ECIS 2021 Research-in-Progress Papers   ECIS 2021 Proceedings

6-14-2021

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Abstract

Individuals and organisations are increasingly turning to artificial intelligence (AI) technologies to enhance productivity and performance. This research considers the impact of intelligent personal assistants (IPAs) on work practices. IPAs are intelligent applications that automate and perform routine tasks, collaborate with workers, and offer actionable insights and recommendations to help workers make data-driven decisions. In theory, using IPAs can improve workers' productivity by supporting and/or helping to transform relevant work practices. However, empirical field-based evidence substantiating such propositions is scarce, and there is little understanding of how such transformation may occur in practice. We, therefore, propose a multiple case study to investigate how work practices change when workers collaborate with IPAs. We aim to contribute to the body of knowledge that explores the relationship between human-AI collaboration and work practices. Moreover, we expect our research to provide useful insights for organisations to better understand the implications of AI in the workplace.

Keywords: intelligent personal assistants, conversational assistants, artificial intelligence, productivity, work practices.

1 Introduction

Organisations invest in productivity-enhancing technology hoping that it will increase knowledge workers' (KWs) productivity and consequently organisational performance. For years, organisations have leveraged advancements in technology to enable workers efficiency and collaboration; however, the productivity of KWs remains a major managerial challenge (Ebert and Freibichler, 2017); a challenge that Drucker (1999) argued will dominate the 21st century management agenda for several decades. KWs find it challenging to manage a broad range of competing work, tasks and responsibilities (Aral et al., 2012; Czerwinski et al., 2004), deal with interruptions, procrastination, find time to focus on work, effectively collaborate, and manage meeting and email overloads (Kimani et al., 2019; Winikoff et al., 2021). Enhancing and sustaining workers' productivity have become even more difficult as organisations transition to hybrid-remote work models in response to the COVID-19 pandemic. The disruptions brought by COVID-19 have negatively affected work-life balance, increased work-related fatigue (Palumbo, 2020) and led to lower productivity (Feng and Savani, 2020).

Advances in AI and data analytics have made it possible to design and develop technologies that address problem areas within the domain of worker productivity and performance. To this end, researchers have started exploring how intelligent technologies can assist workers by automating mundane and routine tasks, collaborating with workers, mediating, and facilitating information exchange among workers, as well as creating awareness of work and collaboration habits that affect productivity (Grover et al., 2020; Kimani et al., 2019). The term "intelligent" means the technology uses machine learning to interpret data, continuously learn and acquire knowledge and skills from such data, and perform tasks autonomously or collaborate with humans to achieve specific goals (Bailey et al., 2019; Kaplan and Haenlein, 2019). Among the intelligent technologies emerging in the workplace are intelligent personal assistants (IPAs). IPAs are highly complex and advanced technologies that help individuals perform personal and work-related tasks (Maedche et al., 2019). IPAs comprise an integrated set of intelligent software agents designed to perform routine and complex tasks and activities related to an individual's communication, information and time management, with or without direct user involvement (Azvine et al., 2000; Wooldridge and Jennings, 1994). In this study, we define IPAs as intelligent applications that automate and perform routine tasks, collaborate with workers, and offer actionable insights and recommendations to help workers make data-driven decisions. Apple's Siri, Amazon's Alexa for Business, IBM's Watson, Microsoft's Cortana, MyAnalytics and Workplace Analytics, and Google's Assistants and Work Insights are examples of IPAs. Gartner predicts that half of all workers will use IPAs daily by 2025 (Bradley, 2020) and that these tools will dominate the digital workplace in the next 5 to 10 years (Rimol, 2020).

