

> The current COVID-19 pandemic does stress the positive aspects of digitalization and platforms. When we think about older people + 70 years of age, they were very lonely during the lockdown, and they needed social contacts. However, at the moment such a digital platform does not bring value like the videophone does. And also, digitalization has been boosted and the idea of LTHC working remotely as much as possible [has gained traction].

(I-a)

> Surely the pandemic has boosted digitalization, and not only the use of phones but the use of videophones. The meaningfulness of all kinds of digital tools has been enhanced.

(I-d)

The informants noted that a co-created digital platform may decrease in significance among care professionals if used mainly for socialization purposes. Hence, care professionals have been facing a growing workload and issues that immediately need to be reconciled due to the pandemic, including both new LTHC services and new ways of working, such as remotely. In such a situation, the co-creation of LTHC services can yield user-friendly tools that serve learning and consequently a broader purpose.

> My understanding is that LTHC professionals and also decision makers or any other busy people will not get added value from co-creating a digital platform if it is mainly used for just socializing.

(I-12)

Some informants remarked that use of a co-created digital platform may impair the quality of LTHC services rather than enhance them, consequently jeopardizing the co-created digital platform's perceived significance and broader purpose. However, opportunities may exist for bringing people together on a digital platform to co-create LTHC services. One key matter is the quality assurance of the services co-created on the digital platform and how they might affect the existing tangible and intangible services. Informants were also concerned about whether all participating stakeholders' ideas and opinions are being communicated and considered sufficiently and in a transparent manner during the co-creation processes on a digital platform, it also enhances learning process.

> Of course, in the long term such a digital co-creation platform may enhance the quality of the services, but only if the private and public service providers can exploit the platform and then get all the different stakeholders to provide input during the co-creation [process]. There are a lot of questions concerning this, for example the quality of the services, the procurement of the services, and who will actually use the services?

(I-16)

> If the CXP digital platform would be utilized, it would impair the quality of the current services. It would surely not enhance the quality.

(I-d)

> One problem is that the city cannot recommend any services to citizens unless they are strictly quality checked.

(I-14)

The empirical data revealed how stakeholders experienced technical problems while endeavouring to co-create on a digital platform. Hence, the rigidity of the digital platform reduced the perceived significance of their contribution and self-realization opportunities while participating in co-creation work. According to the informants, the idea of partaking in co-creating LTHC services is more appealing than the idea of using the digital platform itself. When stakeholders participated in the co-creation work they especially reported feeling that their opinions and ideas are genuinely noticed and taken into consideration in the co-creation process, thereby enhancing learning and self-realization.

> Somehow, one good issue about such a digital platform is that a vast number of people may co-create it together, and simultaneously this creates a feeling of ownership of the developed service. So, it may support testing markets for different services.

(I-a)

> People might be more active in using such services that they have been co-creating.

(I-j)

> […] Due to Corona, care professionals have been forced to use digital tools now, even those who were reluctant to use them earlier.

(I-d)

> The current pandemic has mostly boosted digitalization, allowing for remote work and being in contact with LTHC clients. The CXP platform has not enhanced this at all.

(I-c)

The informants commented on how the COVID-19 pandemic pushed stakeholders to use digital tools and possibly apply the idea of co-creation. The pandemic lock-down forced stakeholders to work remotely: care professionals needed to learn new ways of working *i.e.*, check on their LTHC clients *via* videophone and clients needed to rely on digital solutions, including videophone, to communicate their needs. Meanwhile their informal caregivers/family members needed to reach out to care professionals and their older person to support living at home during the crisis. While seeing and communicating of their new ways of working the care professionals quickly learned that were able to help their clients and their informal careers *via* digital tool. According to the empirical data, digital tools like videophone and different digital platforms, namely WhatsApp and Skype, have provided significant experiences of self-realization among older people. It is enabling them to communicate and feel a sense of security during the pandemic lock-down, thus adding to their emotional well-being and broader purpose of the ecosystem.

4.3. Strengthening know-how and technological development (framework)

4.3.1. significance, self-realization, and broader purpose

According to the empirical data, it is possible to transfer experiences *via* a digital platform through learning from and applying the digital platform's features. However, the informants also expressed views on how face-to-face co-creation enhanced their self-realization opportunities even more than digital platform experiences.

> When we manage to get people together to co-create on the digital platform, it surely provides learning experiences at many levels.

(I-d)

> I really liked those face-to-face co-creation workshops; they are really suitable for many different purposes. And actually, when we work, for example, in Teams, we naturally might co-create on a "digital platform." We really do not need such a CXP digital platform for these purposes.

(I-14)

> All stakeholders were interested and keen on co-creating together in our face-to-face workshops [pre-COVID19], but the digital platform was a disappointment. The participants have been pleased with the face-to-face co-creation workshops though.

