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Short Paper

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Abstract

Firms struggle with improving end-to-end (E2E) processes due to difficulties in establishing shared E2E process understanding across firm levels. Creating behavioral visibility into processes might provide a solution, but traditional methods are limited in effectiveness. Thus, process mining (PM), offering data-driven process discovery and measurement, shows promise, but its implications on creating and acting on a shared E2E process understanding remain unclear. Addressing this gap, we conduct a single case study at a manufacturing firm guided by theories of organizational learning and organizational routines. Our preliminary findings reveal how the data-driven behavioral visibility through PM enables four mechanisms within and between the individual, team, and firm levels to create a shared E2E process understanding and change. We contribute to business process management and PM research by showing how firms use PM to overcome challenges in the multi-level process of creating and acting on a shared E2E process understanding.

Keywords: Process mining, business process management, organizational learning, case study research

Introduction

End-to-end (E2E)[1] process optimization, from initial customer request to customer fulfillment, has been a foundational principle in business process management (BPM) for decades (Maddern et al., 2014). However, its implementation in firms remains elusive due to a lack of shared E2E process understanding across teams (Dumas et al., 2013; Maddern et al., 2014). Shared process understanding refers to process participants sharing similar interpretations and reciprocal expectations about what is happening in a process. It emerges within teams as they collaborate on tasks and infer patterns from shared experiences about how the sub-process—as part of the E2E process—unfolds (Dionysiou & Tsoukas, 2013).

Extending this shared understanding to the E2E process at the firm level presents a challenge highlighted in industry reports and research (Christiansson & Rentzhog, 2019; Leyer et al., 2018; PwC, 2019). Due to firms' specialization, participants in E2E processes interact less, are spatially and hierarchically separated, and have varied process experiences (Feldman & Pentland, 2003). This gap in their shared performative

[1] The term E2E process optimization can be used to describe intra-firm process optimization within a firm (Dumas et al., 2013) or inter-firm process optimization between firms (Maddern et al., 2014). In this study, we focus on intra-firm process optimization within one firm.

experiences hinders a shared E2E understanding (Dionysiou & Tsoukas, 2013). Instead, individuals hold differing views of the E2E process based on their experiences and (partial) unawareness of others' actions (Dumas et al., 2013; Feldman & Pentland, 2003).

To bridge this gap and foster shared E2E process understanding, creating behavioral visibility (Leonardi & Treem, 2020) could provide a solution. Behavioral visibility refers to systematically representing individuals' behaviors so others can easily infer patterns (Leonardi & Treem, 2020). To gain visibility, firms traditionally use BPM techniques like collaborative process modeling, aided by modeling tools, expert interviews, and workshops (Dumas et al., 2013). However, these methods have limitations. Articulating, validating, and integrating subjective (possibly diverging) experiences, especially from skillful individuals with tacit, often unconscious knowledge, is challenging (Seethamraju & Marjanovic, 2009; Tsoukas, 2009). While discussing with others can aid this process, it unavoidably influences individuals which can lead them to describe the process differently from how they originally performed it (Tsoukas, 2009). Thus, the resulting E2E models can be distorted or incomplete, reflecting individual perspectives rather than a shared E2E process understanding at the firm level (Dumas et al., 2013; Malinova & Mendling, 2018).

However, digitization offers new ways to create behavioral visibility (Leonardi & Treem, 2020), particularly in E2E processes. Process mining (PM), an emerging big data analytics technology, creates visibility of actual E2E processes using digital traces in information systems (IS) to automatically generate process models and key performance indicators (KPIs) (Badakhshan et al., 2022; van der Aalst, 2016). Thus, PM might allow firms to foster and act on shared E2E process understanding. However, research on PM has, thus far, rather focused on the technical basis than on implications for process knowledge (Badakhshan et al., 2022; Grisold et al., 2020). This raises the question: *How do firms use PM to create and act on a shared E2E process understanding at the firm level?*

As part of an ongoing research endeavor, we conducted a single embedded, explanatory case study (Yin, 2014) at a German manufacturing firm. Drawing on 16 interviews and archival sources, we explore how firms use PM for shared E2E process understanding. Our theoretical framework builds on organizational learning (OL) (Crossan et al., 1999) and organizational routines (OR) (Feldman & Pentland, 2003) to conceptualize the multi-level process of creating shared understanding under the influence of PM. Our preliminary findings reveal how all firm levels interact with PM-enabled behavioral visibility, which (1) expands individuals' sub-process understanding, (2) provides a common truth for teams to create a shared sub-process understanding extending toward the E2E perspective, (3) offers a shared space for teams to negotiate and implement E2E process change, and (4) democratizes firms' E2E process control. We contribute to BPM and PM research by highlighting how firms use PM for creating and acting on shared E2E process understanding, overcoming the optimization of silos in firms.