The precursors to today's IPAs were mainly designed to support basic routine tasks that take up much of workers' time and significantly impact personal productivity (e.g. communication and information processing) (Azvine et al., 2000; Cross et al., 2019; Davis, 2002). But, following the embedding of AI technologies (e.g. machine learning) and big data analytics engines, this group of tools has evolved from technologies that just automate or reactively respond to user commands into technologies that can proactively or autonomously perform many other tasks, solve problems, uncover or produce behaviours automatically through what they have learned from users (Kaplan and Haenlein, 2019). Hence, IPAs enable and provide new opportunities for organisations to improve workers' efficiency and collaboration (see Bavaresco et al., 2020; Feng and Buxmann, 2020; Meyer von Wolff et al., 2020 for use cases and application of IPAs in the workplace). Researchers suggest that IPAs can help workers with wellbeing, productivity and workplace reflection (Grover et al., 2020; Kimani et al., 2019; Winikoff et al., 2021). Some researchers claim that IPAs can be companions, advisors, collaborators, mediators, and performance coaches (Bittner et al., 2019; Winikoff et al., 2021). Other researchers argue that IPAs' ability to interact and respond to workers in real-time and offer semi-automated and automated decision support helps workers with work prioritisation, task management, workplace reflection, focus and time management (Grover et al., 2020; Kimani et al., 2019). Lately, these technologies are being designed to evaluate workers' performance, recommend changes to work routines, and coach and nudge workers towards desired goals (Winikoff et al., 2021). These human-like behaviours make IPAs active influencers of workers' actions, decisions, and work habits; thus, users perceive them as actual human assistants (Fernandes and Oliveira, 2021).

Although the application of IPAs is promising for the reasons discussed above and others (Meyer von Wolff et al., 2020), the use of IPAs in the workplace is still sparse. IPAs are seen by various commentators as having the potential to transform work practices implicated in productivity management. This vision is in line with the argument that AI-based technologies can alter and shape different workplace facets, including work practices and organisational realities (Bailey et al., 2019; Faraj et al., 2018). Research on the impacts of digital technologies on work practices is well established (see the work of Leonardi, 2011, 2013; Leonardi and Bailey, 2008; Leonardi and Barley, 2008; Orlikowski, 2000, 2007; Orlikowski et al., 2014; Orlikowski and Scott, 2008, 2015). However, we know less about the impact of AI technologies on workers' daily practices. As AI technologies, IPAs can autonomously and continuously learn and adapt themselves to fit the user work context, making them different from traditional workplace technologies (Bailey et al., 2019). IPAs also have human-like features that open up new means of human-machine interaction (e.g., voice, text or

images). Therefore, IPAs provide opportunities to develop new work practices and present new challenges for workers and their work. However, information systems (IS) research offers insufficient knowledge and field-based empirical evidence to understand the usefulness and implications of IPAs in the workplace (Meyer von Wolff et al., 2020) and how IPA-enabled work practices transformation occur in practice. These are critical research areas, especially now that human-AI interactions are becoming customary in contemporary organisations. Organisations using or planning to implement AI productivity-enhancing technologies need to understand the implications of these technologies on workers and their daily practices. Hence, there is still a need to understand how IPAs are integrated into everyday practices and how new work behaviours and routines are developed as workers and IPAs work together. This research aims to: (a) e*xplore how work practices change when IPAs and KWs work together; and (b) understand how KWs interpret and respond to their emerging interactions* with IPAs. The research question investigated in this study is: *How do KWs' work practices change with IPA use in the workplace?* Next, we present the literature review, followed by the proposed research conceptual model and research methodology. The paper concludes by discussing the expected research contribution.

