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Mahei Manhai Li
University of Kassel, mahei.li@uni-kassel.de

Christoph Peters
University of St. Gallen, christoph.peters@unisg.ch

Mathis Poser
University of Hamburg, poser@informatik.uni-hamburg.de

Karen Eilers
University of Kassel, karen.eilers@uni-kassel.de

Edona Elshan
Institute of Information Management, edona.elshan@unisg.ch

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Completed Research Paper

Mahei Manhai Li
University of Kassel
Kassel, Germany
mahei.li@uni-kassel.de

Christoph Peters
University of St.Gallen
St.Gallen, Switzerland
christoph.peters@unisg.ch

Mathis Poser
University of Hamburg
Hamburg, Germany
mathis.poser@uni-hamburg.de

Karen Eilers
University of Kassel
Kassel, Germany
karen.eilers@uni-kassel.de

Edona Elshan
University of St.Gallen
St.Gallen, Switzerland
edona.elshan@unisg.ch

Abstract

Recently, businesses are introducing low-code development platforms (LCDP) that enable employees with little to no development expertise to develop their own systems to improve their work. These so-called business unit developers (BUDs) possess necessary domain knowledge to understand how to use LCDPs to create useful (self-) services. Using job resource demand theory and the job crafting model, we conceptualize that BUDs use of LCDPs can be framed using the theoretical lens of job crafting. Job crafting stems from vocational psychology and provides well-researched positive consequences, such as wellbeing and meaningfulness. Thus, our research objective is to understand how BUDs can use LCDPs to job craft to gain access to positive job crafting consequences. We interviewed 17 experts across three organizations that employ an LDCP for chatbots. Our results suggest that job crafting is a suitable framework for understanding the effects of LCDP use.

Keywords: Job crafting, resource demand theory, low code development platform, LCDP, no-code, work system, work design, job roles

Introduction

Companies are under constant pressure to innovate, to build, and to establish competitive advantages. Seeking to optimize business processes and products, 80% of global companies across industries are searching for ways to utilize artificial intelligence (AI) (Ghosh et al. 2019). Powered by readily accessible and continuously advancing machine learning (ML) methods, transactional, analytical, and problem-solving tasks that were previously performed by humans can be increasingly automated by AI applications in various work contexts, such as logistics, customer service, and human resources (Murray et al. 2021). Thus, businesses leverage their data to automate processes and tasks to increase efficiency and productivity at the individual, departmental, and organizational levels (Brynjolfsson et al. 2018). Accordingly, the

potential for automation is high in work contexts with information-intensive and knowledge-intensive tasks (e.g., customer service, IT support, sales management) (Huang and Rust 2018, Levy 2018). However, AI is associated with fears of job replacement and substitution (Brock and Wangenheim 2019, Fleming 2019, Frank et al. 2019). The World Economic Forum (2020), for example, estimates that the next five years will see 85 million jobs displaced by automation while also generating 97 million new job profiles. Those revolve around a workforce that is willing to upskill (Brynjolfsson et al. 2018), which coincides with the current trend of only partial job automation (Levy 2018). Being able to integrate technologies, such as AI into work practices, employees need to be able to grasp and deploy them in useful work scenarios (Makarius et al. 2020). While a technology push does not necessarily lead to work improvements, a novel type of technology emerged in recent years that promises to encapsulate much of technological complexities into easily utilizable modules to create enterprise-ready services and to democratize IT for business units —so-called low code development platforms (LCDP) (Brinker, 2018).

While a new generation of tech-savvy, digitally native workers is emerging, who are already equipped with the necessary qualifications to be effective low-code developers, little is known about the effects of LCDP use on their work environment. We know that LCDPs allow faster, simpler, and cheaper development of low-code services by employees other than those in the IT department (Lethbridge 2021). LCDPs allow individuals with little to no prior software development experience to encapsulate technologies (e.g., AI) and quickly deploy suitable micro-services for their work environment (Bock and Frank 2021). We coin these users of LCDPs as business unit developers (BUDs) to indicate their expertise for a business work environment. Equipped with extensive domain knowledge, we argue that BUDs are suitable for using LCDPs for deploying or editing digital services (e.g., chatbot services). However, little is known about how BUDs are using LCDPs. We assume that LCDPs enable users to affect their work by deploying software systems that reduce their workload as means of automation (Staaby et al. 2021). In this research paper, we aim to explore how BUDs use LCDPs to improve their work environment.

A theoretical framework to potentially explain LCDP use is job crafting, which is based on the job resource demand theory (Lazazzara et al. 2020). Job crafting refers to activities of employees who voluntarily change their work environment for self-targeted benefits and long-lasting effects (Wrzesniewski and Dutton 2001). Job crafting has shown a multitude of positive consequences for job crafters, such as an increase in work motivation and organizational performance (Demerouti 2014, Lee et al. 2018), work engagement (Bakker et al. 2012, Chiu 2017), meaningfulness (Wrzesniewski et al. 2013), job satisfaction (Lazazzara et al. 2020), and wellbeing (Bruning and Campion 2018). In recent years the job crafting literature has begun to focus on IS-related job crafting phenomena. More specifically, scholars investigated employees' proactive implementation of changes to better adopt specific information systems (IS) as means to change work processes (Bruning and Campion 2018). These research endeavors have shown that the proactive use of a specific IS will allow job crafters to maintain high levels of work flexibility (Sturges 2012) or even lead to finding innovative ways of solving their work tasks (Mattarelli & Tagliaventi 2015). While recognizing the importance of information and communications technology (ICT), the lack of "specific technology-related [job] crafting forms" (Lazazzara et al. 2020, p. 6) is reflected in the small number of IS journal publications (see chapter on related work). Moreover, research has shown that technologies that have a high degree of reconfigurability or customization enable employees to craft their jobs (Xu et al. 2022). LCDPs appear to fulfill these requirements, as they allow BUDs to develop services voluntarily and change their work environment for their benefit, e.g., by creating chatbots to automate part of their work. Therefore, we argue that job crafting might explain part of how BUDs use LCDPs to affect their work environment. Since LCDPs, such as conversational AI platforms (CAIP), constitute a tool to deploy, customize, and reconfigure integrated chatbots, we chose to study three different cases using CAIPs, which enabled their business units to create chatbot-based services using an LCDP. As we aim to explore the relationship between the use of LCDPs and job crafting, we interviewed 17 experts who have experience with successful implementations of LCDPs that enable the creation of chatbots. Our results indicate that the phenomenon of using LCDPs can be explained via job crafting. To represent the unique quality of LCDPs to empower BUDs to change their work environment, our research question is as follows: *How does LCDP enable business unit developers to craft jobs?*

Theoretical Foundation: Job Crafting

There are two dominant streams of research on job crafting (Bruning and Campion 2018): a role-oriented perspective on job crafting (Wrzesniewski and Dutton 2001) and a resource-based perspective. The latter focuses on the crafting of either job demands or job resources (Tims and Bakker 2010). Both share a common definition of jobs: a job is composed of tasks grouped into a job title and assigned to individual employees (Hollenbeck et al. 1992).