(I-12)

Informants noted that innovativeness has grown *via* learning and know-how that enhances self-realization opportunities among stakeholders, thus adding to the broader purpose of co-creating LTHC services. Their remarks dwelled on social learning experiences and sharing learning their own learning, emotions and learning from others.

> Learning must be an important aspect for people who have participated in the co-creation processes, and also at some level the testing of the digital platform for co-creation was also a learning process for

all participants. So, one can say that innovation and innovativeness have somewhat grown among the participants.

(I-d)

The learning process may have effects, since when people learn and adopt new types of operations and processes the results may be more effective outcomes and the organizations may become more efficient. So, in that sense there might be benefits and gains.

(I-f)

It is difficult to evaluate yet [learning effects]; it needs more time and usage to measure.

(I-a)

The added value of the CXP co-created digital platform was not always clear and its significance difficult to perceive during the data collection process. The idea of applying co-creation to service development processes can generate value and indeed such a co-created digital platform is needed. According to the empirical data, the stakeholders found the face-to-face co-creation workshops more valuable. They perceived that service users were more willing to participate in face-to-face co-creation events and communicate their needs, emotions including aspirations. Thus, supporting the significance, self-realization, and broader purpose of the platform.

When you think about it, co-creation does provide added value to service development because it brings in the genuine needs of the service users.

(I-12)

The idea of co-creation has brought added value, and especially the realization that older people may participate in co-creation effectively is valuable. The digital platform maybe also has indirect effects.

(I-14)

Yet, some informants also presented opposing views:

I would say the digital platform does not bring any added value to the co-creation process. Such apps and digital platforms actually bring added value in terms of connecting people socially rather than enhancing co-creation.

(I-a)

Many informants found the co-creation idea interesting and valuable in its own right. However, the incompleteness of the digital platform (CXP) negatively affected the satisfaction level of the stakeholders and jeopardized their perceived sense of self-realization and learning. The informants discussed the usability and functions of a co-created digital platform. The CXP digital co-created platform is orchestrated by moderators and facilitators ("gatekeepers"). Their role is to guide the co-creation processes to meet their end goals. However, the informants reported that the digital co-creation process was rigid and slow due to the "gatekeepers." In addition, informants felt that many of the suggested ideas were "lost" during the "gatekeeping" processes, meaning they were not able to see their message and ideas included on the digital platform. Moreover, the CXP platform does not have a video function, which decreased the stakeholders' engagement and interest in using it for co-creation work. Consequently, exposing the significance of the co-creation process on the platform.

The platform did not function very well yet, so we really did not get much out of it, which was a disappointment; we could not co-create the platform as much as we wished.

(I-17)

If the idea is that the home care customer gives feedback through the platform personally, the platform needs to be very simple and easy to use.

(I-g)

The empirical data provided only a weak indication of a willingness to use the CXP co-created digital platform, but informants felt it might be possible in the future, when the technical issues are resolved. The public sector can be an enabler for projects and a goal setter for co-creating LTHC services, enhancing learning and building broader purpose. The informants commented that the co-created digital platform could change LTHC service development directly. In addition, it may produce indirect changes as well, meaning that problem-solving and cost-savings issues should be reconsidered in the future reflected along with intangible and tangible services.

Surely in the future, we will apply co-creation to service development and then learn together. There are existing platforms in Tampere [i.e., Kotitori, Innokylä], and we may utilize them and maybe take some features from the CXP platform if there is something very useful.

(I-13)

Of course, if the co-creation method is used systematically in the long run and the digital co-creation is applied together with the face-to-face co-creation workshops, it has the potential to result in financial savings.

(I-15)

The informants also discussed how the digital platform could be integrated into an existing digital ecosystem or whether it should function as its own ecosystem. Some modules from the CXP platform could be integrated into existing ecosystems in the future, and that may add to learning experiences including the perceived significance and broader purpose of the platform.

5. Discussion: construction of perceived meaningfulness

The purpose of this study is to understand better how the perceived meaningfulness of work during digital transformation is constructed among LTHC care professionals in the context of developing LTHC services *via* co-creation on a digital platform. The research question is: *How is the perceived meaningfulness of work constructed among LTHC professionals in the context of co-creating LTHC services on a digital platform?* Hence, prior studies have predominantly focused on digital platform success stories (De Reuver et al., 2018). The empirical results from this study show that the perceived meaningfulness of co-creation process on a digital platform is constructed with social learning supporting it in 1) stakeholder ecosystem, 2) different contexts, and 3) different frameworks. Next, we scrutinize the findings of the results in terms of constructing perceived meaningfulness for digital co-creation work among LTHC professionals.

