

**The Titanic sunk, so what?
Project manager response to unexpected events**

Joana G Geraldi, Elmar Kutsch, Liz Lee-Kelley

Abstract

Projects are inherently uncertain and face unexpected events, from small changes in scope to unforeseen client's bankruptcy. This paper studies how project managers respond to such events and how successful and unsuccessful responses differ from the perspective of the practitioner. We analysed 44 unexpected events faced by 22 experienced project managers in defence and defence-related organisations. The project managers compared two unexpected events that they faced, one that they considered the response successful and the other, unsuccessful. We identified three pillars supporting successful responses to unexpected events: (1) responsive and functioning structure at the organizational level, (2) good interpersonal relationship at the group level and (3) competent people at the individual level. The events and respective responses analysed suggest that improvement in project management can be achieved by better managing these three pillars, allowing project and programme managers to "*create their own luck*".

Keywords: Unexpected events, perceived success, organizational response, project management

1 Introduction

The Titanic had an image of perfection. The project to design and build the largest and most robust passenger-liner in the world received much attention and admiration as an engineering feat. However the benefit realisation of the project is arguable. The superlatives sunk with the ship on its maiden voyage in 14th April 1912. The unexpected event – hitting an iceberg – could actually have been expected and avoided, yet probably considered unlikely to happen given its massive and sturdy structure. It emerged subsequently that the resources necessary to cope with the crisis were not available, which worsened the consequences of the unexpected event significantly.

As projects are inherently uncertain, they are prone to unexpected events (De Meyer et al., 2002; Huchzermeier and Loch, 2001; Sun and Meng, 2008), i.e. events that may have been predicted (or not), but are not expected to happen. When they happen, they can have a considerable impact in the project. Yet project management mainstream literature responds to this reality in a rational and deterministic way, opting for a routine-based reliability to eliminate situated human condition as the cause of errors (Pender, 2001). The conventional view is to emphasise protocols, documentation and processes as the underlying success to programme and project management (PPM). Loch et al. (2006) opines that risk and its management is too front-loaded, focusing on the tools and techniques for risk identification and their containment through active monitoring and documentation such as the risk log. Typically, risk management attempts to prevent uncertain events from materialising in the first place, by offering strategies to contain their effects if they still occur.

However, such an approach can be dangerous as Loosemore argues:

“(...) the danger is that continual advances in proactive management techniques will produce an over-reliance upon strategies of anticipation and deflect attention from the need to build resilience into organisations to deal with the unexpected.” (p. 140)

There is an increasing awareness that unexpected events will happen (Hällgren and Wilson, 2008; Söderholm, 2008; Sun and Meng, 2008). With Perrow, we argue that it is not a question of ‘if’ but ‘when’ unexpected events will emerge. In Perrow (1994)’s words,

“no matter how hard we try there will be serious accidents because of the interactive complexity (which allows the inevitable error to interact in unexpected ways and defeat safety systems) and tight coupling (in which small errors propagate into major ones) of most risky systems”. (p. 212)

Little help can be found in the project management literature on how individuals respond to unexpected events. Unlike the literature in general management, there are only a few empirical studies dedicated to preparing for and responding to such events. Exceptions can be found in studies mainly on crisis management in the construction industry (Hällgren and Wilson, 2008; Loosemore, 1998a; b; Söderholm, 2008). Loosemore (1998a; b) studied practitioners’ behaviours in a crisis and identified ‘ironies’ in which important aspects such as mutual trust are threatened or missing exactly in moments of crisis. Hällgren and Wilson (2008) and Söderholm (2008) examine the practices used by project managers to cope with unexpected events, in a

similar line as the practice approach developed in sociology and philosophy (e.g. Jarzabkowski and Spee, 2009; Schatzki, 1996).

There is also a lack of studies exploring the link between practices and success. This paper aims to contribute to this gap by examining practitioners' perceptions of how successfully they responded to unexpected events. Building on the 'ironies' identified by Loosemore (1998b), we explored the enabling conditions that will support project managers' ability to cope with unexpected events. That is, what organisational foundations are relevant to respond to unexpected events successfully?

