

How Managers Frame and Make Sense of Unexpected Events in Project Implementation

Abstract

This paper examines how managers' framing and sensemaking of unexpected events alters and adapts over time during the course of a major project implementation. By adopting a process ontology, we study the temporal evolution of framing and sensemaking of unexpected events and how they recursively influence each other. We show how over time managers' sensemaking shifts from one form of sensemaking to another as they frame and reframe events to cope with changes in their environment.

Our study contributes in two important ways. First, we contribute to the discussions on framing and sensemaking literature by illustrating how they manifest recursively. In particular, we show how change in framing of events alters the form of sensemaking and how new forms of sensemaking enable actors to reframe their expectations. Second, we contribute to discussions on how project managers cope with unexpected events in large complex projects which may lead to failures or project termination. We show how unexpected events not only disrupt actors' mental frames of what and how to accomplish as part of project implementation, but also how they rework their expectations to adapt and move forward.

Keywords:

Sensemaking, Framing, Unexpected, Project implementation

Introduction

Experiencing unexpected events and dealing with changes in the environmental conditions is common in project implementation (Söderholm, 2008). Such events can be characterized as unexpected because they occur outside of project stakeholders' frames of expectations that may be guided by the risk management practices (Pitch, Loch & De Meyer, 2002). Unforeseen or unexpected events may emerge due to the complex interaction of factors internal or external to the project's environment and disrupt the expected flow of implementation (Aaltonen et al. 2010). Whilst the project management literature has extensively discussed various strategies available to managers to either anticipate or respond to future events (e.g. Söderholm 2008), they can be hard to foresee or manage (Wideman, 1992, Williams, 1999). An emerging stream of project management literature has adopted the sensemaking perspective to examine how managers cope with unexpected events once they have occurred (Alderman, Ivory, McLoughlin & Vaughan, 2005, Gacasan & Wiggins, 2016, Luna-Reyes, Andersen, Black & Pardo, 2021).

When faced with events that are surprising, actors' expectations about their projects can be interrupted thus prompting them to reconstruct their sense of the environment and restore order (Weick, Sutcliffe & Obstfeld, 2005). Sensemaking is a social process through which actors adapt their action when faced with surprising events during project implementation (Tukiainen, Aaltonen, and Murtonen 2010) and transition from a sense of equivocality created by the changes in their environment to a sense of order to enable their projects to continue (Weick, Sutcliffe & Obstfeld, 2005). Whilst studies adopting the sensemaking perspective have provided us with insights into how project managers practically cope with changes due to the unexpected events, they have generally focused on a particular form of sensemaking. This would imply that actors adopt one form of sensemaking to cope with and navigate complex

changes in their project environment. In this study, we examine how actors' sensemaking forms change over time as they attempt to restore their sense of the project environment and work out what's next.

A separate, albeit limited, stream of research in project management has explored the role of framing as a mechanism to cope with uncertainty and manage risk in projects (M. Martinsuo, Korhonen, and Laine 2014). How actors frame problems and risks in projects shapes their course of action going forward (Howard-Grenville, Hoffman, and Wirtenberg 2003; Clegg et al. 2018; Stjerne, Söderlund, and Minbaeva 2019; M. Martinsuo, Korhonen, and Laine 2014). Furthermore, adopting project management tools and frameworks serve as framing devices to guide managerial decisions and expectations around project implementation (Sanz-Llopis and Ostermann 2020; Fortune and White 2006). However, whilst research has examined the role of frames in configuring or re-configuring action, the literature has generally assumed a stable notion of framing whereby actors may adopt or promote a particular frame. How actors' frames alter to cope with the changes in their environment remains underexplored in project management. Understanding how actors' frames modify when faced with unexpected events can help us develop more nuanced understanding of how managers cope with the changes in the environmental conditions to proceed, terminate or revise their project intentions and implementation.

Framing and sensemaking are interconnected as "a cue in a frame is what makes sense" (Weick 1995, 53). When faced with novel environments and unexpected events, individuals draw on their existing repertoire of frames to make sense of what is going on (Maitlis and Christianson 2014; Kaplan 2008). Where there is no frame or there is no obvious connection between the existing frame and cues, actors will work to form a frame through the process of sensemaking (Maitlis and Christianson 2014). However, we know little about how actors frame and reframe

their sense of risk in project-based environments when they experience unexpected events which over time may significantly alter the course of project implementation, and the role of sensemaking in enabling them to restore order by modifying their frames. In this study, we examine how actors' frames and sensemaking recursively interact over time and through this process actors reconfigure their expectations during project implementation and cope with changes in their environment.

The context for our study is a major project managed by a UK based company investing several millions of British pounds to introduce two new information systems and commissioned a software development firm to help them accomplish this objective. We adopted a processual longitudinal study (Langley 1999) to explore how over time unexpected events triggered sensemaking among the project participants and how they revised their frames. Single case research design is well suited for exploring the micro-dynamics of how actors interpret events and alter their frames to enact their environment longitudinally. Our analysis of the dynamic relationship between framing of events and various forms of sensemaking was guided by the conceptual frameworks from the extant sensemaking literature (Maitlis and Christianson 2014). By drawing on the extant sensemaking constructs in our analysis we develop a more nuanced processual understanding of how actors navigate unexpected events over time by reworking their frames and re-ordering their sense of the project environment. By identifying and connecting different forms of sensemaking, which the extant research largely examined separately, we show how actors reconfigure their frames.

Our findings enable us to extend our understanding of how actors implementing large projects attempt to navigate surprises posed by unexpected events (Weick, Sutcliffe, and Obstfeld 2005). We extend the discussions on sensemaking perspective by showing how actors adopt different forms of sensemaking over time as they rework their frames. Finally, we contribute to discussions in project management by exploring how actors cope with the environmental

changes during project implementation through sensemaking and framing of events and expectations.

Theoretical background

Sensemaking

Rooted in the early organizational psychology work of Daniel Katz and Robert Kahn (e.g. Katz and Kahn 1966; Hackman, Katz, and Kahn 1979), sensemaking has emerged as an influential perspective in understanding how people construct meaning to their collective experiences (Brown, Colville, and Pye 2015). Sensemaking is a social process by which people make sense of the unexpected events and ambiguous environments, and thus bewildering or perplexing in light of unmet expectations (Hekkala, Stein, and Rossi 2018; Jensen, Kjærgaard, and Svejvig 2009; Gacasan and Wiggins 2017; Maitlis 2005). Scholars have extensively used the sensemaking perspective to study phenomena where actors experience interruptions in their expectations and change in their environment (Maitlis and Christianson 2014). As unexpected events violate managers' expected state of their project environment, their sense of order is interrupted (Weick, 1995, Weick, Sutcliffe and Obstfeld, 2005). Multiple interpretations of their equivocal environment may present new conditions as opaque, ambiguous and confusing. Thus, actors' experience of ambiguity becomes associated with confusion and contradictory perspectives in comprehending what is going on (Weick, Sutcliffe and Obstfeld, 2005).