Regarding *construction of perceived meaningfulness in a stakeholder ecosystem*, the empirical evidence shows that all stakeholders who participated in co-creating LTHC services perceived its meaningfulness or meaninglessness in a similar manner (see Yeoman, 2014). The significance, self-realization, and broader purpose was enhanced when the various stakeholder participants involved felt that their ideas were considered and when the co-creation process transparently reflected how and why some of the participants' ideas were considered for future digital co-creation processes. The sense of being genuinely involved in the development process of new services supported Martela and Pessi's (2018) construction of meaningfulness. The importance of participants perceiving the process as significant learning from one another added to it, including self-realization opportunities and serving a broader purpose, which also reflects the findings of Kuoppakangas et al. (2020) regarding the use of a videophone in LTHC services. However, each of the three elements (significance, self-realization, and broader purpose) suffered when participants' felt that there was not clear reasoning and rationale behind how and why some ideas presented during the digital

co-creation process were accepted and others not. Thus, negatively affecting the perceived meaningfulness of their work when co-creating LTHC services on a digital platform. Here, we found that the mechanism of perceived meaningfulness facilitates the transparent flow of ideas, communication, and social learning during the digital co-creation processes, further supporting a perception of meaningfulness of work among the participants. These findings resonate with and add to the discussion by Lolich et al. (2019) that though the level of the communication between stakeholders is important to whether health and social care professionals accept or reject e-health initiatives, because it may still be ineffective, even when digital tools are applied.

Technical matters in terms of accessibility and the user-friendliness of the digital platform, including the digital abilities of the participants from stakeholder groups, also play a role in supporting social learning and *vice versa*. Technical skills and learning them enhanced the perceived meaningfulness of the digital co-creation work carried out within the ecosystem. These findings are in line with existing research on digitalization capabilities (Annarelli et al., 2021), on the relative maturity of the digital transformation process in healthcare (Mettler and Pinto, 2018), and on simultaneously adding novel insights to the perceived meaningfulness of digital co-creation work in similar contexts. Prior studies recognize that the essential goal in co-creating a digital platform is to enhance interaction and innovation within different stakeholder ecosystems in a bottom-up manner (Osborne, 2018; see also Gorwa, 2019). Our study adds to existing discussion about the aspect of social learning enhancing perceived meaningfulness. According to the empirical data for this case study, the technical functionality (agility and accessibility) of the co-created platform may either support or jeopardize the social learning experience and perceived meaningfulness of the co-creation work among the various stakeholder ecosystems (Vygotsky, 1926).

The empirical data revealed that the stakeholder ecosystem will turn to already familiar digital tools, such as the videophone or digital platforms like WhatsApp and Skype, if they are disappointed with the digital co-creation platform, for not being able to learn new technical skills. Familiar digital tools provide successful emotional experiences and significant self-realization opportunities, thus adding to the broader purpose of the ecosystem (Martela and Pessi, 2018). Hence, the findings from this study suggest that supporting participants' engagement and perceived meaningfulness of the digital co-creation work can be successfully supported by ensuring the accessibility, user-friendliness, and social learning experience (Vygotsky, 1926). It is important that there is adequate technical support, and transparency of the co-creation processes in terms of how and why ideas are or are not chosen for future development.

Moreover, *construction of meaningfulness in different contexts* (COVID-19, older people) can be understood by looking to existing knowledge on how social change stems from natural forces, technological change, and the intentional actions of diverse groups of people (*e.g.*, Gorwa, 2019). In this study, LTHC services especially were coercively added to the digitalization process during the COVID-19 pandemic (see also Kuoppakangas et al., 2020), thus enacting a coercive social change and digital transformation. Digital tools played a central role in aiding stakeholders to communicate with one another during the pandemic lockdown and enhance new ways of social learning related to digital tools. As described above, the CXP digital platform was still technically in an immature state (Mettler and Pinto, 2018) and not ready to be adjusted to meet the needs of the stakeholder ecosystem, meaning the co-creation work required agile adjustment to use the already existing videophone better, consequently triggering social change and digital transformation. Older people (LTHC clients), their informal caregivers, care professionals, and service providers all needed to be easily and equally engaged and connected to the end result of digital co-creation on a platform. According to the empirical findings from this study, digital tools began to assume a larger role in enhancing significance and self-realization for the stakeholders by enabling communication and social learning in the ecosystem and building security and safety measures during the COVID-19 pandemic, thus supporting the broader purpose of building perceived meaningfulness in digital co-creation work (Kuoppakangas et al., 2020; Martela and Pessi, 2018).