We explored three elements: (1) the event, (2) the response and (3) perceived success. Three questions were asked, respectively: "what happened?", "what did project and programme managers do when faced with an unexpected event?" and "how did successful responses differ from unsuccessful ones from the perspective of the practitioner?" The first two questions provided us with a context of the change and participants' reactions when faced with an unexpected occurrence. The study is centred on the third question. We have deliberately located our research on perceived success of response rather than the overall success of the project for two reasons. Firstly, the overall project success is influenced by several other factors that we would not be able to control for. Secondly, we aim to understand success as seen from the viewpoint of project personnel faced with an unexpected event. We believe that our study is amongst the firsts to examine response success to unexpected events. We compare and contrast successful and unsuccessful responses to shed light on successful practices.

2 Literature review

Importance of unexpected events and their response

A project is a 'vehicle of change' including a defined scope which needs to be delivered in a defined time and at an agreed cost (e.g. APM, 2006). Projects are characterised by, among others, its uniqueness and inherent uncertainty; each differing from the other in some respect (e.g. APM, 2006; Maylor, 2005; PMBoK, 2004). Given project management's scientific management inclination, it is not surprising that systematic responses have been developed in the form of risk management standards to provide order and predictability (Chapman and Ward, 2002; Ward and Chapman, 2002a; b). Hence, the purpose of risk management is to assess and manage uncertainty in advance - to define responses to risks that may have a future adverse impact on the project outcome before they materialise (Chapman and Ward, 2002). Invariably, risk management is reliant on hindsight as a predictor for future risk events.

Although risk management seeks to identify much of the variations and provide for their mitigation, it is simply impossible to totally de-risk a project. De Meyer et al (2002) claim that projects face a continuum of unexpected change varying from simple variations (or aleatory uncertainty) to chaos (or epistemic uncertainty), as shown in the left side of Figure 1. On the one side sits aleatory uncertainty which refers to chance and describes a random process. Throwing a dice often enough enables a decision maker to define outcome probabilities of one side of the dice showing up. We are uncertain about the number we will receive, but we are sure that each of the numbers will occur with a probability. The distribution of probabilities (chance) would not change unless the dice itself would change its shape. Changing its shape, the dice would have to

be thrown repeatedly in order to generate knowledge about the new distribution of chances. Hence simple variations in a well-defined and planned project, such as rain in the British Autumn can ground a construction project to a halt. Alternatively, the project team may forget a detail, make wrong calculations, etc; or, as the expected utility theory claims, they may decide that the benefit realised by avoiding the risk is lower than the effort or cost necessary to avoid it (Arrow, 1983; Borge, 2001; Kahneman and Tversky, 1979).

On the other end of the continuum, ‘chaos’ is involved in exploratory projects, such as the development of new drugs in the combat of a disease. This extreme faces epistemic uncertainty. Epistemic uncertainty results from gaps in knowledge. For example, one may be uncertain of an outcome because one has never used a particular technology before. In many contexts, managers remain ignorant. Aleatory and, in particular, epistemic uncertainty, demand that we have to try and make sense of incidents when they happen as unexpected events. Uncertainty in projects means that managers’ predictions such as the probabilistic conclusions about future risk are only ‘best guesses’ and cannot be relied on unquestioningly (Frosdick, 1997; Pender, 2001).