Theoretical Foundation

Shared Process Understanding

Shared process understanding refers to process participants having "*compatible interpretations about what is happening [in the process] and reciprocal expectations for what is likely to happen next or what actions are appropriate*" (Dionysiou & Tsoukas, 2013, p. 196). OR theory indicates that shared process understanding between individuals emerges through an interplay between the performative and the ostensive aspects of a process (Feldman & Pentland, 2003). The performative aspect involves the joint execution of activities by process participants. Through their collective experience and interaction, participants abstract and generalize rules, forming at least a partially shared understanding of the process. This ostensive aspect subsequently guides participants' future process executions (Dionysiou & Tsoukas, 2013; Feldman & Pentland, 2003) and serves as the basis for identifying and coordinating process change (Dumas et al., 2013). This dynamic is particularly evident in teams, where individuals jointly engage in the performative aspect by working together on tasks (Dionysiou & Tsoukas, 2013).

However, extending this shared understanding to the firm level to encompass E2E processes "*from initial customer request to customer fulfillment*" (Maddern et al., 2014, p. 1303) presents significant challenges (Leyer et al., 2018). As firms are based on functional specialization and often organized in silos, members of different teams interact less frequently, are spatially and hierarchically separated, and have different experiences with the E2E process (Feldman & Pentland, 2003). This gap in their shared performative

experiences hinders the development of a shared E2E process understanding (Dionysiou & Tsoukas, 2013). Therefore, studying the emergence and use of a shared E2E process understanding at the firm level requires acknowledging the multi-level, fragmented nature of the firms that embed these E2E processes.

Organizational Learning

We additionally employ OL theory (Crossan et al., 1999; Schlagwein & Bjorn-Andersen, 2014) to study the emergence of shared understanding in firm-level E2E processes. OL theory addresses the "*process of improving actions through better knowledge and understanding*" (Fiol & Lyles, 1985, p. 803). It emphasizes interactions among individuals, teams, and the firm to transform individual/team insights into a comprehensive firm-wide understanding and coordinate change (Crossan et al., 1999; Rose et al., 2020). For systematic exploration, we use the 4I framework of OL by Crossan et al. (1999) as one of the most influential models to reflect OL's dynamic and multi-level nature (Schlagwein & Bjorn-Andersen, 2014).

The 4I framework shows OL across individual, team, and firm levels connected by intuiting, interpreting, integrating, and institutionalizing (4I) (Crossan et al., 1999). For E2E processes, we define the individual level with singular process participants, the team level with collaborating individuals in sub-processes, and the firm level with all individuals and governing institutions involved in the E2E process. OL begins with *intuiting* at the individual level, which refers to the preconscious recognition of patterns inherent in a personal stream of experience (Crossan et al., 1999), such as recognizing process patterns. Then, *interpretation* follows as individuals explain insights to each other to infer shared understanding (Crossan et al., 1999). This shared understanding is the basis for *integration*, where teams agree on coordinated actions to translate their shared understanding into practice (Crossan et al., 1999), such as process improvements. Last, *institutionalizing* ensures routinized actions at the firm level to embed learning, for example, through changing systems or processes (Crossan et al., 1999). Institutionalized learning endures until the environment changes and it becomes obsolete, initiating a new cycle of OL (Crossan et al., 1999).

While OL theory is valuable for conceptualizing firm-wide shared understanding and change, practice and research reveal limitations within E2E processes. For instance, skillful individuals struggle with articulating intuitively recognized process patterns, which become implicit with experience (Seethamraju & Marjanovic, 2009). Teams encounter complexities in interpreting and integrating conflicting process understandings into a shared sub-/E2E process understanding (Christiansson & Rentzhog, 2019; Dumas et al., 2013). Moreover, firms face challenges in institutionalizing and overseeing a shared E2E process understanding as they lack control mechanisms (Dumas et al., 2013). These hurdles underscore the need to understand how shared E2E process understanding emerges and can be facilitated.