However, co-creation on a digital platform needs to be user friendly and, as reported above, technical obstacles emerged that decreased social learning flow including self-realization and significance for participants, thereby hindering the perceived meaningfulness of the co-creation work (see Annarelli et al., 2021). According to the results from this study, the stakeholder ecosystem and especially older people's digital abilities and skills require hands-on support when engaging with the digital co-creation platform (see also Lenka et al., 2017). Simultaneously, the COVID-19 pandemic created added pressures to co-create new LTHC services at a faster rate than the CXP digital platform allowed. In addition, the roles and processes of the moderators and facilitators when co-creating the digital platform slowed the process, though unintendedly. Consequently, co-creating a digital platform in the context of the stakeholder ecosystem, particularly with respect to the needs of older people and time constraints created by the COVID-19 pandemic, demanded more user-friendly tools to allow social learning to emerge and to serve the broader purpose of adding perceived meaningfulness to the work (Vygotsky, 1926; Martela and Pessi, 2018). These findings reflect the discussion by Garrety et al. (2014) on whether to abandon digitalization in healthcare, mainly because of the lack of fit between users and the technology (Balta et al., 2021).

The empirical findings presented in this study demonstrate that meaningfulness can be constructed in different contexts by building a supportive environment in which participants are given user friendly equal opportunity to co-create and social learning maintained. However, we found that managing the construction of perceived meaningfulness takes on different roles in different contexts, for instance building safety and wellbeing measures for LTHC clients during COVID-19 pandemic, supporting timely service provision by LTHC professionals, and enhancing the ability to adjust to clients' altering care needs by engaging clients in co-creating their own LTHC services. Regarding the emotional aspects, feelings of identity and meaningfulness in adoption to the changing service demands it seems that social learning supported them (Vygotsky, 1926). Social learning happens also when individuals and groups assess how meaningful the new service is to them and the clients. Simultaneously, quality assurance of the co-created services must be managed according to Ministry of Social Affairs and Health (2020) standards to enhance their perceived significance and broader purpose in different contexts.

In terms of constructing the perceived meaningfulness of co-creation work on a digital platform, we found that it improves when learning and know-how regarding the use of digital technology grew among the stakeholders (see also Tirronen et al., 2021; Lolich et al., 2019; Osborne, 2018) in other words *strengthening know-how and technological development*. The meaningfulness of co-creation work evidently flourished when stakeholder co-creation activities turned into learning outcomes and sharing them, that is, using the digital platform. In contrast, technical struggles and uncertainty about seeing one's ideas included in the co-creation processes on the digital platform evidently jeopardized a sense of self-realization (Martela and Pessi, 2018) and a willingness to engage and participate in such activities in the future. Thus, the perceived meaningfulness of co-creation work on a digital platform was lost. However, here the social learning appeared in building understanding of what is needed for meaningful digital co-creation (Vygotsky, 1926).

The empirical findings of this study highlight the role of transparently and inclusively considering stakeholders' needs with respect to learning new digital skills and creating ideas in co-creation processes that enhance the perceived meaningfulness of the work. As Hallerstede (2013) suggests, digital platforms are virtual environments initiated by an organizer who enables voluntary interaction between different actors and stakeholders who seek to solve and co-create innovative outcomes

(see also Daiberl et al., 2019). Our study also implies that social learning occurs in the interaction. In addition, empirical evidence from this study adds to those earlier findings, namely that perceived meaningfulness in co-creation work requires that all participants involved feel the work is equally transparent. All participants should have access to the digital platform and that technical challenges should be overcome swiftly to support learning and the exchange of knowledge.

More importantly, the findings of this study support prior research by Osborne (2018) and Gorwa (2019), who suggest that the goal of co-creating a digital platform is to enhance interaction and innovation in a novel way within and among the various stakeholder groups and communities in a bottom-up manner (see also Tirronen et al., 2021). Consequently, to achieve this goal all participants involved in co-creating a digital platform need to be engaged and supported in their effort to social learning throughout the process (Vygotsky, 1926). Furthermore, the results from this study show that in a technical context, a video option reinforced stakeholders' engagement and learning during the co-creation process, thereby enhancing the significance, self-realization and broader purpose of digital co-creation work among stakeholder ecosystems and simultaneously creating social learning and perceived meaningfulness. In addition to serving a broader purpose, technological development needs to meet the needs of the stakeholders to enhance the perceived meaningfulness of digital transformation work (*cf.* Balta et al., 2021; Zhao and Canales, 2021). According to the empirical data, the CXP platform still did not reach the level of technological development that those in the stakeholder ecosystem had expected when agreeing to participate in digital co-creation work. Thus, the social learning in the digital co-creation process on the platform suffered, as did significance and self-realization, resulting in diminished perceived meaningfulness of the co-creation work.