With its emphasis on the processes by which people make sense of changes in the project environment that are unexpected, ambiguous, and thus bewildering or perplexing in the light of unmet expectations, sensemaking serves as a useful lens to studying actors' lived experience of managing projects (e.g. Hekkala, Stein, and Rossi 2018; Jensen, Kjærgaard, and Svejvig 2009; Gacasan and Wiggins 2017). When their sense of the environment is interrupted, actors try to comprehend and clarify what is happening and enact order (Maitlis and Christianson

2014). Thus, sensemaking offers project management scholars a useful perspective (Brown, Colville, and Pye 2015) to study how actors' interpretations and actions change or maintain over time in the process of practically coping with changing conditions.

Maitlis and Christianson (2014) note that there has been a proliferation in the conceptual development around the forms of sensemaking in organisation studies (see table 1). Management scholars theorized different forms of sensemaking enabling actors comprehend what is going on and what to do next. Studies have generally focused on a specific form of sensemaking, though some forms have often been shown to manifest in conjunction with the core sensemaking construct to explain various phenomena (for example, see Gioia and Chittipeddi 1991). Theorizing new forms of sensemaking helped scholars to explain nuances of the phenomena studied and advance theorizing of the sensemaking processes. However, our understanding of how actors' sensemaking itself might change over time as their environment changes remains limited.

Sensemaking-related construct	Definition
Sensebreaking	<i>“the destruction or breaking down of meaning.”</i> (Pratt 2000, 464)
Sensedemanding	<i>“strenuous efforts to acquire and process information so as to establish a workable level of uncertainty’ and equivocality</i> (Weick 1969, 40).” (Vlaar, Fenema, and Sense 2016, 240)
Sense-exchanging	<i>“different conceptions of organisation are negotiated to socially construct the identity of an organisation.”</i> (Ran and Golden 2011, 421)
Sensegiving	<i>“attempting to influence the sensemaking and meaning construction of others toward a preferred redefinition of organizational reality.”</i> (Gioia and Chittipeddi 1991, 442)
Sensehiding	<i>“discourse can be mobilizing in terms of promoting a specific kind of thinking and action or manipulative in terms of hiding particular ideas.”</i> (Vaara and Monin 2010, 6)
Sense specification	<i>“silencing alternative senses of integration or marginalization of particular voices.”</i> (Monin et al. 2013, 262) <i>“specification of explicit or implicit norms ... coining of principles, exemplary decisions and actions, symbolization, and quantification.”</i> (Vaara and Monin 2010, 262)

Table 1: Examples of Specific Sensemaking-Related Constructs (Maitlis and Christianson 2014, 69)

Scholars have argued that our understanding of how actors implement projects can be advanced through sensemaking perspective (Alderman and Ivory 2011; Alderman et al. 2005; Thomas 2000). For example, Alderman and Ivory (2011) propose that sensemaking can offer scholars to understand “the processes of organizing projects” rather than merely focusing their structures, tools and techniques. Furthermore, the plurality of project actors not only implies different claims they make within the projects, but also different interpretations emanating and giving rise to multiple meanings (Alderman et al. 2005). In addition, Fellows and Liu (2016) conceptually explored the role of cultural schemas and their influence on sensemaking in the context of multi-national projects where actors may bring their cultural frames.

Some empirical studies have shown the role of sensemaking in developing a shared view among the project stakeholders. For example, Jenkin, Chan, and Sabherwal (2019) show how sensemaking and sensegiving processes enable mutual understanding among project stakeholders and similarly, Brunet and Forgues (2019) revealed the role of collective sensemaking in creating convergence among actors in the amphitheater project in Canada. Furthermore, Gacasan & Wiggins (2017) have examined project managers' experiences and their assessment of cues during a disaster recovery project. Whilst these studies provided insights into the role of sensemaking in project management, they emphasized the role of sensemaking in helping actors to get 'on the same page' and enabling shared understanding about the project among those actors. There is an implicit tendency to treat sensemaking as an independent variable that enables actors to accomplish a particular outcome, rather than exploring how sensemaking itself might change over time as events unfold or how actors cope with changes over time. Exploring sensemaking temporally is crucial to our understanding of the dynamic nature of the evolution of sensemaking and how actors work through the unexpected events during project implementation.

Adopting a process ontology (Langley and Tsoukas, 2009) can enable scholars to explain how particular phenomenon evolves over time. Bringing time into studying project implementation is crucial to our understanding of how actors accomplish their project outcome over time and why projects evolve in the ways not intended at the start. Adopting a temporal orientation in studying project management, scholars can develop new insights into how events unfold in project environment.

Framing

The sensemaking process is tightly interconnected with cognitive frames. As Karl Weick put it: "a cue in a frame is what makes sense" (Weick 1995, 53). Frames direct people's attention

to specific events and form expectations about their environment (Cornelissen and Werner 2014; Kaplan 2008). Actors' frames guide their sensemaking of the unexpected events enabling them to construct meaning in the conditions of equivocality (Kaplan 2008, Klein et al 2006, Giorgi 2017). However, unexpected events can also violate actors' existing frames and expectations that the situation is under control (William Ocasio 2009). When actors experience surprises and their expectations are interrupted because the situation presents them with unexpected cues which do not fit their frame repertoire, their sensemaking is triggered stimulating the process of regaining sense and forming a new frame (Cornelissen and Werner 2014). In other words, actors cope by reframing what is going on (Ocasio and Radoynovska 2016). Failure to modify frames in the context of changing environment may result in individuals and organizations inadequately responding to the new challenges (Kaplan 2008). Scholars have showed how failure in adapting framing of events may lead to a collapse in sensemaking with breakdown in meaning and even loss of life (Weick 1993; Ocasio 2009; Cornelissen, Mantere, and Vaara 2014).

Management scholars have shown how framing can direct actors to adopt a particular action and navigate their environment, whilst the failure to modify their cognitive frames when faced with unexpected events may lead to disastrous effects with potential loss of life (Weick 1993; Cornelissen and Werner 2014; Cornelissen, Mantere, and Vaara 2014). Scholars have also theorized the role of frames in guiding the sensemaking processes (Konlechner et al. 2019) whereby frames serve as bracketing devices for cues that actors attend to and interpret. Actors may find the unexpected events to be confusing when those do not fit the existing frame repertoire thus triggering sensemaking. As actors make sense they revise their frames in order to adapt to the changes in their environment, particularly when existing frames which guide actors' expectations conflict with the cues from the external environment contradicting their prior expectations (Gioia and Chittipeddi 1991).