The resource-based perspective is based on the Job Demands-Resources (JD-R) theory (Demerouti 2014), where a job is structured into job resources and job demands. The first one means having access to any resources, including operant resources (i.e., skill and knowledge), that enable employees to perform their job tasks. Job demands are physical, psychological, social, or organizational aspects of a job that employees are required to sustain to perform their job (Bakker et al. 2003, Demerouti et al. 2001). Job demands, therefore, lead to work exhaustion, and job resources can buffer the adverse effects of job demands, such as burnout, or predict positive work-related outcomes, such as client satisfaction or commitment (Bakker et al. 2005). Against this backdrop, job crafting is the willful act of employees to alter the tension between job demands and job resources. This paper refers to Zhang and Parker's (2019) wording of *approach crafting*, which subsumes forms of resource-altering crafting activities and *avoidance crafting* to include all forms of demands-altering activities.

The role-oriented perspective on job crafting construes employees as crafters of their jobs (Wrzesniewski and Dutton 2001) who can actively engage in shaping, adjusting, or redefining their job. Employees engage in job crafting along the following three dimensions: (1) task crafting, (2) cognitive crafting, and (3) relational crafting. Task-based crafting occurs when an individual's number, scope, or type of job task is altered (Wrzesniewski and Dutton 2001). Relational crafting occurs, when the number of job-related interactions with others change or if the quality of the interaction changes. Lastly, cognitive crafting occurs when employees change their understanding of their work, how they work, what it means, and the perspective on their work holistically (Wrzesniewski and Dutton 2001). Building on Zhang and Parker (2019) and Lazazzara et al. (2020), this paper distinguishes between the permutations of approach crafting and avoidance crafting. Approach crafting includes all forms of social or work expansions, whereas avoidance crafting includes work-role reduction (Bruning and Campion 2018). Job crafting is further split into task, relational, and cognitive crafting, which are later mapped onto the higher-order themes within our qualitative data structure.

Some criteria for job crafting are as follows (Bruning and Campion 2018): (1) Job crafters target themselves with the intention of self-benefit (Tims et al. 2012, Wrzesniewski and Dutton 2001). (2) Job crafting is a deliberate act that happens voluntarily. (3) Job crafting changes the tasks of standard job roles noticeably. (4) The changes are not temporary changes but last either permanently or semipermanently. (5) Job crafting happens within the context of work (Berg, Grant, and Johnson 2010a). The motivation for job crafting is often attributed to the following three motives: the need for control, the need for a positive self-image, and the need for social connection (Wrzesniewski and Dutton 2001).

Related Work

Job Crafting in IS

After conducting a systematic literature review (vom Brocke et al. 2015, Webster and Watson 2002) on job crafting in the IS literature, we identified ten relevant hits. Our search string included "job crafting" OR "job crafting model" OR "JR-D model" OR "JR-D theory" OR "job resource-demand model" OR "job resource-demand theory" in all relevant databases that include the basket of eight journals and AIS-affiliated conferences, which comprise HICSS, PACIS, ECIS, AMCIS, and ICIS. We focus on these databases because IS change and improve the way people work (Wang et al. 2020) and are therefore suitable to study new mechanisms to facilitate employees' job crafting. Based on the final set of papers, we conducted a forward and backward search and identified one more research-in-progress paper. We selected the relevant paper by a boundary criterion and included only those papers that address job crafting in their research focus. We set no limited time stamp to get a comprehensive overview of results in IS regarding job crafting and initiated the review by analyzing the title and abstract. If job crafting was tackled in the research focus, we

continued by analyzing the whole paper. Due to this review process, we started with 45 hits and selected eleven relevant research papers (see Table 1 for an overview).

Source	Hits	Relevant	Forward/ Backward Search
Conferences:			
European Conference on Information Systems (ECIS)	4	1	0
Hawaii International Conference on System Science (HICSS)	2	1	0
Pacific Asia Conference on Information Systems (PACIS)	6	4	0
Americas Conference on Information Systems (AMCIS)	2	2	0
International Conference on Information Systems (ICIS)	2	0	1
Australasian Conference on Information Systems (ACIS)	0	0	0
Senior Scholar' Basket of Eight:			
Journal of Strategic Information Systems	2	0	0
Management Information Systems Quarterly	0	0	0
Journal of the Association for Information Systems	14	1	0
Journal of Information Technology	0	0	0
European Journal of Information Systems	0	0	0
Information Systems Journal	1	1	0
Journal of Management Information Systems	0	0	0
Information Systems Research	12	0	0
	45	**10**	**1**
Table 1. Literature Review Overview			

Most of the publications dealing with job crafting in the IS context are conference papers. Only two journal papers have addressed the topic so far. Almost half of the publications are research-in-progress papers. Furthermore, job crafting has only been researched in the context of IS since 2014, and almost 40 % of those publications have been published in the last two years, indicating an increasing relevance of job crafting through upcoming technologies. Several publications investigate the positive effect of new IS and technologies on employee job crafting. For example, Kehr et al. (2013) postulate that IS can support employees to do job crafting and started to develop an evaluation system for job crafting IS in their research-in-progress paper (Kehr et al. 2014). Xu et al. (2018) identified technological characteristics such as technological reconfigurability and system integration as important factors influencing employees' motivational states, and these, in turn, influence collaborative job crafting. Furthermore, "bring your own device" (Wang et al. 2018), ICT (Tarafdar and Saunders 2021), and employee experience management systems (Abhari et al. 2021) are postulated to have an impact on job crafting. Other scholars identified outcomes in contexts of IS with job crafting. For example, Chiu (2017) posits that job crafting supports IT professionals. Berg et al. (2010) found out that employees use forms of job crafting to deal with unanswered calls. Job crafting should also be integrated into the automation of routine activities to address the work meaningfulness (Staaby et al. 2021). In addition, there are also positive effects of job crafting on employees, such as an increase in job resources, level of match between resources and demands, requirements to achieve wellbeing (Tarafdar and Saunders 2021), motivation (Xu et al. 2018), commitment to the organization and intention to comply (Chiu and Tan 2020), engagement (Abhari et al. 2021, Chiu 2017), and lower turnover intention (Chiu 2017). Effects of ICT use on job crafting have been limited, with no insights of LCDP influences on job crafting.