The discussion provided in this study sheds novel light on how digital transformation may benefit from social learning supporting construction of perceived meaningfulness of co-creation work among stakeholders (Vygotsky, 1926). While meaningfulness has been framed as a subjective experience, it also needs to be studied from the standpoint of social constructionism (see Berger and Luckmann, 1967; De Reuver et al., 2018). As Lips-Wiersma and Wright (2012) have suggested, perceived meaningfulness is constructed by belonging as opposed to doing and by self-actualization as opposed to serving others (see also Martela and Pessi, 2018). In other words, perceived meaningfulness may arise when different dimensions are in balance. Moreover, this study suggests that the perceived meaningfulness emerging from digital transformation and co-creation work support the development of important human capabilities through social learning and a sense of being able to do something worthwhile in mutually respectful collaboration with others (Kuoppakangas et al., 2019; Yeoman & O'Hara, 2017; Yeoman, 2014).

6. Conclusions

The paper outlined a social learning approach for understanding the renegotiation of the meaningfulness of work and relationships in digitalization processes. The purpose of this study was to improve understanding of *how perceived meaningfulness of work is constructed among LTHC professionals in the context of co-creating LTHC services on a digital platform.* In addition, this study has shed light on what may cause a digital co-creation platform to succeed or fail, whereas prior studies have predominantly focused just on success stories (De Reuver et al., 2018). As detected in this study, co-creation work on a digital platform succeeds or fails in line with each of the three dimensions of meaningful work: significance, self-realization, and broader purpose (Martela and Pessi, 2018). Consequently, the perceived meaningfulness of digital transformation decreases in relation to a digital co-creation platform when the needs and expectations of stakeholder ecosystems are not understood and met, when demands are not clearly declared and fulfilled, and when the expected technological development does not create genuine social learning and new know-how. Consequently, affecting the success of aimed organisational culture change in terms of co—creation and digitalisation of social and healthcare services. The role of managing change in digital transformation according to our study is to enable social learning and new know-how in organizations.

Based on this study, we suggest that creating perceived meaningfulness for a digital transformation in different cases is a key to successfully managing the mechanism of meaningfulness and subsequently supporting organisational culture change. Thus, understanding that the construction mechanism of perceived meaningfulness is not part of the status quo *per se*; instead, it is case and time sensitive and socially constructed, resulting from social interactions (Bailey et al., 2019; Berger and Luckmann, 1967; De Reuver et al., 2018). This finding adds to the extant knowledge on organisational culture change in terms of digital transformation in public sector health and social care services. Based on this study, we propose that the perceived meaningfulness of digital co-creation work should be constructed with social learning in: 1) the stakeholder ecosystem, 2) different contexts, and 3) different frameworks (strengthening know-how and technological development).

Therefore, based on the results from this study we argue that detecting how perceived meaningfulness is constructed in different cases is the key to managing the construction mechanism of meaningfulness. This provides another angle to existing research, arguing that perceived meaningfulness supports successful digital transformation, in other words, that they can be understood as two sides of the coin. In practice, the perceived meaningfulness of different stakeholder ecosystems can be built and enhanced by managing the detected construction of perceived meaningfulness. In addition, understanding that the mechanism of meaningfulness is context specific is an important theoretical and managerial, including change management and organisational culture change implication of this study.

Within the framework of know-how and technological development, this study adds to existing knowledge that a stakeholder ecosystem needs to have genuine learning experiences and that new technology needs to have a novelty value to support perceived meaningfulness, which may also enhance the success of the digital transformation in the context of public sector health and social care services. Thus, the accessibility and agility of a digital platform must be protected, and technical challenges must be overcome swiftly. Hence, supporting technological learning outcomes and the exchange of knowledge with social learning enhances the perceived meaningfulness of co-creation work on a digital platform, consequently enhancing the perceived meaningfulness of the digital transformation. In addition, the mechanism of meaningfulness and managing the construction of it will yield further interaction and innovation within stakeholder ecosystems and communities in a bottom-up manner, what also supports change management and organisational culture change.

In terms of the limitations of this qualitative case study, the empirical data reported here, and the findings, are specific and case sensitive to Finland, LTHC professionals and the CXP digital co-creation platform; the findings cannot be generalized. However, despite this limitation this study makes an important contribution in suggesting that social learning approach for understanding the renegotiation of meaningfulness of work and relationships in digitalization processes. Furthermore, the findings may resonate in other national contexts in terms of how to utilize co-creation digital platforms and support digital transformation. The exploration of these issues in different countries represents an interesting avenue for future research. Furthermore, in this study the perceived meaningfulness to LTHC professionals of co-creating work on a digital platform included their views and detected aspects of how LTHC clients and their informal caregivers acted and reacted to co-creation on a digital platform. Moreover, this study contributes new insights into the mechanism of perceived meaningfulness with respect to digital transformation, change management, organisational culture change and how they can be successfully supported *via* social learning. Specifically, the findings show that the construction of perceived meaningfulness for digital transformation takes place in:1) the

stakeholder ecosystem, 2) different contexts, and 3) different frameworks, when utilizing a digital platform for co-creation work. The findings thus support digital transformation and social change in developing health and social care services.