Whilst the concept of framing has received significant attention in management research, its role in project management has been studied to a lesser extent. This is surprising considering that major topics in project management such as failure, risk and crisis implicitly entail the notion of framing and offer a fertile ground for examining the role of framing in managers' decision making and action prior to, during and after the surprising events occur. Furthermore, studying the role of framing in managers' expectations surrounding project implementation and how managers cope with ambiguity and changing conditions can help scholars better understand how actors construct their project environment which in turn shapes managerial responses in project failure or crisis situations.

Scholars have examined the role of managerial framing of project risks and benefits as a mechanism to shape decision-making and action among project stakeholders under uncertainty (Chapman 2006; Martinsuo, Korhonen, and Laine 2014; Martinsuo, Vuorinen, and Killen 2019) and problem-solving in project contexts (Yeo 1995). These insights are helpful to understand how managers frame risks and legitimate their project intentions given the uncertainty of future outcomes. However, these studies foregrounded early stages of project design and emphasized the role of framing to reduce a sense of uncertainty. Our understanding of how frames change over time after a project commences is limited. Purdy et al (2019) suggest that studying framing allows researchers to develop perspectives of micro-level dynamics of managers interpretations of events and how they cope with complex and dynamic conditions in their environment.

Empirical Setting and Method

This research addresses the question of how managers make sense of and frame events to adapt to changes in a project context. Guided by the process ontology, our study adopted a prospective longitudinal orientation (Cloutier and Langley 2020) which allowed us to account

for the dynamics in how actors experienced events within a bounded project setting and how their framing and sensemaking of the events evolved over time. Through abductive approach, we moved between what the research participants reported in the interviews and the extant literature which offered us a wide range of sensemaking forms and constructs (Maitlis and Christianson 2014). Thus, we relied on a systematic combination (Dubois and Gadde 2002) to explain, develop, and change the theoretical framework in an iterative manner. In other words, following an abductive approach, we have been seeking the best plausible explanation of the sensemaking processes and the actors' temporal orientation in sensemaking by combining the empirical observations of the phenomenon and context with the existing theoretical understanding of sensemaking.

Context

The context for our study is a large project which combined two streams (simply referred to as Stream A and Stream B) with the aim of developing and implementing a company-wide technology. The outcomes in each project depended on the other and were considered of strategic significance by senior managers because of the potential significant ramifications for the company if the intended outcomes were not accomplished. A project stakeholder summarized the significance of the project as *“if we get it wrong... it may cost between £800 million and £1 billion”*. This project was commissioned by a multinational original equipment manufacturer (OEM) based in the UK, which we refer to as Apexforce. Managers at Apexforce commissioned *Gadgetron Delivery*, a major information technology services firm, to develop and implement a new technology. In order to accomplish the objectives of the Stream A, *Gadgetron Delivery* worked with *Wayne Subcon*, a subcontracting firm, which owned an existing technology but required customization for Apexforce. At the same time, *Gadgetron Delivery* also worked with *Ziff Subcon* to implement Stream B to develop and implement a new technology.

The significance of this context was both empirically interesting and theoretically puzzling because of the challenges posed by the unexpected events in how actors make sense and frame events in the context where they attempt to anticipate and respond to the unexpected events in the project environment. These events were considered significant enough by the project stakeholders to undermine their ability to accomplish project objectives and thus result in major financial and reputational loss. Specifically, this context allowed us to study how unfolding events entailed actors engaging with different forms of sensemaking and how they related to the framing of the events as they unfolded.

Data Elicitation

The participants in our study were key decision makers involved in managing the project and were concerned with the events throughout the duration of the projects. In line with the prospective longitudinal processual orientation, we conducted interviews with 18 participants over a period of 18 months consisting of 5 interview rounds (see Table 1). The size of the interview pool was adequate to elicit both individual and construct a collective view of the participants' experience of change in the context of a large project. The intervals between the interviews provided time for the new events to develop and allow the actors to take stock of the key events that had happened which became the basis for their storytelling. In total, we conducted 62 interviews, each lasting between 1 and 3 hours. Due to the intensity of project implementation and time constraints experienced by the study participants, we were not able to interview all of them during each round. However, we conducted an adequate number of interviews for analysis and theorizing.

Organisation	Project A	Project B	Both projects
Apexforce			1 x Account executive
	1 x Relationship manager	1 x Relationship manager	

	1 x Project manager	1 x Project manager	
			1 x Project Management Office director
			2 x Project manager
	1 x Solution specialist	2 x Solutions specialist	1 x Solution specialist
Gadgetron Delivery	1 x Project manager	2 x Project managers	
	1 x Solution specialist		
Wayne Subcon	1 x Project manager		
Ziff Subcon		1 x Project manager	

Table 2: Research participants and their role titles

Our interview questions focused on the managers’ lived experience of events and their understandable meaning of such experiences (Moustakas 1994). In order to extract the sensemaking process and their associated temporal orientation, we relied on a narrative interview technique (e.g. Giezen 2012). In a first step, we asked the respondents what had happened since the last time we conducted the interviews with them and to describe how the new events unfolded in as much detail as possible. The respondents were encouraged to tell their stories in detail. Once the interviewees finished telling their stories, our questions concentrated on the meaning they ascribed to the events they deemed salient. For example, the researchers relied on laddering questions (e.g. Miles and Rowe 2004) such as “*In what way is this [observation of an event] significant to you?*” or “*What does that [observation of an event] mean to you?*”. Following the participants’ narratives and asking them to discuss the meaning they assigned to the events, allowed us to elicit their sensemaking processes and the framing they associated with particular events or sets of events.

Data Analysis

Our data analysis was guided by Langley’s (1999) notion of analyzing process data and steps of abductive inferences suggested by (Richardson and Kramer 2006). Our five round interview

process provided a temporal decomposition by separating 62 interviews into five rounds (see Table 2).

Interview rounds in project streams A and B					
Rounds	Round 1	Round 2	Round 3	Round 4	Round 5
Activities	Planning, designing, configuration, rollout planning, testing communication and initial deployment	Uncovering of issues, concerns and challenges encountered in the execution of a project e.g., through audits, and design workshops	Increase in intensity of activities, including the revision of planning horizons	Rearrangement of project parameters or partnership arrangements	Evaluation of project success
Approximate duration in Project A	5 months	2 months	7 months	3 months	1 months
Approximate duration in Project B	8 months	4 months	5 months	1 month	1 month

Table 3: Temporal decomposition of project A and B

To reveal the categorization of ascribed meaning to an event, we relied on a closed card sorting procedure (Cooke 1994). Verbatim statements associated with an ascribed meaning to an event which was transferred onto A6 cards. Overall, 136 meaning cards (see Figure 1) were extracted from 62 interviews. We grouped the cards based on the five interview episodes to maintain the flow of the events and stories.