The limited amount of scientific knowledge on job crafting in IS is not in proportion to the potential of new technologies for job crafting. In the publications, often only single aspects of the three job crafting forms have been addressed. Furthermore, most of the studies did not distinguish between individual or collaborative job crafting. Along with that, there is a lack of comprehensive results on job crafting that reflect generalizability for other new technologies, such as chatbots basedon on LCDPs. We assume that

LCDPs has the potential to enable employees across an organizational business unit to craft their own job. The technology-specific characteristics of LCDPs, may lead to new mechanisms or forms of job crafting.

Low-Code Development Platforms

Low code development platforms can be defined as a set of tools for both programmers with prior knowledge and those with no prior experience with creating applications (Adrian et al. 2020, Bock and Frank 2021, Kletti 2021). In this context, it should be highlighted that the term "low" does not refer to the quality of the product; rather, it refers to the lack of effort required to develop, for instance, tools to enable workflow automation (Kroder 2021). One main characteristic of LCDPs is the graphical user interface, which allows the developers to generate artifacts simply by means of drag-and-drop (Sahay et al. 2020). Within companies, these low-code platforms are part of a larger trend of technology democratization (Brinker 2018), referring to any undertaking that traditionally required coding but can now be accomplished by a business user. Typically, these LCDPs enable BUDs to swiftly build and deploy a wide range of IT artifacts without the need for manual coding as well as to expend as little time as possible on installation, configuration, training, and implementation of the developed artifacts (Waszkowski 2019). Businesses are leveraging LCDP's ease of use to enable their functional units to create their own service. This reduces risks by cutting out the middleman (e.g., the IT department) and providing easy-to-use access to AI-based technologies. Yet, LCDP's research is still in its early stages, which is why there have only been a few studies in the research area (Alamin et al. 2021, Maruping and Matook 2020). In this domain, end-user computing approaches efficiently dissolve the conventional barriers between professional developers and BUDs. As a result, organizational decision-making processes, collaboration patterns, and responsibilities related to the design and usage of IS are likely to be impacted. While these issues were addressed in early end-user computing research (Amoroso DL 1988), the digitization of work settings and corporate representatives' digital literacy has evolved considerably since then. To our knowledge, no prior research has been conducted on the extent to which job crafting is considered in the construction of IT artifacts utilizing LCDPs.

Research Design

To address the research question, we applied a qualitative research design and adopted an interpretive approach to studying the socially constructed experiences of experts on LCDP. Following the notion of "knowledgeable agents" by Gioia (2013), we captured experts' thoughts, experiences, and behaviors, allowing the discovery of novel concepts (Gioia et al. 2013, Gioia 2021).

Interviewee	Job Roles	Domain	Duration (∅: 53:50)
I1	Marketing Manager	Insurance (InsurCorp)	Focus group: 34:26
I2	Corporate IT Analyst		
I3	Marketeer		Focus group: 01:02:19
I4	IT Governance		
I5	Product Owner		
I6	Innovation Manager		
I7	Marketing		Focus group: 01:33:47
I8	Corporate IT		
I9	Lawyer		
I10	Lawyer		
I11	Product Owner	Manufacturing (ManuCorp)	30:06
I12	Product Owner		01:30:26
I13	Product Development	Aerospace (AeroCorp)	38:07
I14	Customer Service		01:20:41
I15	Technology Market Analyst	Market Research	47:12
I16	Senior Research Analyst		33:06
I17	Key Account Manager	LCDP provider (LCDPcorp)	26:02
Table 2. Interviewed experts and industry domain of companies			

Data collection: For the selection of experts, we used the criterion sampling method to ensure that interviewees were involved in at least one LCDP implementation project and had at least six years of work experience. Therefore, we preselected companies that were familiar with one leading LCDP that provides clients with a cloud-based conversational AI platform facilitating the development and integration of chatbots into existing technology landscapes. We chose the platform provider because of its current market share dominance (top 5 in class). Thereby, influences due to the diversity of functionalities of different LCDPs on the exploration of the phenomenon under investigation were reduced. Consequently, three companies operating, investigating, or supplying this LCDP from different industries with 4–25k employees were identified. We collected data until the saturation point was reached, i.e., no additional novel insights were mentioned during the interviews (Saunders et al. 2018). Overall, the sampling approach resulted in the selection of 17 experts with different professional backgrounds and positions (see Table 2). Therefore, multiple perspectives on the phenomenon under investigation could be incorporated.

To elicit a rich amount of qualitative data, we utilized two established methods: semi-structured interviews (Myers and Newman 2007) and focus groups (Stewart et al. 2007). For both methods, an interview guide was created with open-ended questions and the following main topics: (1) job responsibilities, (2) motivation for utilizing conversational AI platforms, (3) requirements for conversational AI platforms, and (4) achievements by using conversational AI platforms. Semi-structured interviews were conducted to explore the experiences of individuals in depth. The focus groups were used to gain further insights by stimulating a discussion between experts from different business units. Based on audio recordings, verbatim transcripts were prepared for the subsequent qualitative analysis.