CRediT authorship contribution statement

All five authors: Kuoppakanagas, Stenvall, Kinder, Lindfors and Talonen have participated in the data gathering and analysis of the data at different stages. The main author Dr. Kuoppakangas has lead coordination of the crafting the manuscript and the revision of the manuscript. All authors have contributed to the content of the manuscript *via* writing different sections, participating in the article's workshops organized by Kuoppakangas. Dr. Tony Kinder took responsibility of the newly added Social Learning theory sections including re-analysis, results, discussion and conclusion and revision of the introduction section at the major revisions' phase of the manuscripts.

Data availability

The data that has been used is confidential.

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References

Aceros, J.C., Pols, J., Domènech, M., 2015. Where is grandma? Home telecare, good aging and the domestication of later life. Technol. Forecast. Soc. Chang. 93, 102–111.
Ahmadinia, H., Eriksson-Backa, K., 2020. E-health services and devices: availability, merits, and barriers - with some examples from Finland. Finn. J. eHealth eWelfare 12 (1), 10–21.
Annarelli, A., Battistella, C., Nonino, F., Parida, V., Pessot, E., 2021. Literature review on digitalization capabilities: co-citation analysis of antecedents, conceptualization and consequences. Technol. Forecast. Soc. Chang. 166, 120635.
Arnold, K.A., Turner, N., Barling, J., Kelloway, E.K., McKee, M.C., 2007. Transformational leadership and psychological well- being: the mediating role of meaningful work. J. Occup. Health Psychol. 12, 193–203.
Bailey, C., Lips-Wiersma, M., Madden, A., Yeoman, R., Thompson, M., Chalofsky, N., 2019. The five paradoxes of meaningful work: introduction to the special issue 'meaningful work: prospects for the 21st century'. J. Manag. Stud. 56 (3), 481–499.
Balta, M., Valsecchi, R., Papadopoulos, T., Bourne, D.J., 2021. Digitalization and co-creation of healthcare value: a case study in occupational health. Technol. Forecast. Soc. Chang. 168, 120785.
Basole, Rahul, 2014. Visual business ecosystem intelligence: lessons from the field. Comput. Graph. Appl., IEEE 34, 26–34.
Baumeister, R.F., Vohs, K.D., 2002. The pursuit of meaningful-ness in life. In: Snyder, C. R., Lopez, S.J. (Eds.), Handbook of Positive Psychology. Oxford University Press, New York, NY, pp. 608–618.
Berger, Peter L., Luckmann, Thomas, 1967. The Social Construction of Reality. Anchor, New York, NY.
Brandi, U., Elkjaer, B., 2012. Organizational learning viewed from a social learning perspective. In: Handbook of Organizational Learning and Knowledge Management, pp. 21–41.
Bullinger, A.C., Rass, M., Adamczyk, S., Moeslein, K.M., Sohn, S., 2012. Open innovation in health care: analysis of an open health platform. Health Policy 105 (2–3), 165–175.
Caldwell, R., 2012. Systems thinking, organizational change and agency: a practice theory critique of Senge's learning organization. J. Chang. Manag. 12 (2), 145–164.
Chalofsky, N., Cavallaro, L., 2013. A good living versus a good life: meaning, purpose, and HRD. Adv. Dev. Hum. Resour. 15 (4), 331–340.
Christman, J., 2002. Social and Political Philosophy. Routledge, London.
Crowley, D., Heyer, P., 2011. Communication in History: Technology, Culture, Society, 6th ed. Allyn & Bacon, Boston, MA.
Daiberl, C.F., Oks, S.J., Roth, A., Möslein, K.M., Alter, S., 2019. Design principles for establishing a multi-sided open innovation platform: lessons learned from an action research study in the medical technology industry. Electron. Mark. 29 (4), 711–728.
De Reuver, M., Bouwman, H., Haaker, T., 2013. Business model roadmapping: a practical approach to come from an existing to a desired business model. Int. J. Innov. Manag. 17 (01), 1340006.
De Reuver, M., Sørensen, C., Basole, R.C., 2018. The digital platform: a research agenda. J. Inf. Technol. 33 (2), 124–135.
Eaton, B., Elaluf-Calderwood, S., Sørensen, C., Yoo, Y., 2015. Distributed tuning of boundary resources. MIS Q. 39 (1), 217–244.
Engestr€om, Y., Kerouac, H., 2007. From workplace learning to inter-organisational learning and back: the contribution of activity theory. J. Work. Learn. 19, 336–342.
Engeström, 2007. Enriching the theory of expansive learning: lessons from journeys toward coconfiguration. Mind Cult. Act. 14 (1-2), 23–39.
Frankl, V.E., 1946. Man's Search for Meaning. Washington Square Press, New York.
Garrety, Karin, McLoughlin, Ian, Wilson, Rob, Zelle, Gregor, Martin, Mike, 2014. National electronic health records and the digital disruption of moral orders. Soc. Sci. Med. 101, 70–77.