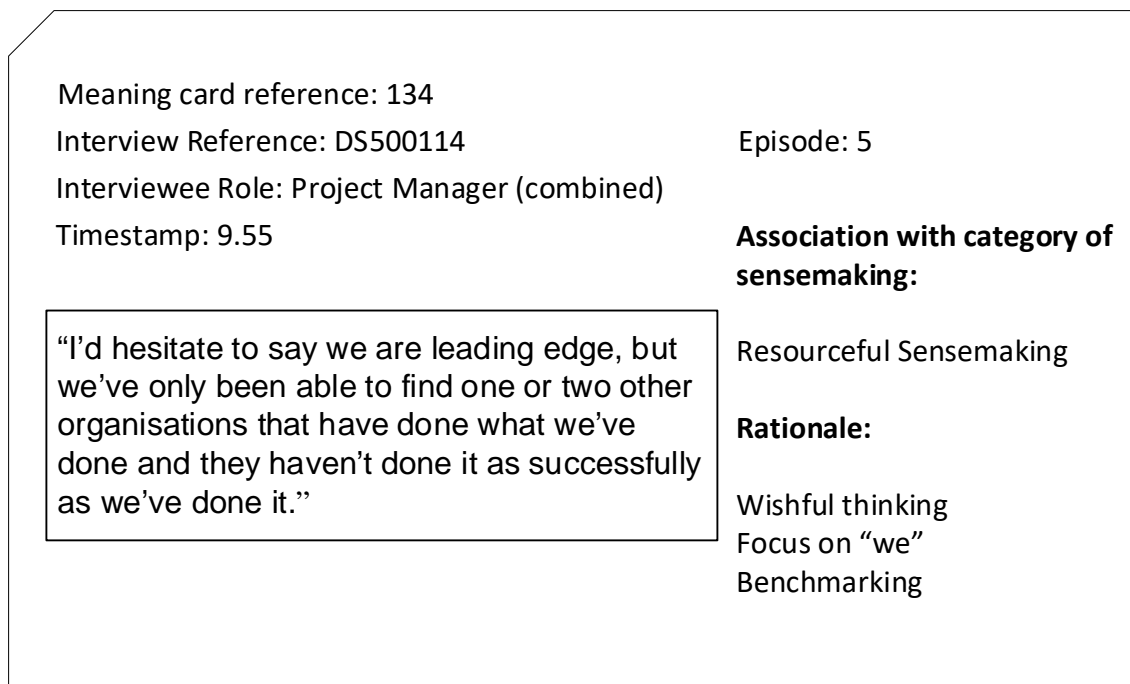


Figure 1: Example of a meaning card

Two research teams of two people each received a list of categories of sensemaking processes were extracted from the literature (Maitlis and Christianson 2014). First, each team allocated the same set of meaning cards to an existing primary and secondary category. Where no primary or secondary allocation to an existing category was possible; those remained unclassifiable. Both teams' results were tabulated, and the reliability of both categorization processes was established and shared. The first round of categorizing all concept cards resulted in a reliability score of 62%.

Second, all meanings cards, from both teams, were then mapped to the established timeline. The two sets of mapped, categorized, and timeline meaning cards were then shared among the members of both teams. A master visual map was created with agreed similarities and dissimilarities of categories of sensemaking processes and their associated temporal orientation in an iterative process. This process increased the reliability score to 71%.

Our analysis revealed five episodes of different sensemaking forms emerging over time which correspond with different phases of actors working through project implementation.

Results

Our results are structured based on the five episodes of how collective sensemaking evolved from one form to another and altering cognitive frames in chronological order: sensegiving, sensebreaking, sensedemanding, sense-exchanging and resourceful sensemaking.

Episode 1: Sensegiving and forming of the manageability frame

In the early stages of both project streams (Episode 1), the managers at Apexforce were seeking to establish “*a workable level of uncertainty and equivocality*” (Weick 1969, p. 40) about the future outcomes being accomplished as expected. This was evident in the interviews, where the project managers at Apexforce emphasized accomplishing a sense of predictability and reducing equivocality through developing precise estimates of project outcomes. During this episode, the managers at Gadgetron Delivery worked to reduce equivocality by emphasizing aspects that reflected the notions of being able to accomplish project parameters set by the commissioning managers. Managers at Gadgetron Delivery were giving sense by emphasizing the future prospect of success through reference to possessing the necessary technology and experience.

Further, the participants across both projects alluded to the existing software and infrastructure platforms supplied by Gadgetron, Wayne and Ziff as “off-the-shelf”, signifying that they worked with a technology which existed prior to the commissioning of the project. In addition, the project managers were referred to as possessing experience in implementing this technology in other organizations. This combination of the availability of the required technology to implement a large project with a history of implementation in other organizations acted as components of sensegiving among the project stakeholders, reducing their sense of equivocality about future project outcomes.

In this episode, we notice how sensegiving acts as a mechanism to reduce a sense of equivocality and facilitated a *manageability* frame among the commissioning managers that

the outcomes can be accomplished in the future as expected. The manageability frame was characterized by both setting the project outcome expectations among the commissioning managers and reaffirming that those expectations can be successfully met by the managers at Gadgetron and its subcontracting agencies. In this episode, the participants' views and experiences described in the interviews reflected the notions of skillful agents being able to accomplish their outcomes as intended. Furthermore, this was reflected in discussing future events as things that could be anticipated and mitigated throughout the life of the project given managers' know-how and technological capabilities.

The workable equivocality (Weick, Sutcliffe, and Obstfeld 2005) among the Apexforce managers is being accomplished by constructing frame that signifies that project can be accomplished as expected. This formation of the frame corresponds with sensegiving evident in managers' talking about experiences and capabilities. Despite the occurrence of new events in the initial stages of the project, they were deemed as manageable and unambiguous about their effect on the future outcomes.