Figure 1. Data structure according to Gioia (2013)
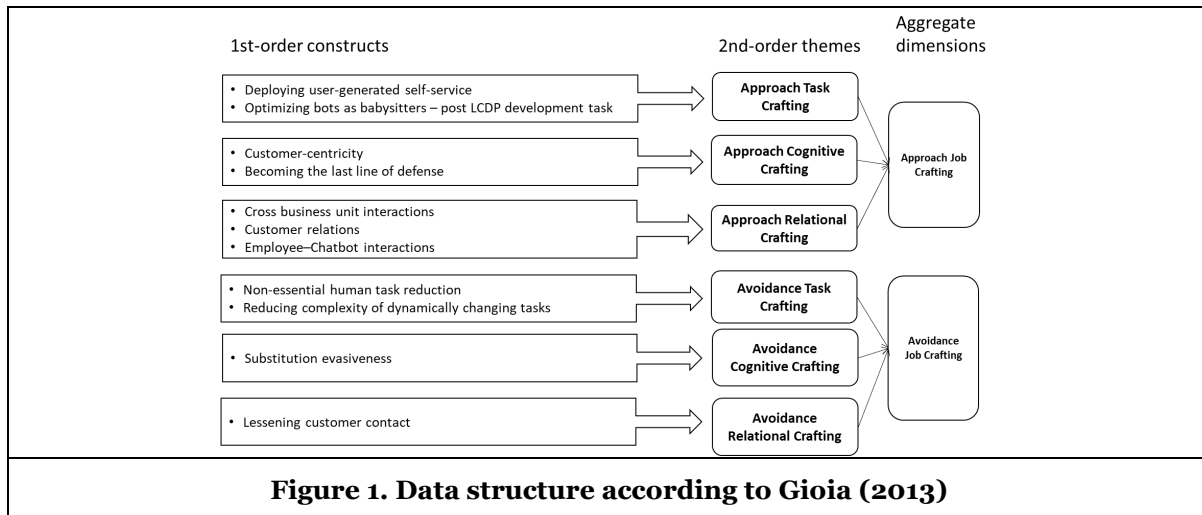
Data analysis: As the phases of interviewing and analyzing are strongly intertwined (Langley 1999, Locke and Golden-Biddle 1997), we performed a qualitative analysis of transcripts and addressed the dimensions of *credibility*, *dependability, reliability*, and *transferability* to ensure rigor (Merriam and Grenier 2019). The *credibility* in terms of the agreement of our results with reality was ensured by the criterion-guided selection of interviewed experts who are knowledgeable agents in their work environment. To achieve *dependability* and *reliability*, two coders initiated the coding process independently. This coding process comprised multiple steps. Following Strauss and Corbin (1998), we utilized computer-aided (Atlas.TI) open coding to initially code segments in a first iteration while trying to remain faithful to the words used by each informant (Gioia et al. 2013). These coding results were critically discussed until first-order codes were sufficiently reviewed before starting the second iteration and repeated after each interview coding session so that all coders could ensure that first-order codes were on comparable levels of abstraction and reflected the experience of each expert. A high degree of concept saturation emerged after analyzing I16. Analyzing the generated categories, themes emerged, which resemble the concepts of job crafting concepts. After deliberation of two more hermeneutic circles consulting with the coders, we decided to apply job crafting concepts as second-order themes. Thus, we switched to a deductive mapping approach, based on the job crafting forms that were used to supplement this coding step (Gioia 2021). The second-order themes were mapped to first-order concepts, which thoroughly describe the phenomenon. Besides involving two independent coders, we applied an ethnography research approach (Morgan 1983) during the discussion of first-order themes and second-order themes to increase the validity of the results. More specifically, we

were adamant about having at least one researcher always take on the role of a devil's advocate to critically reflect interpretations that seemed too naive. While purists of interpretivism would argue for the idiosyncrasy of qualitative research and against the *transferability* of qualitative research, we agree with (Gioia et al. 2013) that qualitative, inductive research can produce structurally transferable insights. This was apparent due to the emergent coding of theory-driven second-order themes across all three organizational contexts. Figure 1 shows the resulting data structure following Gioia et al. (2013). Due to brevity, the first-order constructs and their relationships will be presented in the following results section.

Results

As a result of our data analysis, we identified how BUDs use LCDPs, resulting in six job crafting forms. We first present the form of job crafting by using LCDPs individually and extend them with quotes from our interviews (see also Figure 1). We continue with a short discussion based on existing job crafting literature, argue which of our job crafting forms are specific to our context and thus LCDP-enabled, and conclude each subsection with a proposition. In six crafting forms, we discuss reported consequences of job crafting and conclude with a short overview of our results, as illustrated in Figure 2.

As a first step, we verified whether our cases are suitable for studying LCDP phenomena. Several informants confirmed case suitability: The project leads confirmed that the promised chatbot-based self-services have to be created by employees within the domain-relevant business unit. Thus, an "*important part was the topic of low-code and ease of use*" […], since they "*realized that it was crucial that business units are in a position to train their bots by themselves so that the business unit side knows how to extend* [their services]" **(I16)**. This was confirmed by the other market researchers and the platform account manager, or as a bot product owner put it when speaking about critical success factors of LCDPs, "*they would do it on the side. […] Most of the time they [BUDs] don't have any or little software development experience but are experts in their field*" **(I12)**.

Thus, based on our interviews, it has become apparent that the task of employing chatbots within an organization does not stop with its successful deployment. With the introduction of the initial chatbot platform, the interviewees all agreed that their initial expectations were too simplistic. They gradually realized that chatbots require constant attention, or else risk that each chatbot can fall into obscurity relatively quickly.

Approach: Task Crafting

Deploying user-generated self-services: Approach crafting was the most prevalent job crafting-related category across all interviews. Furthermore, experts across all three cases reported that the LCDP enables new tasks. While fixed responsibilities for dialog design, automation development, and complex content nodes are the result of top-down job designs, "*development of simple tasks remains within the ability of the business units*" **(I17)**. Some functionalities of the bots were to "*[give] our employees the necessary information that will help them serve the guest as quickly as possible*" **(I3)**, which was based on previous simple system-side lookups. The most obvious task was the option to develop chatbots using the LCDP, regardless of previous software development skills and knowledge. BUDs are able to create a bot that can interact with a customer to improve the original work of a BUD. More specifically, the user-generated (UG) bots were able to provide information that improve subsequent customer interactions for BUDs or bots alike. This, in turn, elevates service quality from both a customer and an employee perspective.

Optimizing bots as babysitters—post LCDP development task: One notable approach task crafting phenomenon emerged after an initial development by BUDs using the LCDP. Many employees voluntarily started to keep an eye out for their own bots, previously developed using the LCDP. *"What we have also seen is that for all our bots we also need what we call babysitters. It's not useful to simply create a bot and leave it be. Rather, you need to constantly optimize it, and our bots have great babysitters! The people who made the bots and engaged always make sure [their bot] gets better and better. Sometimes it's a phrasing that needs to be adjusted, sometimes it's a specific wording. Well, it's usually the small things but things that could disrupt the conversational flow quite strongly. That's why we are happy that our*

*own people can do it by themselves. I mean, there are companies that just let someone develop the bot. They won't be especially happy with it—that's what I think." (***I2***).*