Gawer, A., Cusumano, M.A., 2002. Platform Leadership: How Intel, Microsoft, and Cisco Drive Industry Innovation. Harvard Business School Press, Boston.
Gorwa, R., 2019. What is platform governance? Inf. Commun. Soc. 22 (6), 854–871.
Halinen, A., Tornroos, J.-A., 2005. Using case methods in the study of contemporary business networks. J. Bus. Res. 58 (9), 1285–1297.
Hallerstede, S., 2013. Managing the Lifecycle of Open Innovation Platforms. Springer Gabler Wiesbaden.
Hallerstede, S., Leuschel, M., Plagge, D., 2013. Validation of formal models by refinement animation. Sci. Comput. Program. 78 (3), 272–292.
Hanelt, A., Bohnsack, R., Marz, D., Antunes Marante, C., 2021. A systematic review of the literature on digital transformation: insights and implications for strategy and organizational change. J. Manag. Stud. 58 (5), 1159–1197.
Hansen, J.Ø., Jensen, A., Nguyen, N., 2020. The responsible learning organization: can Senge (1990) teach organizations how to become responsible innovators?. In: The Learning Organization.
Hess, T., Matt, C., Benlian, A., Wiesböck, F., 2016. Options for formulating a digital transformation strategy. MIS Q. Exec. 15 (2), 123–139.
Holbrook, D., 1977. Politics and the need for meaning. In: Fitzgerald, R. (Ed.), Human needs and politics. Pergamon Press, Oxford, pp. 174–194.
Kenney, M., Zysman, J., 2016. The rise of the platform economy. Sci. Technol. 32 (3), 61–69.
Kiesling, L.L., 2016. Implications of smart grid innovation for organizational models in electricity distribution. In: Liu, C.-C. (Ed.), Wiley Handbook of Smart Grid Development. Wiley, Hoboken.
Koltko-Rivera, M.E., 2006. Rediscovering the later version of Maslow's hierarchy of needs: self-transcendence and opportunities for theory, research, and unification. Rev. Gen. Psychol. 10, 302–317.
Koskinen, K., Bonina, C., Eaton, B., 2019. Digital platforms in the global south: foundations and research agenda. In: Nielsen, P., Kimaro, H.C. (Eds.), Information and Communication Technologies for Development. Strengthening SouthernDriven Cooperation as a Catalyst for ICT4D. ICT4D 2019, IFIP Advances in Information and Communication Technology, 551. Springer, Cham.
Kuoppakangas, P., Kinder, T., Stenvall, J., Laitinen, I., Ruuskanen, O.P., Rannisto, P.H., 2019. Examining the Core Dilemmas Hindering Big Data-Related Transformations in Public-Sector Organisations.
Kuoppakangas, P., Lindfors, J., Stenwall, J., Kinder, T., Talonen, A., 2020. COVID-19 triggering homecare professionals' change of attitudes towards e-welfare. Finn. J. eHealth eWelfare 12 (3), 241–249.
Lenka, S., Parida, V., Wincent, J., 2017. Digitalization capabilities as enablers of value co-creation in servitizing firms. Psychol. Mark. 34 (1), 92–100.
Lepisto, D.A., Pratt, M.G., 2017. Meaningful work as realization and justification: toward a dual conceptualization. Organ. Psychol. Rev. 7 (2), 99–121.
Lips-Wiersma, M., Wright, S., 2012. Measuring the meaning of meaningful work: development and validation of the Comprehensive Meaningful Work Scale (CMWS). Group Org. Manag. 37 (5), 655–685.
Lolich, L., Riccò, I., Deusdad, B., Timonen, V., 2019. Embracing technology? Health and social care professionals' attitudes to the deployment of e-health initiatives in elder care services in Catalonia and Ireland. Technol. Forecast. Soc. Chang. 147 (C), 63–71.
Martela, F., Pessi, A.B., 2018. Significant work is about self-realization and broader purpose: defining the key dimensions of meaningful work. Front. Psychol. 9, 363.
McLeod, S., 2007. Maslow's hierarchy of needs. Simply Psychol. 1 (1-18).
Mettler, T., Pinto, R., 2018. Evolutionary paths and influencing factors towards digital maturity: an analysis of the status quo in Swiss hospitals. Technol. Forecast. Soc. Chang. 133, 104–117.
Ministry of Social Affairs and Health, 2020. Quality recommendation to guarantee a good quality of life and improved services for older persons 2020–2023. The aim is an age-friendly Finland. In: Ministry of Social Affairs and Health and Association of Finnish Local and Regional Authorities. Publications of the Ministry of Social Affairs and Health 2020, 37 [Accessed 08 October 2021]. https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/162595/STM_2020_37_J.pdf?sequence=1&isAllowed=y [Accessed 08 October 2021].
Nadkarni, S., Prügl, R., 2021. Digital transformation: a review, synthesis and opportunities for future research. Manag. Rev. Q. 71 (2), 233–341.
Norman, K.A., 2002. Differential effects of list strength on recollection and familiarity. J. Exp. Psychol. Learn. Mem. Cogn. 28, 1083–1094.