Episode 1	Forming manageability frame			
Predominant personalization of event	Interpretive task	Events	Frame	Illustrative quotes
“What is a prescribed meaning of an event that provided <i>us</i> with manageability”	Affirming success	No particular significance	Manageability frame is formed	“ <i>So, the master schedule I’ve had from day one, this one has shown very clear phases.</i> ” (Project manager, Gadgetron Delivery)
	Parameters are manageable	Manageable		“ <i>I’m then going to go through, solution development. I’m then going to go into pilot. And then I’m going to go into deployment, phase one deployment, phase two deployment.</i> ” (Solution specialist, Apexforce)
	Clarity of action			“ <i>... end of October and they were like, “We want that date. That’s fine.” And as we started working towards that ...</i> ” (Project manager, Gadgetron Delivery)

Table 4: Giving sense and formation of manageability frame

Episode 2 – Sensebreaking and questioning of the manageability frame

The transition from Episode 1 to Episode 2 was characterised by the emergence of multiple minor, but noticeable, events when project participants piloted their ideas. As the project moved into the initial implementation, new events unfolded over time which project managers noticed and bracketed. Initially these events were seen as of no particular significance. However, as the events began to rapidly accumulate into a cascade of errors affecting their intended immediate project outputs and deviating from their original expectations, managers began to pay more attention to them. Project participants referred to these events as surprising and unexpected.

The resulting delays in some of the project outputs and the projected increased costs violated managers' expectations directed by the manageability frame. A project manager at Ziff Subcon stated that:

"Accumulation of lots and lots of small events that gradually eat away at the rate of progress and at the rate of spend of the project... Once you get a delay, you inevitably get overspend because you're typically keeping a team running."

This accumulation of new and unexpected events described by project managers violated their expectation that the future outcomes could be attained as expected with the available repertoire of technology and experience within the project team. As events unfolded, the sense that the project can be adequately managed into the future as intended came into conflict with the established manageability frame formed in Episode 1. This was characterized by confusion among the project participants and triggering of sense-breaking.

The sense-breaking process was characterized by managers reflecting on their experience and questioning their previously formed expectations that events could be anticipated and the

projects outcomes were under control. Further, we observe how project managers reflect on and revise their own prior sensegiving efforts, as captured by a project manager at Gadgetron:

"I think we fool ourselves and our customers about the level of accuracy at our estimates at the start of most projects... We might be better off trying not to pretend that we can because we set expectations at the start of a project that we almost, invariably have to break before we get to the end."

However, the breaking of the manageability frame was not a uniform experience among the project members, and each showed a different degree of concern. Whilst some of the managers were prepared to challenge the original framing that events could be foreseen and managed, we notice the persistence of the manageability frame among others. Despite some managers questioning the dominant frame, we noticed that at a more collective level there was still persistence of the manageability frame and no clear collective effort to abandon it. Whilst individually managers were grappling with 'what is going on here?' and 'what does this mean?' (Weick, Sutcliffe, and Obstfeld 2005), collectively no coherent view was formed on what to do.

The cues managers discussed pertained largely to the unexpected events and did not fit their existing frame thus triggering sense-breaking as their experience did not adequately fit the existing frame (Table 5). At first, managers could not articulate who could be responsible for what was going on in view of the new events, however subsequently project managers began to put blames on specific groups for failing to anticipate and adequately account for the potential events. Managers' reports suggested that events should have been expected and foreseen. In this episode, the manageability frame persists in guiding actors' bracketing and interpretation of the cues resulting in collective confusion.

Episode 2	Questioning of manageability frame			
Predominant personalization of event	Interpretive task	Events	Frame	Illustrative quotes
"What has the failure to manage the event meant to me?"	Breaking	Events accumulate leading to disruption of expectations	Manageability frame is questioned	<p><i>"First of all, our requirements are sound. It wasn't a case of us changing our mind of what we wanted and, therefore, [Ziff Subcon] not being able to keep pace with our changing requirements. No, the requirements were sound. Against the original requirements, they hadn't delivered a solution that worked."</i> (Project manager, Apexforce)</p> <p><i>"The customer introduces far more things into scope and risk requests are forever coming in. They don't actually know what they want."</i> (Project manager, Gadgetron Delivery)</p> <p><i>"They accept that they were sold a pup by Wayne Subcon, right. And it's nothing to do with what [Gadgetron Delivery] have deployed or anything to do with the infrastructure"</i> (Project manager, Apexforce)</p>

Table 5: Breaking sense and questioning of manageability frame

Episode 3 – Sensedemanding and the collapse of the manageability frame

With the manageability frame now questioned, the project participants attempted to work out 'what's next?' (Weick, 1995). The accumulation of challenges that were threatening the project implementations, eventually resulted in a formal recognition of the issues and Apexforce launched a formal audit. The report produced by the auditors suggested that the project experienced series of deviations from the original plans, including time specific delays, incurring unplanned costs and concerns around the quality of outputs. The launch of the audit reflects a key aspect of sense-demanding as managers attempt to construct meaning of the events. In addition, the stories told by the research participants suggested that the manageability frame had collapsed with a shift from sense-breaking to sense-demanding.

Whilst the Apexforce managers were concerned about the future of the project outcomes, their sense-demanding emphasized past experience and events. Managers' attention was directed to the unexpected events which violated their expectations. The participants have not worked out yet what to do next. During the interviews they reported ongoing frustrations with the current state of the project and conflicting accounts over how to proceed next. The intensity of the demand for sense among the Apexforce managers became of concern to Gadgetron Delivery where the managers started to consider terminating the project contract as the most sensible action.

This “*breaking down of meaning*” (Pratt 2000) and of the initial frame meant that the managers are now searching or demanding a new sense (see table 6) in their attempt to answer the questions ‘what is going on?’ and ‘now what should we do?’ (Weick, Sutcliff and Obstfeld 2005).

Episode 3		Collapse of the manageability frame		
Predominant personalization of event	Interpretive task	Events	Frame	Illustrative quotes
"What is a workable meaning of an event that will provide us with a mean of recovery from failure?"	High degree of equivocality	<p>Unforeseen in advance</p> <p>Visible as the project unfolds</p>	<p>Manageability frame is abandoned</p> <p>Start of search for new frame</p>	<p><i>"We found problems, we'd get a fix, found more problems, get another fix. Well, how long can you continue like that?"</i> (Project manager, Gadgetron Delivery)</p> <p><i>"Now, today, as in right now, could [Apexforce] easily turn round to [Gadgetron Delivery] and say right we are fed up with you, goodbye, go away? Yes, we could, and the likely outcome would be, significant disruption of projects, they would probably stop for six months to a year, significant, potentially significant impact on services."</i> (Relationship manager, Apexforce)</p> <p><i>"It got so bad, there were so many escalations into the Head of Engineering that the Chief of [Project B] decided we needed a tiger team with the technical boys."</i> (Project Manager, Apexforce)</p>

Table 6: Demanding sense and collapse of manageability of frame

Episode 4 – Sense-exchanging and forming attentiveness frame

The collapse of the manageability frame in Episode 3 encouraged the project members to form a new frame that will direct how they make meaning of events. Participants reported grappling with how to work together to enact a sensible environment and in Episode 4 sense-exchanging becomes a key form of sensemaking enabling project managers to move forward differently. Sense-exchanging is characterized by actors attempting to bring disparate meanings together and manifested through managers acting to translate multiple realities towards a negotiated position to enact a sensible environment.