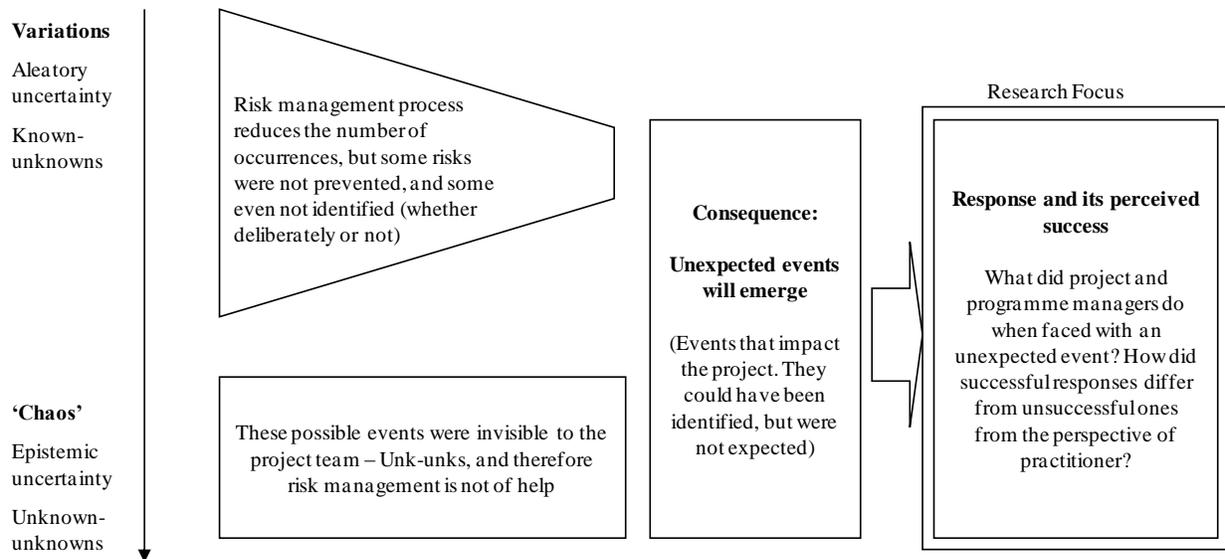


Figure 1: Focus of the Research

Unexpected events: What are they?

Notwithstanding project managers’ efforts to predict all possible risks in projects, there are always residual uncertainties (as illustrated in Figure 1). Unexpected events for the purpose of this study are the outcome of a range of residual uncertainties that can threaten the viability of a project (see Figure 2)

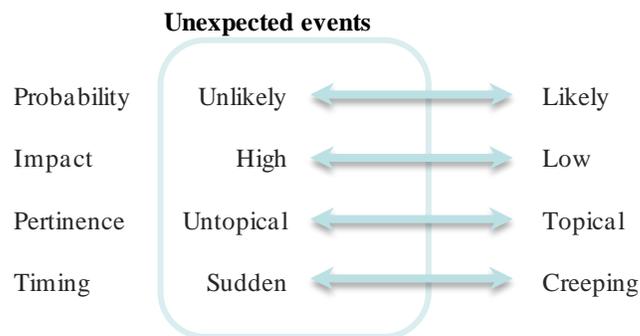


Figure 2: Differentiating aspects of unexpected events

Literature often refers to unexpected events as low probability, high impact situations. Yet, this does not necessarily mean that the event is purely unforeseeable or unknown (Pich et al., 2002). Recent research has highlighted the aspect of attention; managers concentrating on some features of the environment to the (relative) exclusion of others (Weick, 1995). In general, they learn to concentrate on what is critical in their experience with the domain at hand and disregard any other events. Reasons for the lack of attention are manifold but the cognitive exclusion of these possible events creates the effect of a surprise. Despite being knowledgeable about the risks in a project, they elect to shelve some under the rationale, 'it will not happen to me'. For example, public and relevant statistics are available to help us make a reasonable judgement about the likelihood of been injured in a car accident. Having subconsciously decided that 'it will not happen to me', we continue to drive our cars. Therefore, when an actual car accident occurs, we are surprised because the actual threat was not conceived pertinent at the given point in time.

Although the probabilistic, normative 'management by planning' approaches such as risk management suggest that uncertainty can be well planned in advance, we have incomplete knowledge about how projects will unfold (Pender, 2001). It is inevitable that unanticipated events will occur in projects, requiring a time-pressured response (Hällgren and Wilson, 2008; Loosemore, 2000) and calling for a 'management by organising' project management paradigm (Williams, 2005). As responding to unexpected events is a fundamental function in project management, participants in this study were asked to think of examples of 'significant unforeseeable events' which took the project manager and his team 'by surprise', whether these were effectively unknown, unpredicted or merely residual risks that materialised.

Responding to unexpected events and the impact on success

Studies especially within crisis management explored a) individual, b) group and c) organisational responses to unexpected events. These are summarised in Table 1.