Developing a Pre-Understanding

We argue that combining the perspectives of OL and OR can offer valuable insights into shared E2E process understanding at the firm level. In particular, OL theory (Crossan et al., 1999) conceptualizes the multi-level learning process involving individuals, teams, and the firm, while OR theory (Feldman & Pentland, 2003) addresses the foundational aspects of creating shared process understanding among individuals. However, combining these perspectives reveals a gap in our knowledge about how firms establish and act upon shared understanding within the context of E2E processes (Figure 1).

Our conceptualization of creating and enacting shared E2E process understanding unfolds as follows. Initially, individuals in the E2E process develop a sub-process understanding from personal experiences, recognizing process patterns *intuitively*. In teams, these individuals contribute to a shared understanding of the sub-process through collective *interpretation*. Multiple teams in the E2E process collaborate to *integrate* their understandings, forming a shared E2E process understanding that informs potential process changes. However, firms' compartmentalized structure poses a challenge: teams often lack shared E2E process experiences, impeding the formation of shared understanding. This also complicates *institutionalizing* the shared E2E process understanding and changes.

Recent research suggests that while the absence of shared experiences hinders shared E2E process understanding, creating behavioral visibility (Leonardi & Treem, 2020) could help. Yet, traditional BPM techniques for creating visibility, like collaborative process modeling, often yield incomplete E2E process models reflecting individual understanding (Dumas et al., 2013; Malinova & Mendling, 2018). However, recent technical advancements offer new possibilities for behavioral visibility (Leonardi & Treem, 2020),

particularly PM. PM provides E2E process visibility by analyzing digital traces in IS, aggregated into event logs reflecting real processes (Badakhshan et al., 2022). Through PM, firms can (1) discover process flows without prior knowledge, (2) assess conformance to desired models, and (3) enhance existing models with real process characteristics (van der Aalst, 2016). Although PM is restricted to processes recorded in IS, it is currently considered the leading technology for E2E process visibility (Badakhshan et al., 2022). Yet, due to its novelty, our understanding of PM's application in firms is limited (Grisold et al., 2020), leaving questions about how PM supports the emergence and enactment of shared E2E process understanding.

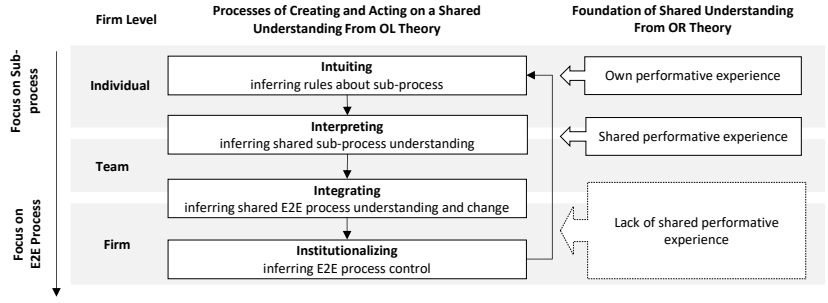

Figure 1. Theoretical pre-understanding of the OL process of creating and acting on a shared E2E process understanding and its foundations.

Research Approach

To study the novel phenomenon of how firms utilize PM to establish and act upon a shared E2E process understanding, we conducted a single embedded, explanatory case study (Yin, 2014). Using an interpretivist lens (Walsham, 1995), we gathered qualitative data via semi-structured expert interviews, which we analyzed abductively (Langley, 1999; Timmermans & Tavory, 2012). First, we employed **theoretical sampling** (Eisenhardt, 1989) guided by two criteria: (1) The firm has successfully implemented and acted on PM, creating and leveraging a process understanding through PM. (2) The firm's PM users originate from different roles and hierarchical levels, thus allowing us insights into the underlying multi-level OL process. Therefore, we selected "TextileCorp," a German textile machinery manufacturer with international subsidiaries (>2,700 employees and >$660 million in revenue in 2021). TextileCorp adopted PM 2018 during a digitalization effort to enhance on-time-delivery (OTD) (i.e., the ratio of customer orders shipped before or on the requested delivery date) and gradually implemented seven processes. PM at TextileCorp is organized decentralized, with teams autonomously creating and using PM supported by a central Center of Excellence (CoE). TextileCorp's PM users come from different hierarchy levels, including operational staff, team leads, and department managers. To ensure methodological rigor through replication, we adopted an embedded case study design (Yin, 2014), focusing on TextileCorp's three most mature PM implementations: the E2E order-to-cash (from customer order to receiving payment), warehouse management (from procurement to production), and manufacturing (from product design to delivery) processes. These served as our units of analysis, examined at the individual, team, and firm levels of analysis, aligning with our theoretical pre-understanding.