Our results mostly coincide with previous work on approach task crafting, which includes adding tasks or changing tasks and gaining new skills (Berg, Wrzesniewski, and Dutton 2010, Wrzesniewski and Dutton 2001). Some authors use domain-specific terms (Lazazzara et al. 2020), such as Fuller and Unwin (2017), by shifting their tasks into the healthcare domain to also entertain their customers, as *caring moves*. Similarly, we include two LCDP-specific task crafting forms: *deploying UG self-services* and post *LCDP development sitting*, which differentiates between knowing the LCDP development (Bock and Frank 2021) and the often overseen task of continuously editing and caring for the developed system. Interestingly, in LCDPs, the development of chatbots is somewhat comparable to the task crafting of work organization, which is a form of reorganizing the work system, such as task prioritization (Cohen 2013). Arguably, the development task of self-services, such as chatbots, is comparable to task prioritization because certain tasks were outsourced to a chatbot. This demonstrates the uniqueness of LCDP-enabled job crafting. Based on this, we establish the following proposition *(P1a): LCDP use influences approach task crafting positively.*

Approach: Cognitive Crafting

Customer-centricity: Our preliminary results also suggest that approach crafting has been a prevalent phenomenon among BUDs, where their relationship towards their work changes, and their perspective on their work changes holistically (Bruning and Campion 2018, Lazazzara et al. 2020). The BUDs of InsurCorp started to rethink their role as legal advisors and began to realize their role within the company to provide customer-centered service. As legal BUD puts it, *"As a lawyer, you normally are not really focused on the customer or have customer-centricity. You know your law, and you know how to handle that. But you don't even know how to make it accessible to the people and how to make it understood by everyone. And so, I think for me and also all the other lawyers, it was really interesting to think from a totally different point of view and have a totally different point of view on problems, so we always look for the problems or look at the problems from the legal perspective. And not every problem is a legal problem. And maybe it's totally different from what a customer wants to do there. And it has nothing to do with all that legal stuff. And it's not interesting for the user. So yes, always reflect on your way of thinking. And it's a process of learning every day and of course, every project was different. People open up your mind more and more, and you learn and learn and that's a good thing* **(I9)**. As a BUD from AeroCorp puts it, *"shouldn't I rather look at where this channel is best suited? Where can I improve the life of the customer and afford to do it? That's the learning that we had. Sure, we could do FAQs, but that's not going to inspire anyone!"* **(I14)**. Frontline workers want "*to identify the customer earlier and want to know what they need and which situation and context they are currently in*" **(I1)**.

Becoming the last line of defense: The LCDP also seems to have a profound impact on BUDs in their role as customer support agents. At AeroCorp, the employees used to have a use-case-driven perspective on the technology, looking out for scenarios. However, they have recently switched to a channel-driven perspective with the goal to become the last line of defense. "*What has improved in the last few years is that it is less about a use-case logic but a channel logic—what's the best way to appeal to the customer, let's say, per channel. [...] We are looking at the right places, thinking about what we can do so that the customer doesn't even have to call us or contact us. [...] When the customer calls us, wow -can we look at it from the last line of defense perspective? Before we route them to our employees, how can we funnel him [the customer] into a situation where they provide all the necessary information that is needed so there is no need for speaking to an employee and simultaneously provide the information to our employees*" [in case they happen to breach the bot line of defense] *"so that the bots can "help them [BUDs] serve the guest [meaning: customer] as fast as possible?",* **(I6).** This illustrates how the perceived role of customer support changes dramatically from their own point of view, and the LCDP appears to be the enabling technology to realize the said vision.

Typically, cognitive approach crafting addresses the reframing of work as a *meaningful whole* instead of a set of separate tasks (Berg, Wrzesniewski, and Dutton 2010) by focusing on the life of *other people* or the *organizational success* (Piekkari and Annina 2015). This is done by *reframing the purpose of their job* (Batova 2018) and forging a *new identity* that might appear more socially accepted (Janssen M. et al. 2016) or enhance their esteem (Fuller and Unwin 2017). Reframing coincides much with our codes on *customer-*

centricity, which allows the crafter to see things from a different perspective, realizing the value of their work from a customer-centric viewpoint, providing novelty and delight. More interestingly, the *last line of defense* viewpoint is a very pro-technology one and might belong to the pro-automation point of view. During discussions, the authors were taken aback by the extreme viewpoint of otherwise conservative people regarding anything that even remotely alludes to the possibility of job replacements. Becoming the last bastion holding back the onslaught of customers, with chatbots as the first line of pawns to lessen the blow is very vivid imagery to reframe the job as a unit that consists of both LCDP-enabled chatbots and frontline employees. The findings from the interviews suggest that *(P1b) LCDP use influences approach cognitive crafting positively*.

Approach: Relational Crafting

Cross business unit interactions: BUDs mention that they enjoyed working with different business units on creating some of the more complex chatbots. Especially the legal department enjoys the horizon-broadening interactions with both the customer agents and IT specialists. One lawyer stated, "*it was really, really exciting to do a totally new thing with those topics, and we had colleagues from the legal department, we had colleagues from marketing, we had colleagues from the IT governance [...] and we all worked together. [...] It was the nicest thing to see how lawyers and the IT guy can understand more and more of what the other one is talking about because it's normal that everyone is talking in their own words. It was really great to see [...] those different people."* **(I9)**. While this form of relational crafting is arguable a collaborative job crafting form, it represents a crafting impact of LCDPs on inter-employee interactions.

Customer relations: One form of how BUDs change their social relations is by enriching their customer-facing interactions. The chatbots helped them to "*get a picture of the mood every day, why the customers are calling, and how they are feeling"*[...] and use the information *"to give the customer the feeling that I can help them quickly and know why they are calling and their situation: Oh, I know now, you're calling or I assume you're calling about flight cancellations"* **(I1).** This form of relational crafting can create a more empathic interaction and be perceived as "being heard" by the support agent, which is all in part due to relational crafting.

Employee–Chatbot interactions: Implied by the BUDs, developing and editing a chatbot requires testing and interacting with chatbots. BUDs not only change customer–chatbot interactions during the continuous improvement of their chatbots but also create employee–chatbot interactions by creating them in the first place.

In addition to the ability to change work relationships (Berg, Wrzesniewski, and Dutton 2010) and add new relationships (Batova 2018), seeking peer support or being appreciated (Grant-Vallone and Ensher 2017, Lyons 2008, Piekkari and Annina 2015), meaning (Singh and Singh 2016) or creating job-related networks (Meged 2017) coincide with our insights into *cross-business unit interactions*. However, LCDP-enabled employee–chatbot interactions are a form of deliberate relational crafting by employees. This means that the BUD has deliberately crafted or adapted how other customers would interact with their chatbot. Depending on the interaction design, some chatbots can enrich employee–customer relations by providing useful insights. Thus, we argue both forms are a special form of relational crafting only possible for LCDP-developed systems that act with a sense of agency. Based on these insights we assume that *(P1c) LCDP use influences approach relational crafting positively*.