Following the audit report, project participants began reconfiguring their processes and procedures to help them move the project forward despite the new events continuing to appear and challenging their modus operandi. One manager described their experience as a prolonged phase of “*fire-fighting*”. Episode 4 is characterized by a formation of a new frame. During this stage in project implementation, the notion that available technology and managers’ prior project experience were adequate to accomplish the desired outcomes is being replaced by the frame that required a more sensitive attention to the events. Contrary to the previous expectation that events can be actively dealt with, there is greater attentiveness to the ongoing events and new accountability mechanisms. A project manager at Ziff Subcon described the new processes as that demanded all project sides to be aware of what was going on:

You have to go to various boards... It's all multi-sited, so each site talks to each other.

We've had to introduce so many firewall risks.

The new developments in project implementation reflects an evolution of a new frame and a sense of how to move on in the context of shifting environmental conditions (see Table 7).

Episode 4	Revaluation			
Predominant personalization of event	Interpretive task	Events	Frame	Illustrative quotes
"What is a workable meaning of an event that will provide us with manageability?"	Exchanging various interpretations to reduce equivocality	Foreseen as project unfolds	Collective attentiveness is forming	<i>"Having done that, we're on a solid footing throughout the rest of the programme. So that probably mitigated it."</i> (Project manager, Gadgetron Delivery)
		Heedful attention		<i>"Actually they run quite well and could be transitioned quite easily; a great deal of heart ache whilst [Apexforce] found somebody else to partner with, and in all probability, it wouldn't be a someone, it would be a group of someone."</i> (Relationship manager, Apexforce)
				<i>"Because we have to collaborate with all of them and they need to be talking to each other, as well me liaising with all of them and sometimes that's not the case. Sometimes you have leverage groups that just do what they're told..."</i> (Solution specialist, Gadgetron Delivery)

Table 7: Exchanging sense and forming attentiveness frame

Episode 5 – Resourceful sensemaking and attentiveness frame established

As the project came to a close, managers deemed the outcomes as satisfactory. Despite not meeting the cost and time targets, *"35% over budget and 50% over time"* as stated by a project manager, the overall outcome was deemed accomplished. In Episode 5, the project participants emphasized a new narrative constructed of commonality and mutual sharing as was evident in expressions such as *"working to a common goal"* (Solution Specialist, Gadgetron Delivery), *"schedules with a jointly run plan"* (Project Manager, Gadgetron Delivery), *"sharing risks and opportunities"* (Relationship Manager, Apexforce), and *"working as a team"* (Project Manager, Wayne Subcon). This vocabulary signaled a change not only in how managers intended to work together, but also reflected a new frame in how they coped with ongoing events.

The new frame was characterized by sharing responsibilities and attentiveness to the environmental dynamics rather than seeking reduction of uncertainty and holding a particular party accountable for the project deviations or not foreseeing events. The establishment of the new attentiveness frame was supported by working through unexpected events by distributing responsibilities among the stakeholders. This was further reflected in a renewed set of collaborative practices. The new frame of attentiveness to the changes and distributed responsibility is juxtaposed to the original frame where events were expected to be managed and accounted for by specific actors.

The sense-exchanging processes in Episode 4, whereby project participants attempted to negotiate a new meaning of events and working out ways of working together, evolved into resourceful sensemaking in Episode 5. Within the project, managers' resourceful sensemaking focused on accomplishing collaborative processes and practices and aligning all stakeholders by accounting for the perspectives of others. Enacting environment when surprising events occur is no longer considered a responsibility of some stakeholders, as was the case with the manageability frame, but a collective action of all stakeholders.

Episode 5		Attentiveness frame is dominant		
Predominant personalization of event	Interpretive task	Events	Frame	Illustrative quotes
"What has the management of the event meant overall to us"	Appreciate the views of others Sharing responsibility	Unexpected events are a norm	Collective attentiveness is dominant	<p><i>"We've only been able to find one or two other organizations that have done what we've done, and they haven't done it as successfully as we've done it."</i> (Solution specialist Gadgetron Delivery)</p> <p><i>"This is a programme that has been a game-changer for [Apexforce]. It has been very successful indeed. Yes, it's late, yes, it's over budget, but look at the benefits we have delivered and look at what we have enabled within the business, is huge."</i> (Account executive, Apexforce)</p>

Table 8: Resourceful sensemaking and established attentiveness frame

In Figure 2, we have summarized the key features of the episodic events in sensemaking that occurred through the life of the project. In this diagram, we have summarized the triggers for sensemaking, the key sensemaking construct we identified at each stage as well as the shift in temporal ontology.