Next, we **collected qualitative data** through 16 semi-structured interviews (Myers & Newman, 2007), each lasting around an hour (Table 1). We interviewed CoE members and process participants in varying PM roles at different hierarchy levels, such as business users (apply PM to support their routines with insights), analysts (additionally create analyses), or data engineers (additionally maintain the technical infrastructure). The interviews were conducted based on an interview guide aligned with our theoretical framework (Myers & Newman, 2007), initiating discussions on experiences with PM, learning about processes, and individual/collective PM use, with openness to emerging topics. Additionally, we included eight archival sources to triangulate our qualitative data, such as reports, newspaper articles, and videos.

Our **data analysis** adhered to the process theorizing strategies of Langley (1999) utilizing an abductive approach (Timmermans & Tavory, 2012). This approach enabled us to recombine a unique and novel process phenomenon, such as creating and acting on a shared E2E process understanding through PM, with a contextual framework, such as OL and OR theories, to create a deeper understanding of the phenomenon from a new theoretical perspective (Dubois & Gadde, 2002). Our analysis was iterative,

involving both inductive reasoning via grounded theory coding (Strauss & Corbin, 1994) and deductive reasoning guided by OL and OR theory. For the inductive component, we derived emerging themes and concepts from the data through open, axial, and selective coding (Langley, 1999; Strauss & Corbin, 1994). We coded 769 first-order concepts, which we then analyzed for similarities and differences, which resulted in eight second-order themes reflecting mechanisms and outcomes of creating and acting on a PM-enabled E2E process understanding: *expanding individual understanding* leading to *understanding of individual role in the sub-process; providing common truth* leading to *shared understanding of sub-process expanding toward E2E*; *opening a shared space for action* leading to *implementing E2E process changes*; *democratizing process control* leading to *continuous E2E process control and bottom-up change*. Iteratively integrating inductive coding with deductive analysis, we aligned the second-order themes with the dimensions of the 4I framework to elucidate the OL processes creating and enacting a PM-enabled E2E process understanding. Throughout this abductive analysis, we iteratively engaged with data, codes, and existing theory to deepen our comprehension while remaining receptive to novel insights, like the impact of PM's technical features on shared E2E process understanding.

#	Hierarchy Level	PM Role	Department	PM Experience	#	Hierarchy Level	PM Role	Department	PM Experience
1	Employee	Data Engineer	CoE	3 years	9	Employee	Data Engineer	CoE	3 years
2	Employee	Data Engineer	CoE	1,5 years	10	Department Manager	Business User	Logistics	2 years
3	Employee	Analyst	Logistics	3 years	11	Employee	Analyst	Production	1 year
4	Employee	Data Engineer	CoE	3 years	12	Team Leader	Analyst	Sales	3 years
5	Employee	Data Engineer	CoE	3 years	13	Employee	Business User	Production	0,75 years
6	Employee	Analyst	Production	2 years	14	Department Manager	Business User	Sales	3 years
7	Employee	Analyst	Production	2,5 years	15	Department Manager	Business User	Production	1,5 years
8	Employee	Analyst	Logistics	1 year	16	Team Leader	Business User	Production	1,5 years

Table 1. Overview of the expert interviews.

Preliminary Findings

Our preliminary findings at TextileCorp indicate that PM created a data-driven layer of behavioral visibility that mediated OL between all firm levels and provided a foundation for inferring a shared E2E process understanding and change (Figure 2). In technical terms, TextileCorp accomplished this by applying PM for each of the three examined E2E processes to integrated event logs. These event logs derived from the various IS that were part of the respective process. We will subsequently discuss how TextileCorp's use of PM's technical features influenced OL about E2E processes at all levels, from individual to firm.