Avoidance: Task Crafting

Nonessential human task reduction: One very common form of avoidance task crafting was the realization of the possibility to reduce the number of cumbersome tasks. Across all interviews (I1–I10), the potential of applying bots to reduce the number of simple, repetitive tasks that often no one wanted to do was mentioned. "*We realized very quickly within the organization that there have been requests by other [business units regarding our platform], saying, 'what can we do to use that', and, 'that's super cool, we don't even have to do the work anymore'"* **(I1).** Typically, these are tasks that were important but did not gain anything by being done by a person. For example, *"providing information at this point [via a conversational system] helps us to remove waste. In the USA, for example, we have to provide flight status information. In the past, this was done once an hour or once every two hours, where this employee would*

sit down and generate an announcement for all flights bound for the USA manually". […] **(I1)**. Another avoidable task was *"to identify the customer. It doesn't matter whether it's done by an agent or by a robot"*, **(I5)** and *"employees have to record payment information, but that has absolutely no added value"* **(I2)**, which was why the tasks could be done beforehand.

Reducing complexity of dynamically changing tasks: One demanding task for AeroCorp service agents was always being aware and providing information on all the entry requirements for international travel. This was especially demanding due to the frequently changing regulations because of COVID policies. "*It began by realizing during the crisis [Covid] that we needed to change options more frequently and adapt announcements. […] This would otherwise have to be done by the service agents, who would get lost within the system [internal Aerospace contact center system]. **(I14)***". Removing demanding tasks for agents is a common form of avoidance task crafting resulting from LCDP.

When individuals decide to not do certain tasks or activities by reducing their numbers, requirements, or effort, they engage in avoidance crafting (Bruning and Campion 2018, Sturges 2012), which can be described as *reducing workload*, for example, by delegating tasks (Gascoigne and Kelliher 2018). They can simply refuse unwanted tasks and requests (Kira et al. 2012). The first form of task reduction is a deliberate act that focuses on nonessential tasks, which is in line with Singh and Singh (2016) terminology of noncritical tasks in addition to reducing task numbers or volume to reduce *resource constraints* (Lazazzara et al. 2020, Singh and Singh 2016). The second form of reducing the complexity of dynamic tasks is a special form of a task that can be outsourced: Providing information on exit and entry regulation for flights is critical since it has been done due to regulatory reasons, but effort expenditures are deemed as too high to keep track of all the dynamically changing information. This task was too demanding and thus target of avoidance task crafting. Here, no LCDP-exclusive crafting forms were identified. Still, as our results indicate, (*P2a) LCDP use influences avoidance task crafting positively.*

Avoidance: Cognitive Crafting

Substitution evasiveness: While we have observed a shift to become the last line of defense as a form of approach cognitive crafting, we also observed its potential for conflict within the workforce. As a marketing manager points out, *"how do we convince the agents that their jobs will not be completely replaced, but how can we say, 'tell us what's the most annoying thing about your work and we'll try to build something that makes your life easier'"* **(I1)**. The role as an advocate of LCDPs and the role as a job crafter seem to be closely related. Naysayers were frowned upon and "headwind was a no-go" […] and when asked about the fears associated with being replaced, one PO countered "*that it is actually a good thing that this topic is talked about. Our union representatives are always involved"* **(I12)**. The interviewees acknowledge the automation potential and the possibility to reduce agent loads but refrained from mentioning the substitution possibility. The BUDs actively avoid any negative associations with the LCDP as if it was their job to only focus on its possibilities. We view this substitution evasiveness as a form of avoidance cognitive crafting that is used to champion job crafting activities and benefits.

Traditionally, avoidance cognitive crafting is a form where workers *accept their situation* as given (van Wingerden et al. 2013). Contrary to an approach to cognitive crafting that can emphasize the positive qualities surrounding one's work (Piekkari and Annina 2015), a special form of avoidance crafting is *withdrawal crafting (Vuori et al. 2012)*, which means withdrawing from a person or situation either physically or mentally (Bruning and Campion 2018). In our case, we argue that the avoidance is also due to the stigma that is associated with the AI-based technology, in our case the LCDP, and its negative media coverage as an overbearing job replacement threat. Hence, employees withdrawing from negatively associated threats of automation constitutes a different form of technology-focused avoidance crafting. Overall, we suggest that (*P2b) LCDP use influences avoidance cognitive crafting positively.*

Avoidance: Relational Crafting

Lessening customer contact: One form of avoidance relational crafting is to change the number of interactions within a work-related social network. In our case, the development of chatbots ideally leads to

a reduction of interaction time for the support agents, which was confirmed across all interviewees. If BUDs source tasks to chatbots, it should reduce the time they have to interact with the customer. The most common form of avoidance relational crafting is decreasing the number of interactions with managers to gain more time for tasks (Rafaeli 1989), which coincides with reducing the number of customer interactions job crafting. Hence, we suggest that (*P2c) LCDP use influences avoidance relational crafting positively*.

Job Crafting Consequences

The literature on job crafting has primarily focused on the consequence of job crafting (Janssen M. et al. 2016, Tims et al. 2012, Tims and Bakker 2010, Wrzesniewski and Dutton 2001), while IT-enabled job crafting is concerned with the original motivation of organizations to implement LCDPs to achieve organizational benefits. Within our data, the informants were very much aware of organizational benefits, which were the result of LCDP use. Thus, in addition to the previously mentioned positive experiences, we also include organizational benefits in the job crafting consequences. As Figure 2 depicts, we propose an LCDP-enabled job crafting model that includes the job crafting forms that emerged from our data set. In summary, LCPD use is characterized by the voluntary use of BUDs with clear self-targeted, long-term benefits that affect different job crafting forms and result in the depicted job crafting consequences.

In summary, our data analysis resulted in eleven forms of job crafting, all assigned to one of six job crafting forms that were derived from the highest hierarchical job crafting levels of approach crafting and avoidance crafting (Lazazzara et al. 2020, Zhang and Parker 2019) of which five have been identified as LCDP-enabled forms of job crafting. They are strongly dependent on the LCDP technology and thus provide insights into a different form of ICT-enabled job crafting. Our results address the call of Lazazzara et al. (2020) to study ICT-specific job crafting forms and contribute to the current literature on the only theoretical body of knowledge on ICT-enabled job crafting theory (Tarafdar and Saunders 2021), as far as we are aware of.