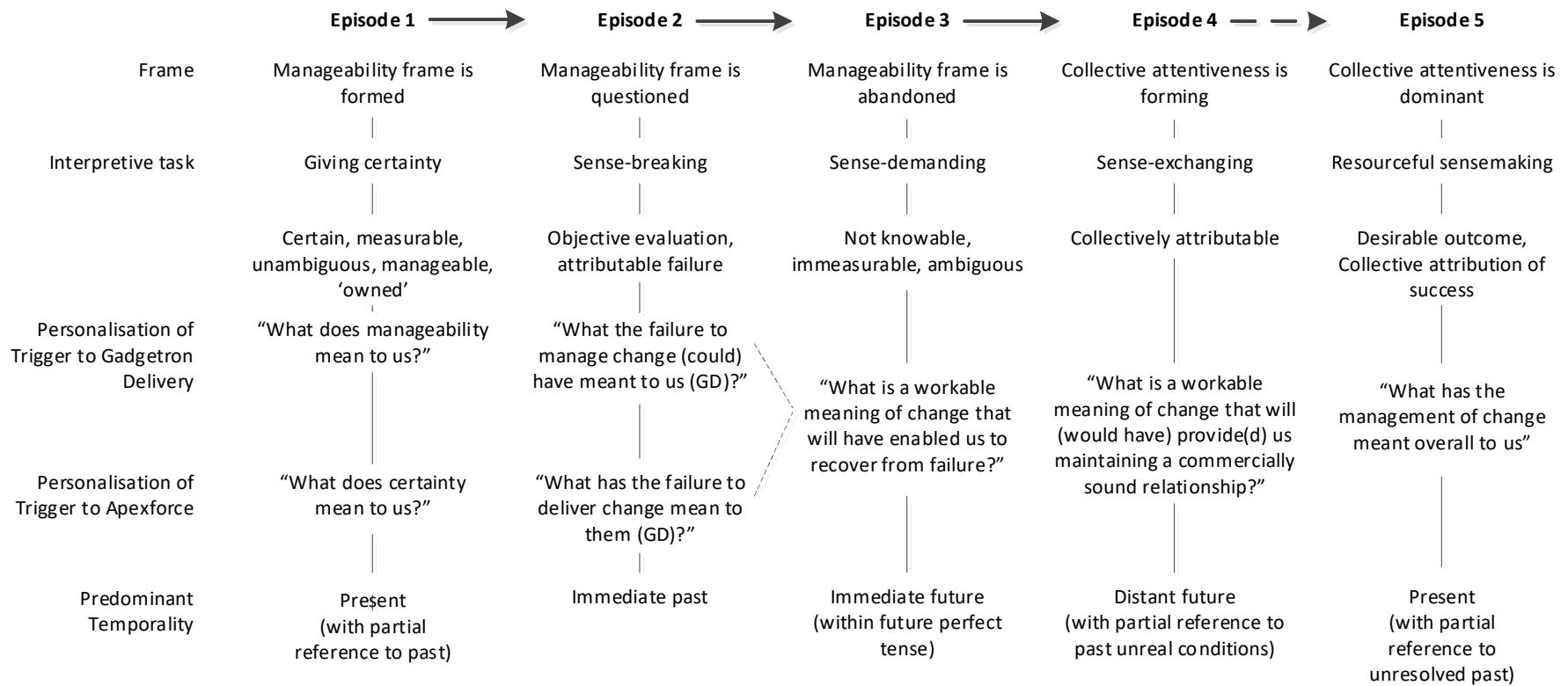


Figure 2: Episodic sensemaking of events

Epilogue: sense-abandoning

In the final round of interviews, we notice that at the end of the project as the participants spoke the future actions outside the project, they alluded to managing projects in similar vein to the manageability frame. For example, a project manager at Gadgetron referred to their future plan as *"we need to invest more at the beginning and say, 'right we need to have proper plans, proper scope". You know, taking basic project management into account, to me requirement is what the customer desires, scope is what we deliver."* Similarly, a project manager at Apexforce stated that *"I suppose what you ought to be able to do is plan an iteration of a fix and then you make the planning assumption that there'll only be one iteration or two iterations of that and you could plan those then."* This points to reappearance of the manageability frame despite managers' experience of having to break from it early in the project and work towards a new and juxtaposing frame to bring the project from the brink of collapse.

Despite the shifts which entailed the breaking of the manageability frame and the subsequent emergence of the shared responsibility frame, actors did not seem to have fully abandoned their initial frame. We refer to this as sense-abandoning – akin to the organizational amnesia which draws on the organizational memory literature (see, for example, Casey and Olivera 2011). We see sense-abandoning as an act whereby actors having formed a new temporary frame which guided their sensemaking and enabled them to cope with the surprises and challenges in their environment, they nonetheless return to the frame from which they started. Whilst we do not see the evidence of the manageability frame being readopted at the end of the project, it appears to be projected into the future projects.

Discussion

We extend the discussions on how project managers cope with unexpected events by examining the role of sensemaking and framing processes during changes in the project conditions. Our study contributes to theoretical discussions on how cognitive frames and sensemaking interact over time by highlighting how actors transition from one form of sensemaking to another as they attempt to construct their environment in view of unexpected events. Specifically, we expand scholarly conversations on the role of framing in project management by examining managerial frames beyond the initial phases of project planning and instead examine how they evolve during the entire project lifetime. In addition, we show how over time actors implementing a large project adopt different forms of sensemaking in their attempt to form and reform their frames enabling them to adapt to changes in their environment.

Projects are spaces where managers commonly experience unforeseen and unexpected events which they need to attend to and work out how to respond to the ongoing flow of new developments that contradict their prior expectations (Soderholm 2008, Aaltonen, Kujala, Lehtonen, Ruuska 2010). Such events may disrupt project implementation entirely or require reconfiguration of the costs, timelines or scope of work initially planned (Pavlak 2004; Pich, Loch, and De Meyer 2002). The notions of project failure and managing project risks are inherently about coping with unforeseen and unexpected events, hence understanding how project stakeholders cope with the changes and reconstruct their project environment requires further examination.

Managers experience multiple episodes of frame configuration when implementing projects where they are faced with unexpected events: initial forming of the frame at the start of the project; questioning the frame when experiencing unexpected events; abandoning the frame;

reworking the frame and reconsidering how to implement the project; new frame formed, and project arrangements are stabilized. Over time these episodes correspond with different sensemaking processes that enable actors to form and reform frames. This process of altering the frame required actors to adopt different forms of sensemaking over time (see figure 3).

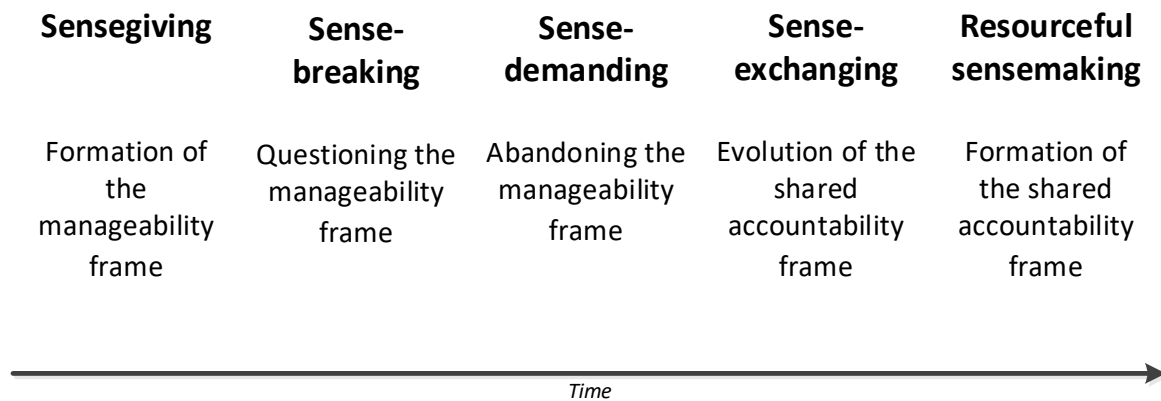


Figure 3: Forms of sensemaking and modifying frames over time

Prior studies examined how managers frame projects in the early stages to convey the prospective value of their projects (Martinsuo, Korhonen, and Laine 2014; Martinsuo, Vuorinen and Killen 2019) and reduce a sense of uncertainty inherent in the project design (Chapman 2006). The early stages can be characterized by managers’ interests for projects to materialize and succeed thereby emphasizing sense-giving processes and constructing a frame that projects can be managed as expected. These early sensegiving efforts that shape frames that the project can be managed as expected can subsequently fire back. The complex reality of large projects is not only that the conditions in the project environment change thereby threatening the initial framing that risks can be managed and benefits reaped, but also pushing the same managers who worked to reduce a sense of uncertainty in the beginning to the point of actively considering of pulling the plug on their project because their, and their stakeholders’, expectations become violated.