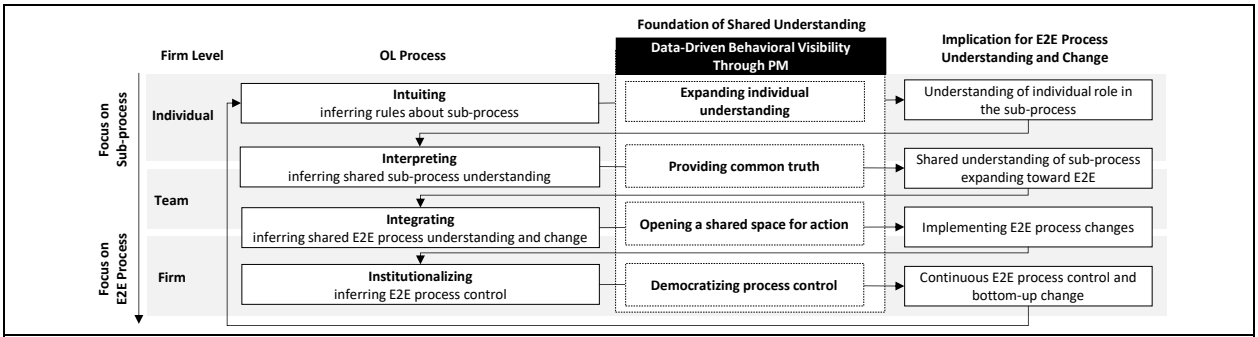

Figure 2. Influence and implications of PM use on the OL process of creating and acting on a shared E2E process understanding.

Expanding understanding at the individual level

At the individual level, TextileCorp employees leveraged PM for automatic process discovery, thereby gaining data-driven visibility into conscious and unconscious activities in their sub-processes. Consequently, PM provided a factual, comprehensive foundation for individuals to intuit about their roles and activities in their sub-processes.

Before the implementation of PM, employees relied on their personal experiences and observations to understand processes. However, much of this understanding remained unconscious due to their extensive experience and skill. For example, warehouse workers were unaware of the frequent failures of handheld scanners used for registering products in the ERP system, leading to manual entries. They also lacked

awareness of how these manual entries impacted their team's sub-process.

The adoption of PM changed this by introducing data-driven visibility into all (traceable) behaviors in E2E processes. PM accomplished this by automatically generating process models based on event data from the underlying IS. As individuals explored these models, their intuitive grasp of process patterns was sparked when encountering a dissonance between their experiential understanding of sub-processes and PM's data-driven insights. For example, through PM, the warehouse manager and workers became aware "*that the scanners were frequently failing and did not provide the required functionality"* (Data Engineer, CoE)—insights previously unconsciously overlooked that prompted a re-evaluation of their previous practices.

This dissonance acted as a catalyst for individuals to gain deeper insights into their actions within sub-processes and how these actions intertwined with preceding and subsequent activities. Nevertheless, this understanding remained constrained within the boundaries of sub-processes. Since individuals had limited exposure to the E2E process, they did not experience intuition on E2E process patterns revealed by PM. Consequently, they concentrated their PM analyses primarily on their respective sub-processes.

Providing common truth at the intersection of the individual and team levels

In team environments where individuals collaborate on the same sub-process, PM served as a tool for discovering flows and measuring the performance of both sub-processes and E2E processes through KPIs. This data-driven process visibility created a "common truth," aiding the formation of shared sub-process understandings within teams that extended to an E2E outlook.

Before PM's adoption, team members struggled to harmonize their sub-process understandings. The divergence in their individual process experiences and the lack of concrete evidence to validate these experiences hindered the resolution of conflicts and the validation of insights. As one business user in sales noted, "*you just need facts to address a process issue in front of others; otherwise, it's hard*." This lack of evidence led to skepticism and siloed thinking, with "*everyone liv[ing] in their own world only thinking about their silos*" (Analyst, Production), hindering a shared E2E process understanding.

The advent of PM transformed this negotiation for a shared process understanding within and across teams by offering data-driven insights into process flows and performance metrics. While individual and shared process experiences remained critical, PM provided teams with empirical grounding to validate these experiences and reconcile differing viewpoints about what activities the process consists of. PM's data-driven, objective insights became accepted "proof," allowing teams to confirm or challenge existing beliefs and uncover unnoticed process patterns, like inefficient flows. PM's flexibility also enabled teams to adjust analyses or adopt new KPIs to meet evolving needs. For example, TextileCorp's warehouse team adjusted their KPIs to better align with the actual concerns of warehouse operators, who "*did not care about that number [the original OTD KPI] because they only care about getting the picking of goods done on time*" (Department Manager, Logistics). Thus, they shifted from OTD to the time required for goods picking as a valuable KPI for the team.