2 Literature Review

2.1 Intelligent personal assistants

IPAs have been described as systems that comprise an integrated set of intelligent software agents designed to perform routine and complex tasks and activities related to an individual's communication, information and time management, with or without direct user involvement (Azvine et al., 2000; Wooldridge and Jennings, 1994). An IPA may be a combination of many different software agents such as conversational agents, chatbots and search software agents. These agents are self-contained autonomous computer systems that are flexible, responsive to a user's environment, act proactively, and interact with other intelligent agents and humans to solve problems or perform task activities (Jennings and Wooldridge, 1998; Wooldridge and Jennings, 1994). IPAs use AI techniques such as machine learning to detect patterns in vast volumes of data and interpret their meanings to solve problems, uncover or produce behaviours automatically through past experiences (Davenport and Ronanki, 2018). IPAs interact or communicate with users via a natural language interface, which is a program that makes natural language conversation between computers and humans possible (Weizenbaum, 1966). Like other AI technologies, IPAs can be classified into different intelligence levels depending on their capabilities (Kaplan and Haenlein, 2019). Different AI classification models exist in the literature (e.g., Huang et al., 2019; Huang and Rust, 2021; Kaplan and Haenlein, 2019).

While both workers and non-workers can use IPAs, interaction with IPAs in a personal context differs from the interaction in the work context (Maedche et al., 2019). This is mainly because of the complex nature of the work context and tasks, the efforts and skills required to perform those tasks, and the expected task performance outcomes which differ significantly from those in personal contexts. Moreover, consumer and workplace IPAs have different purposes. Consumer IPAs are designed to enhance user experience and help customers interact with service processes, such as making purchase decisions in e-commerce platforms. Some consumer IPAs are designed to assist with personal and home-based activities such as turning lights on and off or looking up cooking recipes (McLean and Osei-Frimpong, 2019). In contrast, workplace IPAs are designed to support and perform workers' varied daily tasks in various scenarios that impact worker productivity (Berry et al., 2011; Grover et al., 2020; Kimani et al., 2019). The literature has pointed out three types of tasks that contribute to worker productivity: job-specific, knowledge-building, and work management tasks (Davis, 2002). Job-specific tasks produce output values to the organisations; knowledge-building and maintenance tasks involve frequent learning and development to acquire new or maintain existing knowledge; and work management tasks support workers' self-management such as allocating time, resources and attention needed to effectively and efficiently complete work (Davis, 2002). For the most part, IPAs are designed to support and assist workers with work management tasks, which include collaboration

management (e.g., identifying people to collaborate with) (Seeber et al., 2020), time management (e.g., schedule planning) (Berry et al., 2011), email management (reading and replying to emails), and task management (e.g., task chunking) (Kimani et al., 2019). These work management tasks contribute significantly to personal productivity but also take up too much of workers' available time (Berry et al., 2011; Cross et al., 2019; Kimani et al., 2019).

The literature discusses various IPAs with different capabilities and functional scopes that support workers with work management tasks. Some IPAs help workers schedule and block out time on their calendars to focus on essential tasks, monitor and intervene with distractions, and reflect on their daily moods and goals (Grover et al., 2020; Werner et al., 2019). Other IPAs support workers with prioritisation of work, scheduling work-related tasks, task switching, detaching from and reattaching back to work after a work break, reflecting on work at the end of the day and planning for the next day (Kimani et al., 2019; Williams et al., 2018). There is also a new class of IPAs that helps workers be aware of their behaviours within online collaboration platforms by providing insights into work habits and offering AI-powered suggestions to improve specific work behaviours (Winikoff et al., 2021). Although IPAs that support the aforementioned work management tasks differ in their capabilities, functional affordances, interaction modalities (text, speech or images), and purposes, their fundamental ability to understand user needs and contextualise such information remains the same (Lackes et al., 2019).

The overview of the literature shows that research on IPAs is still emerging. Some studies have focused on psychological aspects such as trust and privacy (Liao et al., 2019), adoption and use intentions and behaviours (Yang and Lee, 2019), users reactions to IPA autonomy (Hu et al., 2021) and the use cases and application of IPAs in the workplace (Meyer von Wolff et al., 2020). However, many of these studies are focused on IPA use in private settings, which does not help us fully understand IPAs' implications in the workplace. Researchers investigating IPA use in the workplace have suggested that IPAs can transform work practices by collaborating with workers or automating and performing routine work tasks and providing insights into work and work behaviours (Kimani et al., 2019; Winikoff et al., 2021). However, there is little research investigating how using these technologies transforms work practices and improves productivity in real work settings.