Osborne, S.P., 2018. From public service-dominant logic to public service logic: are public service organizations capable of co-production and value co-creation? Public Manag. Rev. 20 (2), 225–231.
Quirky, 2020. Accessed 27 May 2020 Available at. https://quirky.com/.
Ryan, R.M., Deci, E.L., 2000. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. Am. Psychol. 55 (1), 68.
Schiavone, F., Mancini, D., Leone, D., Lavorato, D., 2021. Digital business models and ridesharing for value co-creation in healthcare: a multi-stakeholder ecosystem analysis. Technol. Forecast. Soc. Chang. 166, 120647.
Sedera, D., Lokuge, S., Grover, V., Sarker, S., Sarker, S., 2016. Innovating with enterprise systems and digital platforms: a contingent resource-based theory view. Inf. Manag. 53 (3), 366–379.
Silverman, David, 2011. Qualitative Research, 3rd ed. Sage Publication Ltd, London.
Stenvall, J., Kinder, T., Kuoppakangas, P., Laitinen, I., 2018. Unlearning and public services—a case study with a Vygotskian approach. J. Adult Contin. Educ. 24 (2), 188–207.
Strauss, A., Corbin, J., 1998. Basics of Qualitative Research. Techniques and Procedures for Developing Grounded Theory, 2nd ed. Sage Publications, Thousand Oaks, CA.
Svahn, F., Lindgren, R., Mathiassen, L., 2015. Applying options thinking to shape generativity in digital innovation: an action research into connected cars. In: 49th Hawaii International Conference on System Science (HICSS 49), IEEE, pp. 4141–4150.
Talonen, A., Mähönen, J., Koskinen, L., Kuoppakangas, P., 2021. Analysis of consumers' negative perceptions of health tracking in insurance–a value sacrifice approach. J. Inf. Commun. Ethics Soc. 19 (4), 463–479.
Talonen, A., Koskinen, L., Voutilainen, R., Talonen, H., 2022. Adoption of incentive-based insurance applications: the perspective of psychological ownership. J. Financ. Serv. Mark. (published online first article).
The World Bank, 2019. World Health Organization Global Health Expenditure Database. The World Bank [Accessed 05 May 2020]. Available at: https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS.
Tilson, D., Lyytinen, K., Sorensen, C., 2010, January. Desperately seeking the infrastructure in IS research: conceptualization of" digital convergence" as co-evolution of social and technical infrastructures. In: 2010 43rd Hawaii International Conference on System Sciences. IEEE, pp. 1–10.
Tirronen, A., Kinder, T., Stenvall, J., 2021. Learning in Finnish social work practice and research. Br. J. Soc. Work 51 (7), 2760–2781.
Väestökatsaus, 2020. Väestökatsaus kuukausitiedot 4/2020 Tampere Finland. Accessed 4 June 2020 Available at: https://www.tampere.fi/tampereen-kaupunki/tietoa-tampereesta/tietonakoala/vaesto-ja-vaestonmuutokset.html.
Vygotsky, L.S., 1926. 1992. Educational Psychology. St Lucie Press, Boca Raton, FL.
Wolf, 2010. Meaning in Life and Why Does It Matter. Princeton University Press, New Jersey.
Wong, P.T., 2016. Chinese positive psychology revisited. International Journal of Existential Positive Psychology 6 (1), 1–7.
Wrzesniewski, A., McCauley, C., Rozin, P., Schwartz, B., 1997. Jobs, careers, and callings: People's relations to their work. J. Res. Pers. 31 (1), 21–33.
Yablonsky, S., 2018. A multidimensional framework for digital platform innovation and management: from business to technological platforms. Syst. Res. Behav. Sci. 35 (4), 485–501.
Yeoman, R., 2014. Conceptualising meaningful work as a fundamental human need. J. Bus. Ethics 125 (2), 235–251.
Yeoman, R., O'Hara, J., 2017. Meaningfulness and mutuality in organisation design. HR Mag. (November 29).
Yin, R.K., 2003. Case Study Research. Design and Methods, 8th ed. Sage Publications, Newbury Park, CA.
Zhao, Y., Canales, J.I., 2021. Never the twain shall meet? Knowledge strategies for digitalization in healthcare. Technol. Forecast. Soc. Chang. 170, 120923.

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