Furthermore, the E2E visibility afforded by PM empowered teams to recognize the wider implications of their sub-processes and engage with other teams. The warehouse team, for instance, partnered with the sales team to evaluate the order-to-cash process, aiming to "*include all perspectives into the PM analyses and address E2E process stakeholders with KPIs in their language*" (Department Manager, Logistics). This cross-team collaboration, facilitated by PM's E2E behavioral visibility, fostered a shared E2E process understanding and identified avenues for process improvement.

Opening a shared space for action at the intersection of the team and firm levels

Among teams, PM acted as a tool to uncover actual E2E process flows. This enhanced visibility revealed the interdependencies between teams, shedding light on how their actions impacted one another. As a result, the data-driven E2E visibility created a shared space for collaborative action to enhance E2E processes. This transparency promoted both horizontal and vertical teamwork for deciding on and executing E2E process improvements.

Before implementing PM, TextileCorp's teams faced challenges in reaching a consensus on measures for E2E process improvements. Fueled by subjective experiences, debates frequently revolved around the legitimacy of perceived problems, for example, "*whether the supposed problem is a problem at all*"

(Analyst, Production). This divergence in viewpoints led to disagreements over accountability, with some teams questioning the very existence of a problem while others sought to identify the responsible party. Consequently, this lack of consensus resulted in a general reluctance to initiate E2E process changes, as teams "*did not take problems seriously*," according to an Analyst in Sales.

The implementation of PM reshaped inter-team dynamics at TextileCorp by offering E2E process visibility and quantifiable metrics for identifying process problems, their root causes, and subsequent consequences. As teams engaged in collaborative PM analyses, the resulting process models and KPIs formed a data-driven foundation for discussing shared insights into process issues and devising potential solutions. This shift facilitated solution-oriented dialogues and improved collaboration, both horizontally among teams and vertically between teams and management. For example, in the context of TextileCorp's order-to-cash process, the sales team's PM analysis identified frequent manual adjustments in shipment terms. Discovering that this issue primarily affected webshop orders, the sales team partnered with the IT team to establish a shared problem understanding grounded in PM data. With managerial backing, both teams effectively resolved the issue, traced back to an order form error in the webshop.

Democratizing process control at the firm level

At the firm level, PM was used by both teams involved in the E2E process and governing bodies like process owners and management to control E2E processes by continuously creating and using a shared understanding. PM offered stakeholders continuous E2E process visibility, using up-to-date process data and adaptable analyses. This visibility supported the continual negotiation of a shared E2E understanding and allowed all stakeholders to control the process. This shift transformed the nature of E2E process control, moving from a hierarchical, top-down structure to a more democratic approach.

Before adopting PM, TextileCorp used a top-down approach for E2E process control. Upper management had operational control, identifying and mandating interventions to tackle process issues. However, this approach unintentionally reduced responsibility among operational employees for E2E processes. This led to employees either "*[holding] back to point out problems*" (Analyst, Production) or not prioritizing E2E process understanding. Additionally, TextileCorp struggled to effectively monitor and evaluate the impact of E2E process changes, as they "*did not monitor the changes [they] made and never knew if changes were really implemented*" (Data Engineer, CoE).

The introduction of PM changed TextileCorp's E2E process control. By democratizing access to PM, E2E process models and KPIs became accessible throughout the firm. This transparency motivated stakeholders to assess their E2E processes actively, taking charge of their actions and "*approaching others to address problems from the bottom up*" (Analyst, Production). For example, TextileCorp's warehouse team integrated PM into daily shop floor meetings, allowing all staff to explore process KPIs and deviations. Through this continuous and democratized transparency, stakeholders controlled and guided E2E processes, ensuring that issues were addressed and changes were institutionalized.

Preliminary Discussion and Next Steps

As part of an ongoing research project, our study contributes to the literature on BPM and PM by showing how data-driven process transparency through PM changes a firm's understanding and improvement of E2E processes. In particular, our preliminary findings highlight that PM enables firms to address challenges in the multi-level process of creating and acting on a shared E2E process understanding and, consequently, contributes to overcoming the local optimization of process silos in firms.