2.2 Technology and work practices

In a revelatory case study, Winikoff et al. (2021) highlighted how some daily productivity work practices changed with the introduction of a digital productivity assistant, thereby helping workers improve their productivity. This research plans to follow this line of investigation to gain an in-depth understanding of the effects of IPAs on work practices. We first must understand what practices are and what the literature says about the impact of technology on work practices. Cook and Brown (1999) define a practice as "the coordinated activities of individuals or groups in doing the "real work" as it is informed by a particular organisational or group context" (p. 386). A practice has also been defined as a "recurrent, materially bounded, and situated social action engaged in by members of a community" (Orlikowski, 2002, p. 256). Practices are social (Orlikowski, 2002; Reckwitz, 2002) and can be routines (i.e., patterns of actions) (Feldman et al., 2016; Leonardi, 2011) or routinised type of behaviours (Reckwitz, 2002). Examples of practices include learning, strategising, knowing, working, investigating, and many others (Chu and Robey, 2008; Jarzabkowski et al., 2007; Orlikowski, 2002; Reckwitz, 2002). Hence, work practices involved in personal productivity management can be considered as routine ways of performing a task to produce an outcome within a given time with a given set of resources as mediated and shaped by the context in which the task is performed. For example, collaboration planning is a work practice that involves finding and scheduling time to collaborate on a task (e.g., authoring a budget document) with other colleagues by considering and coordinating priorities, time, place, availability and cooperation of other team members. These practices can be "both individual (because performed by actors in their everyday action) and institutional (because they shape and are shaped by organisational norms and structures)" (Orlikowski 2002, p. 256).

Practices often change when individuals change their ways of acting in response to changes in their work situations or the work contexts (Vaast and Walsham, 2005). The introduction of new technologies in the workplace leads to changes in the nature of work and enables new forms of organising work (Bailey et al., 2019; Faraj et al., 2018; Zammuto et al., 2007). Emerging digital technologies provide opportunities to alter and transform existing organisational realities, including work activities, coordination, control hierarchies, communication, professional roles and work boundaries, socialisation, work practices and many others (Bailey et al., 2019; Günther et al., 2017). Research has already confirmed that introducing a new technology in the workplace leads to the creation of new work practices to fit the new reality (Leonardi and Bailey, 2008; Vaast and Walsham, 2005). When new work practices are created, existing work practices are eliminated entirely or altered, and the professional skills and expertise interwoven in those practices made obsolete as organisations and workers increase their reliance on the new technology and the resultant work practices (Faraj et al., 2018).

Because of the impact that technology has on workers and their ways of working, workers may respond positively or negatively to the technology, even though technology-enabled changes in work practices are not always immediate (Leonardi, 2013). In some cases, workers will fully utilise technology features that they perceive as being well aligned with their work context or work practices and ignore features that are not seen as being aligned with their work context or work practices (Christin, 2017). Workers are also most likely to be receptive to changes in work practices if the technology is perceived as beneficial (e.g., if it automates mundane and repetitive tasks that workers often consider to be uninteresting and tedious) (Chu and Robey, 2008; Leonardi, 2013). Workers are likely to treat technology with ignorance or resistance if it drastically changes their work, ways of working or the existing expertise required to execute a task (Christin, 2017; Chu and Robey, 2008; Lapointe and Rivard, 2005). Sometimes, workers will underutilise a technology if they feel pressured to respond and adapt to new practices but want to preserve their existing work practices (Chu and Robey, 2008).