BUDs' Positive Experiences

On several occasions, the interviewees confirmed that some BUDs were intrinsically motivated, realized the benefits for themselves, and used the LCDP voluntarily to create long-lasting effects on their work, which shows that we were dealing with a job crafting phenomenon. Prestige or esteem, job satisfaction, and meaningfulness are widely researched positive experiences as a consequence of job crafting (Canonico stampa 2018, Fuller and Unwin 2017, Kossek et al. 2016, Lazazzara et al. 2020, Meged 2017). Our interviews also showed indications of their effects based on the LCDP use.

Prestige: BUDs realize the benefits of LCDP use as a self-image projection: *"For many people, it's still an image thing—look at the cool things we can do"* (I5). They also showcase their ability to other peers or superiors, as indicated by bragging behaviors during the interview: *"I've already had inquiries from HR, Sales, and the IT helpdesk. They say we want exactly what you have [using a chatbot platform]"* (I1). The topic of *"bots, chatbots, especially automation in the last years have gotten big, and you naturally hear of it at any corner, not just within the company but outside in the media as well"* **(I12)**. Creating a positive self-image coincides with the identified drivers for job crafting (Singh and Singh 2016, Sturges 2012).

Meaningfulness: While psychological and organizational science already investigated the positive effect of job crafting on meaningfulness (Lazazza 2020), Staaby et al. (2021, p.163) found out that *"neither of the companies did explicitly start their automation journey with the goal of creating more meaningful work"*. Our result concerning relational crafting suggests that BUDs also perceive a shift in their job meaningfulness. This coincides with the results of jobs influencing the work meaningfulness (Meged 2017, Vuori et al. 2012, Wrzesniewski et al. 2013).

Satisfaction: In addition to prior research, several informants conveyed their general increase in job satisfaction after engaging with the LCDP to develop their chatbots, as one informant puts it: *"even in our international locations our biggest fans were those that worked with our legal area and why did they find it so great? It is a different task than just sitting there and answering calls – [hence] a better day"* **(I4)**

Wellbeing: Working with LCDPs can lead to greater wellbeing: *"it does have a certain happiness factor"* (I7). Due to the redesign of tasks regarding one's belongings and interests, employees suggest higher general wellbeing. Previous research has also shown that ICT-enabled job crafting can lead to occupational wellbeing (Tarafdar and Saunders 2021). While no direct quotes specifically state wellbeing as a

consequence, the literature is quite strong on job crafting's effects on wellbeing (Bakker and Demerouti 2014, Cooper 2014, Piekkari and Annina 2015).

Organizational Benefits

Operational efficiency: The LCDP promises to provide agents that can help reduce the workload of its employees and create business-relevant results. Within one context, "*the bot saves time for clerks and that's that […]. Currently, that bot has 500 visits per day, and we can be very precise about the state of the telephone [KPIs]. Now, we only receive 82.3 % of calls that people have to deal with. […] The bot took 1 minute, and a typical customer interaction takes 2.5 to 3 minutes. You can basically get an idea of the time-saving potential and that a clerk can be relieved from simple [tasks]. In the future, we aim to introduce targeted bot-based task routings to employees [for better service experience]*" **(I5)**.

Service quality: The deployment of LCDP-based chatbots also leads to more informed customer interactions if the bot was placed right before the employee–customer interaction. Not only the employee but also the customer is better informed. As the BUD lawyer put it, "*when you come from having experience [and interacted] with the chatbot, you already come pre-qualified. […] This kind of answer informs the conversations that enable very informed [customer] calls. The experience with the service is much better for both sides—the customer and the agent, who is answering the call*" **(I3)**.

Successful LCDP implementation: Another indicator of LCDP benefits was the rising number of bot-based conversations. They "*already have 250–260 percent increase of growth compared to last year, and this year it will foreseeably be 600 to 700% percent compared to last year.*" **(I2)**.

Discussion

Figure 2 summarizes our exploratory results, which suggests that the use of LCDPs enables different forms of job crafting. In our initial results, we have shown that LCDP use can have positive effects on approach crafting and avoidance crafting. P1a–P1c show different forms of approach task, approach cognitive and approach relational crafting, while P2a-P2c establish the relationship between LCDP with different avoidance task, avoidance cognitive and avoidance relational crafting. The current job crafting literature has focused on individual job crafting consequences, which were summarized under positive experiences (Lazazzara et al. 2020). Our interviewees have stressed the organizational benefits of employing LCDPs. We argue that this might be particularly important to ICT-enabled job crafting: Within our LCDP context, business developers use LCDPs to improve their existing work environment (Lethbridge 2021), thus, LCDP-based technology is benchmarked with organizational benefits (Staaby et al. 2021). We thus argue ICT-enabled job crafting forms should explore both positive experiences and organizational benefits to better assess the effects of LCDP-enabled job crafting. These implications can potentially shed more light on LCDP project success (Bock and Frank 2021) and are in line with the call to study ICT use from a work design perspective (Wang et al. 2020).
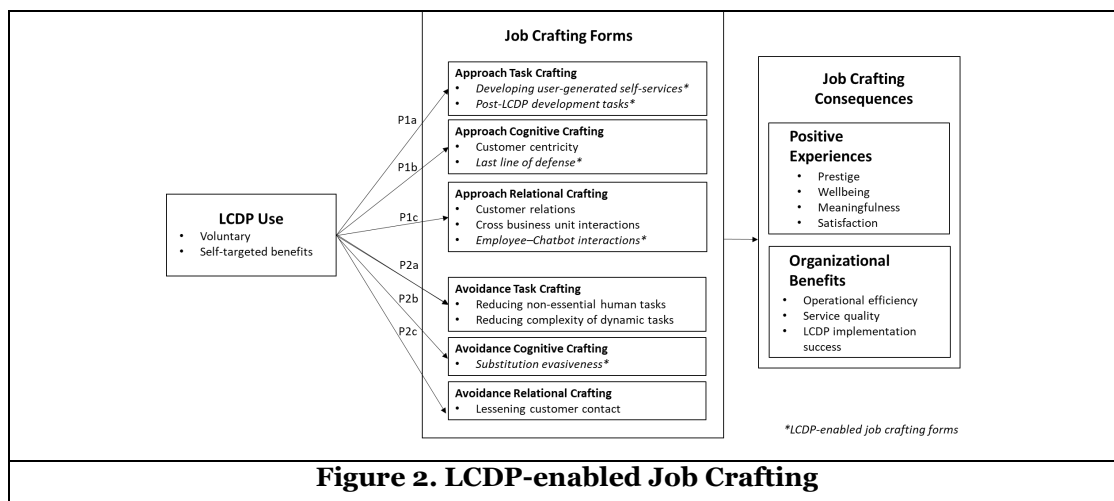