In the beginning, the initial frame formation is guided by managers' expectations and the parameters set for their project. These parameters serve as cues for other stakeholders to give sense to reduce a sense of uncertainty whilst also affirming the expectations, thereby forming the initial shared frame. Managers' expectations are violated by the emergence of unexpected events that alter the course of project implementation prompting them to question the adequacy of their frame and engage in sense-breaking. At first these contradictory cues may present as weak signals (Weick, Sutcliffe, and Obstfeld 1999), particularly if they do not significantly conflict with the existing expectations thus may not be triggering sensemaking at once. However, accumulation of such cues over time may trigger sensemaking prompting actors to question their frames. Individual sense-breaking evolves into a collective sense-demanding and the questioning of the frame leads to abandoning the frame as it no longer makes sense in light of managers' experience of the project implementation.

As the extant literature suggests, when people's expectations are violated, they engage in sensemaking and attempt to form a new frame (Cornelissen and Werner 2014, Maitlis and Christianson 2014). This is evident in our case; however, we also note that given the high profile of the project, managers engage in intense process of sense-exchanging to actively rework their frame. Revision of their frame becomes necessary to work out the way forward to adapt to the changes in their environment. In contrast to the initial frame which was based on the expectations of how the project should work, a new frame reflects managers' actual experience of their project environment. The new processes reflect the need to be collectively attentive to the reality that environment evolves, and new events may contradict the project plans. This is enabled by the resourceful sensemaking where actors account for the perspectives of others (Wright et al. 2000) as they enact their environment.

Prior work examining the role of sensemaking in project management has shown how stakeholders form a shared understanding of their common interests as necessary aspects in

accomplishing their project goals (Jenkin, Chan, and Sabherwal 2019; Brunet and Forgues 2019). This is also evident in our case, whereby stakeholders form a shared view at the start of the project through sensegiving process and later on through sense-exchanging. Yet the common goals formed early in the project through sensegiving can be threatened by the unexpected events and reveal the disparities among the actors. Sense-breaking and sense-demanding may result in the decoupling and confusion among the stakeholders. The resulting divergence among the actors may push the project to the brink of collapse. Sensemaking processes not only enable actors to come together but can also pull them apart. Whether actors within a project converge or diverge in part hangs on how they work through their frames.

Whilst sensemaking processes enable actors to alter their frames in the environment with multiple surprising events, they did not fully abandon their initial frame. We refer to this as frame-abandoning because whilst at the end of the project the manageability frame was no longer a dominant frame, as actors gazed into the possibility of managing future projects, they emphasized the significance of aspects which constituted the manageability frame. When faced with new challenges actors may form a new but temporary frame which enables them to grasp and enact their environment whilst the initial frame may remain latent. Thus, abandoning the newly formed frame maybe necessary as a temporary measure to cope and adapt to their environment.

Practical Implications

Understanding managers' lived experiences of the surprising events and changes in their complex environments helps scholars consider what tools and techniques might adequately support them in the challenging work of managing large projects (Alderman, Ivory, McLoughlin & Vaughan 2005, Gacasan & Wiggins 2016). The joint interplay between sensemaking processes and project management tools and techniques may result in blind spots (Maitlis and Sonenshein 2010), and thus blind project managers to contradictory cues

(Nickerson 1998). In this study, strong, optimistic constructions of events that reinforces a frame of normality and control were observed in Episode 1 of the studied projects, and this frame remained unchanged until the emergence of unexpected events with adverse consequences to the progress of the projects.

The phase of reconfiguration and reconstitution in Episode 5, which took place at the phase of the closure of the projects offered, in the light of setbacks, an opportunity for scrutinizing and challenging the process of sensemaking. Nevertheless, a similar frame was adopted to engage with events that were adopted in Episode 1, with the only difference of a temporal orientation to an unresolved past. In other words, the project managers longed for a similar frame of certainty to address the shortcomings of the frame that they gradually abandoned in the light of contradictory cues.

This dilemma (Bakker et al. 2011) of reconfiguring and reconstituting the same blind spots can be addressed by designated sense-breaking and sensegiving activities to enable project teams to identify blind spots associated with commonly occurring sensemaking processes. These sense-breaking and sensegiving activities need to be aligned with the principal premise of project management tools and techniques. For example, risk management processes, which are traditionally incorporate a deterministic and probabilistic premise, need to align with the project manager's expectations so that these tools are adopted and not disengaged from (Kutsch et al. 2012).

Conclusion

Our study shows how managers cope with new events in a project context by making sense and reframing what they experienced. Despite the proliferation of project management tools and frameworks, actors are able to cope by collectively making sense and revising their frames to adapt and move forward. We contribute to theoretical discussions of framing and

sensemaking by highlighting their dynamic relationship. Specifically, we show actors' sensemaking changes over time and enables them to modify their frames. A practical implication of this research is illustrated by human ability and necessity to adapt when new events take up by surprise. Managers can step away from their expectations formed by the pursuit of certainty and controllability inherent in many project management tools and frameworks.

Whilst we were able to construct the overall picture of how sensemaking and framing interact, our analysis was limited by a single type of data source. Future studies can probe deeper into the micro-level dynamics of how actors make sense and reframe events by adopting multiple sources of data to triangulate and enrich the data. Particularly, adopting discourse analysis can reveal further insights into how actors revise their frames using linguistic devices. The use of a single project (even if consisted of two components) meant that the sequence of forms of sensemaking may not necessarily develop in that order. Whilst we highlighted a particular sequence of various forms of sensemaking unfolding over time, we avoided theorizing that a particular sequence could be generalized. Hence, future research could explore what forms of sensemaking were triggered over time in other contexts. Finally, our context was both a strength and a weakness of the study. It provided us with an opportunity of mildly, but naturally occurring, controlled conditions where the following key aspects were bounded: participants, time, task and resources. However, generalizing this beyond project settings can be difficult because of the more open nature of organizing outside of projects.

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