A new technology that is associated with drastic alteration of existing work practices that workers have become accustomed to may be perceived as constraining work or human agency (Chu and Robey, 2008). This may result in tensions between workers and the technology (Möhlmann and Zalmanson, 2017) or different human actors' practices (such as management's vs. workers' practices) (Marabelli et al., 2020). In cases where workers perceive the new technology as either constraining or enabling their ability to achieve their work goals, they will change the technology or their work practices (Leonardi, 2011). Workers may also choose to "loosely couple" existing work practices with the new work practices to deal with the discrepancies between existing work practices and the new technology (Christin, 2017). Also, when workers find it difficult to understand and interpret the knowledge embodied in the new technology, they create entirely new work practices to resolve and prevent problems that might arise as a result (Leonardi and Bailey, 2008). Some workers respond by gaming the system or creating workarounds (Jhaver et al., 2018; Marabelli et al., 2020; Möhlmann and Zalmanson, 2017). For example, the introduction of electronic health record systems (EHRS) in an academic hospital led to disharmonious feelings among medical professionals. In response, medical professionals created workarounds that entailed either adjusting routines or changing the use of technology in those routines (Van Den Hooff and Hafkamp, 2018). Such workarounds have positive and negative side effects for "social others" and organisations in general; thus, they need to be managed with proper mechanisms (Marabelli et al., 2020; Van Den Hooff and Hafkamp, 2018).

3   Proposed Research Conceptual Model

Based on the literature review, we constructed a conceptual model in Figure 1, based on Maedche et al.'s (2019) socio-technical model of AI-based digital assistants, adding work practices to the model. We take the view that to understand how IPAs lead to a change in productivity work practices, we need to consider the context, the human actors (workers) whose practices are being transformed, and the tasks that are performed. Moreover, a socio-technical approach allows us to examine how workers

interpret, explore and exploit the opportunities and tensions between existing and emerging work practices, formal and informal work practices, and their interactions with IPAs.

The **IPA** in the context of this research (the bottom-left hand circle in Figure 1) is an intelligent application that automates and performs routine tasks, collaborates with workers, and offers actionable insights and recommendations to help workers make data-driven decisions. Because IPAs can learn and act autonomously, they continually observe worker behaviours and adapt accordingly based on what they have learned about workers and their tasks, and the feedback they have received from workers.
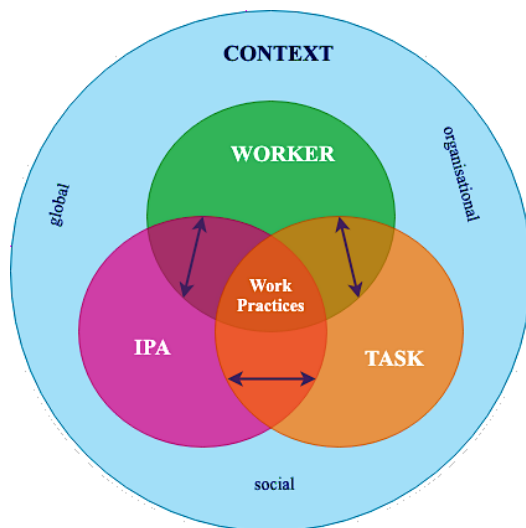

Figure 1.   Research conceptual model.

The workers of interest in this research (the top circle in the diagram) are KWs. KWs "have high levels of autonomy and discretion in how they do their work" (Davenport, 2002, p. 3). They are responsible for a significant amount of work done in organisations (Drucker, 1999), and their work contributes substantially to organisational innovation, growth and competitive advantage (Davenport, 2002; Reinhardt et al., 2011). Hence, their productivity is a significant concern for organisations (Ebert and Freibichler, 2017), and it have been claimed that IPAs can help address KWs work challenges.