Individual behaviours in a crisis are widely researched, especially within psychological research. Many of the studies were looking at how people behaved when faced with catastrophic events such as Tsunamis, earthquakes or war. In the organisational context, researchers conclude that “cognitive limitations are inherent in individuals and that organization-based solutions constitute the primary method for overcoming or minimising these limitations” (Pearson and Clair, 1998).

Responses at the group level encompass practices based on interactions among stakeholders internally and externally, such as negotiations. The majority of studies in the project management literature are located at this level. Organisational level responses regard broader activities and organisational culture in preparing individuals to cope with unexpected events as they materialise. Some organisations are well equipped able to cope with unexpected events while responses from others can worsen the situation (Carmeli and Halevi, 2009). Commentators debate on the ‘best’ way to respond to a crisis but lack empirical validation. Empirical studies in the project management context identified responses that took place in companies but did not evaluate whether these were perceived as successful or not (see Table 1). The scant attention on individual perspective of responses to unexpected events prompts this project.

Table 1: Literature on practices related to unexpected events

	<i>Focus</i>	<i>Source</i>	<i>Methodology</i>	<i>Responses</i>
Project context	Individual and group level	Loosemore (1998a)	Case studies in construction projects	Preconceived beliefs and attitudes, level of uncertainty surrounding financial responsibility and pressure
		Loosemore (1998b)	Case studies in construction projects	Necessity but usual lack of team work and collective responsibility, effective communication and mutual sensitivity between project members
	Group and organisational level	Söderholm (2008)	Four case studies of different project types in different industries	Most used practices were: Detaching strategies, setting up intensive meeting schedules and negotiating project conditions
		Engwall and Svensson (2001; 2004)	Three case studies in product development projects	Cheetah organisations: Abrupt emergence of ad hoc organisations composed to solve unexpected problems. They are explicitly sanctioned, have full-time members, are action-oriented – accomplish a specific mission, and are smaller and more time limited than usual temporary organisations (the duration varies from 3 to 8 weeks).
		Hällgren and Wilson (2008)	15 crises in construction	Remedies draw on internal as well as external sources of expertise, intensive communication and both formal and informal practices. Practices included mainly negotiations with client and subcontractors and re-planning and re-organising – including overtime and re-work
		Nikander and Eloranta (2001)	Interviews and case studies in construction projects	Complementing traditional project management planning with attention to early warning signals. 68 types of early warnings including gut feelings, conflicts, indecision.
	Pavlak (2004)	Conceptual with examples based on case studies	Troubleshooting through creative problem solving in “tiger teams” – high performance teams solving problems based on uninhibited constructive conflict	
General management	Individual and group level	Many studies in psychology, for example defensive mechanisms: shock, defensive, acknowledgement, adaptation (Fink et al., 1971), limited information processing capabilities, tendency for irrational and biased responses, shattered assumptions, victimisation (summarised by Pearson and Clair, 1998), threat rigidity theory - individuals, groups and organisations behave rigidly in threatening crisis situations (Chattopadhyay et al., 2001; George et al., 2006; Meszaros, 1999; Starbuck and Milliken, 1988; Staw et al., 1981)		
	Group level	Improvisation	Improvisation can be defined as “the conception of action as it unfolds, by an organization and/or its members, drawing on available material. Cognitive, affective and social resources” (Pina e Cunha et al., 1999). Often conceptualised around the Jazz metaphor, this concept had its peak in the 1990s and was considered a way to deal with unexpected events in	

		situations such as meetings.
Organisa- tional level	Prone to pre- pared	Preparation to crisis developing an organisation from <i>crisis prone</i> to <i>crisis prepared</i> through identifying types of crisis, regarding early warnings, construct systems that enable, for example, facing faulty rationalisations and engaging with stakeholders (Pearson and Mitroff, 1993).
	Resilience	An organisation that can adapt to and respond to crisis and develop from crisis to success (e.g. Hamel and Valikangas, 2003; Weick and Sutcliffe, 2001)

3 Research design

An adapted Repertory Grid (RepGrid) method was used to explore the unexpected event and their respective responses, which together form the unit of analysis of this study. RepGrid belongs to the family of cognitive mapping tools. Despite the name, the proposition that cognitive mapping is able to predict behavior is arguably flawed as it ignores the role of emotion (Eden, 1992). The process of articulating cognition in itself instigates reflection that can influence action. However it is reasonable to argue that

“[cognitive mapping] may represent subjective data more meaningfully than other models and so have utility for researchers interested in subjective knowledge.” (Eden, 1992, p. 262).