Figure 2. LCDP-enabled Job Crafting

Our results also provide insights into technology-specific job crafting forms (Lazazzara et al. 2020). This paper analyzes LCDPs to create chatbots. Recognizing that BUDs provide chatbots as self services to their customers as a form of task job crafting, its development is directly related to the nature of the LCDP in question. If we view LCDPs as digital objects (Runde and Faulkner 2019), we argue that there is a relationship between system functionalities (to develop chatbots) and its social positioning (as means for job crafting). Thus, we argue that the presented job crafting form appears to either inherit characteristics or is embedded in its use context. This opens new questions regarding the relationship between the nature of ICT and ICT-enabled job crafting forms. The agency characteristic of our LCDP appears to be a ICT-specific job crafting characteristic: BUDs use the LCDP to create chatbots, whose *agency* stands for a last line of defense (cognitive crafting) and changes the newly augmented agent-customer-chatbot interaction (relational crafting). Similarly, the avoidance cognitive crafting form of evading the AI substitution topic altogether is related to the social positioning of the technology. We argue that AI-chatbots are feared to become associated with other existing debates around AI-substitution. These inherited digital object traits influence avoidance cognitive crafting. In summary, we a) argue that our results show a general relationship between LCDP-enabled job crafting and job crafting consequences (Lazazzara et al. 2020) and b) discuss that LCDP-enabled job crafting has a relationship with the job crafting enabling digital object (Runde and Faulkner 2019).

Also, recent voices have become more critical of LCDP, arguing that they do not constitute a novel class of systems (Cabot 2020). However, we believe that our insights into how LCDPs can change work as a bottom-up approach provides future researchers with avenues to study the uniqueness of LCDPs, as demonstreated with its effects on job crafting.

Contribution

This paper contributes to the development of a Type 2 theory (Gregor 2006) of ICT-enabled job crafting (Tarafdar and Saunders 2021), which explains how business unit developers can use LCDPs to craft their jobs and leverage positive job crafting consequences. We explain how BUDs can use LCDPs to (1) engage in approach job crafting, and (2) engage in avoidance job crafting to reduce job demands or increase job resources. Thus, we contribute to two bodies of knowledge. First, this research expands upon the current knowledge on citizen developers' use of LCDPs (Bock and Frank 2021). To the best of our knowledge, there has been no prior research that conceptualizes LCDP use as a form of job crafting. Thus, we postulate that some citizen developers engage in forms of job crafting via LCDPs, indicating that some citizen developers are job crafters. Second, we contribute to the ICT-enabled job crafting literature, by providing insights on how LCDP technologies enable job crafting and expand upon ICT-enabled forms of job crafting. Further, we adapt job crafting and its underlying job resource demand theory to differentiate between six forms of job crafting as means to explain LCDP effects. To our knowledge, there has been no empirical work of technology that led to job crafting holistically, whereas our emergent results also indicate that LCDP technologies can affect all forms of individual job crafting. LCDPs are conceptualized as enabling contexts for job crafting.

For practice, we provide a novel motivation for employers to invest in LCDPs that allow the deployment of AI-based services. The positive effects of well-researched job crafting can lead to reducing fears of AI-based technologies and improve adoption within its workforce. The use of LCDPs can also be leveraged within the software implementation phase as a bottom-up approach to personalize and adapt individual work experiences and informing job role design. However, organizations should also be aware of the potential risks associated with group dynamics that arise with an increased level of job crafting opportunities. Non-job-crafters or professional developers might look disfavorably towards BUD endeavors, and organizational interventions need to be considered. In contrast, companies can leverage job crafting interventions as additional change management activities.

Limitations and Future Work

Our research is subject to certain limitations: In our data, we have come across a difference between shifting resource demand to increasing job resources across time. There is a difference between the initial adoption phase and the post-adoption phase. During the shakedown phase, the new LCDP can also lead to increased job demands, especially in light of the fear of substitution from chatbots. Future research could consider

researching job crafting across different adoption phases. We also found that some job crafting happened collaboratively, while we focus on individual job crafting of BUDs in our study. Research suggests that collaborative job crafting differs from individual job crafting (Mattarelli and Tagliaventi 2015). Due to this variation, further exploratory research can focus on tackling this collaborative form of job crafting. Furthermore, our study did not focus on the negative effects of job crafting during LCDP use. Yet, it is reasonablethat job crafters might have an adverse effect on non-job-crafters. Also, recent job crafting literature has also shown the negative consequence of job crafting (Cohen 2013, Lazazzara et al. 2020) if the environment does not support job crafting. To address this issue, we recommend future research to take further individual characteristics of users into account, especially a sense of control and social support.

We restricted the investigation to one particular LCDP technology. Widening the scope towards different forms of LCDPs might deliver additional insights into how BUDs can use these platforms to craft jobs. To expand upon our interview study as well as focus group discussion, future research could consider conducting case studies within companies to gain deeper insights into how BUDs develop on these platforms and how this influences their work environment. We encourage future research to test the theoretically and empirically driven propositions to investigate effect strengths and to evaluate the overall model. This can be done by a quantitative survey, including LCPD use (Wynne Chin W. et al. 2008), individual characteristics, such as sense of control (Lachman and Weaver 1998), forms of job crafting according to Tims et al. (2012), and outcome variables such as wellbeing (Harker 2001) or satisfaction (Judge et al. 2000) on the individual level. Because the use of LCDP, as a technology for job crafting, can be influenced by the environment, Lazazzara et al. (2020) recommend testing the propositions in a context that is as stable as possible for all participants, like one organization.

Conclusion

In conclusion, this paper provides novel insights into ICT-enabled job crafting forms. More specifically, this paper provides exploratory qualitative research based on investigating how LCDP use affects the BUDs' work environment. Thus, we have demonstrated that job crafting is a theoretical lens that can explain how BUDs leverage LCDP to perform ICT-enabled job crafting. We contribute to the LCDP literature by providing a novel conceptualization that provides insights into citizen developer behaviors and the impacts of LCDP on their work environment. For job crafting theory, our paper provides LCDP-specific job crafting forms that coincide with the call for technology-related job crafting forms (Lazazzara et al. 2020). For the IS literature, we contribute to the ICT-enabled job crafting literature (Tarafdar and Saunders 2021). We believe that job crafting provides novel approaches for specific technologies, such as LCDP, that can leverage job crafting motives and consequences to improve effective use and provides an understanding of LCDP as a new workplace technology and is a form of IT-enabled emergent work configuration (Baptista et al. 2020).

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