The task (the bottom right-hand circle) represents work management tasks, which are work activities that workers perform to achieve the set goals. As discussed in the literature, IPAs are primarily designed to support workers with work management tasks such as time management, collaboration management, meeting management, email management. The interaction between workers, IPAs and tasks can either be proactive or reactive. Anytime a worker initiates the interaction with the IPA (worker→IPA), the worker is proactively interacting with the IPA, while the IPA reactively responds to the worker's instructions or communication. However, when the IPA initiates the interaction with the worker (IPA→worker), the IPA is proactively interacting with the worker, while the worker reactively responds to the IPA. Workers may collaborate or interact with IPAs (worker ⇔ IPA ⇔ task) to perform a task or may perform a task without IPAs' help (worker ⇔ task). However, IPAs can also autonomously perform a task without a worker's interventions (IPAs ⇔ tasks). The IPA and worker may also interact for information sharing purposes only (IPA ⇔ worker) about a task (e.g., feedback on task completion) or work context (e.g., work colleagues' calendar information), or worker's work practices insights (e.g., hours spent in meetings) without the need to perform a task.

The interactions between IPAs, workers, and tasks happen within a particular **context** (the outer circle), which may be impacted by social factors (e.g., trust or privacy concerns); institutional (e.g., norms, cultures, hierarchies, business working hours etc.) or global factors (e.g., different time zones, data protection regulations like General Data Protection Regulation (GDPR) etc.) (Zhang and Li,

2004)). The context shapes or can be shaped by workers' practices (Orlikowski, 2002). It can also shape the interaction between IPA and the worker (Maedche et al., 2019). The IPA needs to learn and understand the work context to have a personalised and contextualised interaction with the worker or perform a task in that work context. Previous studies (e.g., Collins et al., 2014; Winikoff et al., 2021) have found that IPAs often fail to consider key contextual factors about workers' tasks and environment, leading workers to perceive information as being less important or inaccurate, which influences workers' trust and behaviours towards the IPA. Understanding the work context helps us analyse and understand whether IPAs enable or constrain workers and their work (Leonardi, 2011).

At the intersection of IPAs, workers and tasks are **work practices**. Work practices represent the workers' patterns of actions or routines when performing tasks. The existing work practices may initially guide the interactions between workers and IPAs. However, as the literature points out, a change in the work context often leads to a change in work practices. Thus, new work practices may emerge as a result of the IPA-worker interaction. The resultant work practices result from the continuous agentic and relational dynamics between the IPA, worker, task, and the work context. A change in the work context (e.g., new work colleagues), or task (e.g., task performance frequency), or worker (e.g., change in preferences or skills), or the IPA (e.g., new interactive dashboard) may lead to changes in practices. So, work practices may be altered or replaced with new practices as the IPA learns about the task, workers (e.g., their preferences) and the work context. Existing work practices may also be altered or replaced with new work practices as workers decipher and make sense of their tasks, context, or interactions with the IPA and explore and exploit opportunities and challenges of the IPA. Eventually, the altered and/or new practices become the "new normal" way of working until they are changed.

4 Proposed Research Methodology

This research explores how work practices change when IPAs and workers work together. It also seeks to understand the emerging relationship between workers and IPAs and how workers interpret it. We propose a multiple case study design approach. A case study research design helps researchers study "contemporary phenomenon in their real-life context" (Yin, 1981, p. 98). Case study research is highly suitable for research seeking to explore new and emerging processes or behaviours, everyday practices and their meanings to those involved (Hartley, 2004). Several IS researchers have adopted a case study approach to investigate the influence of technology on work practices (Levina and Vaast, 2005; Leonardi and Bailey, 2008; Monteiro and Rolland, 2012; Vinther and Müller, 2018). A multiple case study is recommended for researchers aiming to describe, build or test theories (Benbasat et al., 1987). Multiple case study allows for cross-analysis of the phenomenon in different settings which increases confidence and generalisability of the study results (Miles and Huberman, 1994). This study seeks to develop a theoretical model to explain how work practices change when IPAs and workers work together; therefore, a multiple case study is deemed as the most suitable and appropriate research design to achieve the research objectives.