Our research advances BPM research by revealing how PM introduces behavioral visibility (Leonardi & Treem, 2020) to aid in creating and acting on shared E2E process understanding. Challenges in this process are known (Maddern et al., 2014) because participants in E2E processes lack shared performative experiences (Dionysiou & Tsoukas, 2013), resulting in difficulties in achieving shared understanding across organizational levels (Leyer et al., 2018). However, the extent to which behavioral visibility introduced through technology such as PM influences this process has remained elusive. Our research addresses this gap by conceptualizing the underlying multi-level OL dynamics connecting individuals, teams, and the firm to show how PM introduces behavioral visibility to all 4I processes: (1) individuals leverage PM-derived visibility of sub-processes to validate and expand their own tacit performative experiences, thereby

uncovering unnoticed process patterns, (2) teams leverage PM for process visibility and metrics to validate their shared performative experiences and harmonize divergent perspectives into a shared sub-process understanding, extending to encompass E2E perspectives, (3) multiple teams in E2E processes, having differing performative experiences, use PM's adaptable process visibility and metrics to anchor their discussions around a shared E2E understanding and facilitate change, and (4) all E2E process stakeholders use PM's continuous, data-driven insights to institutionalize the negotiation of shared E2E understanding and democratic process control.

Our study emphasizes that while shared experiences play a vital role in creating shared process understanding (Feldman & Pentland, 2003), in modern function-oriented firms, gaps in these shared experiences are common due to complex E2E processes. In this context, we show that PM-enabled behavioral visibility (Leonardi & Treem, 2020) can bridge these gaps. It's important to note that this visibility does not replace experiences but provides a data-driven reflection of individual experiences that have been recorded. This reflection becomes a common truth within and among teams, allowing the inference of shared understanding, constructive negotiations, and informed decisions in E2E processes.

Second, our preliminary findings contribute to research on the organizational implications of PM by highlighting PM's potential to transcend local process silos and promote optimization of global optima in E2E processes (Maddern et al., 2014; Mendling et al., 2020). Previous research highlights that achieving E2E process optimization requires not only process transparency (Dumas et al., 2013) but also cultural elements like shared process language (Christiansson & Rentzhog, 2019) and process thinking in the workforce (Leyer et al., 2018). While we know that PM provides firms with E2E process transparency (van der Aalst, 2016), our findings also show how the joint use of PM throughout the firm facilitates the emergence of shared process language. For example, PM provides process KPIs tailored to the needs of various stakeholders, as observed in TextileCorp's warehouse and sales teams. Furthermore, PM enhances process thinking by revealing interdependencies and causal relationships across firm levels. This empowers firms to focus on optimizing E2E processes, transcending the constraints of individual sub-processes.

We acknowledge that our study has limitations. Firstly, PM's technical constraints confine its applicability to processes recorded in the IS. Although TextileCorp employs IS to support E2E processes, non-digital activities like phone calls are beyond PM's scope. Consequently, these non-digital processes might be inadequately represented in the firm's shared E2E process understanding. Secondly, our initial data collection approach has methodological limitations. We interviewed several members of TextileCorp's CoE to comprehensively understand their PM implementations. Given their roles, these CoE members engage with stakeholders across the E2E process, potentially granting them a deeper ex-ante E2E process understanding. To address this, we've complemented these insights with input from analysts and business users in the operative teams. We plan to further explore their perspective in our future research.

In our ongoing endeavor, we plan to advance our study with a particular focus on deepening our understanding of the feed-forward and feedback OL processes for creating a shared E2E process understanding. First, our efforts will involve gaining a more intricate insight into the feed-forward OL processes, as initially explored in this study. We will achieve this by including additional E2E PM implementations at TextileCorp, such as their purchase-to-pay process. In addition, we will engage with process stakeholders at all levels of the organization through interviews and observations of collaborative PM usage. Second, we plan to delve into the study of feedback OL processes. Research indicates that these processes, involving the "unlearning" and modification of previously acquired knowledge, can be challenging (Crossan et al., 1999). Such challenges may lead to inertia and an inability to adapt (Fiol & Lyles, 1985). Our focus will be on uncovering how firms interact with the E2E process understanding and change that PM brings about over the long term. For instance, we are curious whether firms question the process understanding established by PM and embark on creating entirely new process designs that extend beyond mere improvements. To this end, we intend to expand our case study to a longitudinal perspective by conducting additional interviews at TextileCorp at multiple points in time to reveal how process understanding and change have evolved.

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