We plan to conduct this research in four New Zealand organisations that have widely adopted an IPA. Organisations will be identified and invited to participate through personal and professional contacts and professional platforms such as the Human Resources Institute of New Zealand, newzealand.ai, and the AI Forum of New Zealand. As it might be difficult to find organisations with similar characteristics (e, g., in the same industry or sector, or of the size or using the IPA), we will consider organisations with varying characteristics that are willing to participate and are accessible to the researchers. However, the IPAs to be considered should have similar functionalities (e.g., they should provide insights into work behaviours). We will purposively sample workers to participate in the interviews using the Criterion-i sampling strategy (Palinkas et al., 2015). Criterion-i sampling strategy allows researchers to identify and select participants who "meet some predetermined criterion of importance" (Palinkas et al., 2015, p. 535). A pre-sampling questionnaire will be sent out to participating organisations for workers to complete, and only workers meeting the selection criteria

will be included in the study. To participate, a worker must be a KW, have used the IPA for more than a month before data collection, and use the IPA at least once a week.

We will use semi-structured interviews, direct observations and self-reflection diaries as the primary data sources. Semi-structured interviews will be the primary data collection method of the study. Interviews offer flexibility to adjust interview questions and probe deep (Qu and Dumay, 2011) to understand the dynamic nature of work practices and workers' interpretation of their interactions with IPAs. Observations will help us monitor how workers interact with IPAs and the resultant work practices that workers adopt. Observations can also help us observe the work context to understand what influences change in practices or how IPA and workers interact. Self-reflection diaries are helpful in situations where physical observation is not possible (Czerwinski et al., 2004) and can help us gain insights into work practices that are less visible (Leonardi and Bailey 2008) or cannot be directly observed. The participants will be asked to document their experiences with the IPA, including the changes they have noticed about their daily routines, the issues they have experienced and how they resolved those issues.

We will take an exploratory approach to data collection and analysis. Data will be collected and analysed inductively and iteratively following qualitative research data analysis approaches (Creswell, 2007; Miles and Huberman, 1994) and thematic data analysis guidelines (Braun and Clarke, 2006). An exploratory approach allows for flexibility in data collection and analysis, allowing themes to emerge from the data and be analysed deeply (Orlikowski, 2002). In line with previous studies (e.g., Orlikowski, 2002; Orlikowski and Scott, 2015), the unit of analysis in this study is work practices as we seek to explore how work practices change with IPA use. As this is a multiple case study, data from each case organisation will be analysed independently (within-case), and after that, we will do a cross-analysis based on themes emerging from each organisation to allow comparative analysis in terms of similarities and differences (Creswell, 2007; Yin, 1981). During the later stages of the analysis process, we will refer back to the literature to identify a theory that can best help frame our study's findings and confirm our research contribution. To present the emergent theoretical model, we will link the themes to provide a coherent model.

5 Conclusions and Expected Contributions

Introducing new technology in an organisation often leads to the transformation of work and work organising. With their levels of intelligence, autonomy, and human-like features, IPAs have the potential to impact workers and their daily work routines drastically. As the impacts of AI technologies on work practices are still under-explored, IS researchers have been called to investigate the effects of AI and human-based intelligence on work and work practices (Bailey et al., 2019; Galliers et al., 2017; Huysman, 2020). This research responds to these calls by exploring and understanding how work practices change when workers and IPAs collaborate. We proposed a case study approach as a method of investigation. While we are still in the early stages of our research project, we expect to contribute to the literature investigating the nature of the relationship between human-AI collaboration and work practices. We intend to do so by combining the practice lens with the socio-technical perspective and extending this theoretical view to examine IPA use in the workplace context. We hope to develop a theory explaining how work practices change when workers and IPAs collaborate to manage personal productivity. We also expect our research findings to be relevant to practice. Organisations and workers using or planning to adopt IPAs need to understand the emerging patterns, dynamics of work and new practices resulting from using these technologies (Baptista et al., 2017) to effectively design future work and work practices. Our study aims to reveal such patterns, dynamics and practices.

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