This fits well with the goal of the present study as it facilitates the process of unfolding the differences between a successful and unsuccessful response to unexpected events from the perspective of project or programme manager.

RepGrid is widely applied in IS research as summarised by Tan and Hunter (2002) and has gained some attention lately in project management research (Baloi and Price, 2003; Napier et al., 2009). This method was developed by Kelly (1955) in psychological studies in the 1950's. It is based on the identification of characteristics (or “constructs”) by comparing and contrasting different elements, in this study, responses to unexpected events. Goffin (2002) applies this technique to management research and suggests that the method is adequate to articulate perceptions about complex issues, so that explanations go beyond jargon, and new insights are likely to

emerge. Brown (1992) compared several cognitive mapping methods and RepGrid was positively evaluated for its truthfulness and value-tapping capacity, but criticized it mainly for its dependence on investigators' skills and ease to use. The criticisms were evident in our pilot study, in particular as regards the number of comparative elements. In order to facilitate the process and overcome both criticisms, we adapted the method by limiting comparative elements to two instead of at least three (details as below).

Data collection

Data collection followed three steps. The data collection instrument containing instructions on the use of the RepGrid was first piloted with six participants who tested it for clarity, adequacy and methodological rigor. Two were practitioners with over five years of experience in project management; two were academics with no experience in project management, but with experience in using the RepGrid method, and the remaining two participants had no experience in management or research. A significant feedback was that participants unfamiliar with the RepGrid method found it difficult and confusing to compare three or more types of events. They struggled to distinguish the events, what happened in each of them and assess their own response at the same time. We started the pilot considering five unexpected events and concluded with only two. As we were researching participants who are practising managers, we took the decision to avoid academic jargon. Instead, we used common language nomenclatures in the research instrument. For example, calling 'constructs', characteristics instead. Finally, it was decided that the instrument should be viewed and used by both participant and moderator. This improved discussions, promoted shared understanding and increased face validity of the study.

The instrument comprised a table with four columns along the lines of a repertory grid:

- Characteristics (constructs, in academic terms): the process was triggered by the question “what makes the response to the event A different to the response to event B?” The answer to this question was written down in the first column, the constructs. As each of these emerged, the moderator explored what they really meant, so that the constructs were described adequately, avoiding misunderstandings.
- Poles: here the participants described what they considered to be extreme success and failure for each of the constructs described in the first column. This not only enhanced understanding in what was meant by each of the constructs but also provided us with a scale for each construct.
- Rating for event A and B: based on the scale produced in the second column, responses to events A and B are then rated from 1 (extremely successful) to 5 (extremely unsuccessful).

22 experienced project managers from defence and defence-related organisations agreed to participate in the study. Eight are military officers involved in a number of transformation and equipment acquisition projects. Five are Ministry of Defence (MOD) civilian managers working on projects in the MOD’s Integrated Project Teams (IPTs). Nine are project managers from the private sector. We started by explaining the goals of the research and the interview process (how repertory grid works, including a demonstration of how the process unfolds). Then we asked the participant to choose responses to two comparable significant but not related *unexpected events* (event A and B) that happened in their projects. One response was to be perceived by them to be successful and the other to be unsuccessful. The events and their respective responses were

briefly described in written form. The second step comprised the repertory grid process per se. The responses to events A and B were compared and reported in written form through the instrument. The responses to events A and B were compared through a dialogue between the individual project or programme manager and a moderator. The moderator led the research exercise, and instigated the identification of different characteristics (constructs) and their underlining meaning. These were reported in written form on the instrument.

The process continued until the participants could not identify further constructs. The repertory grids had from one to six constructs. The majority (12 participants) identified two constructs. A total of 52 constructs were identified, and respondents took around 30 to 45 minutes to undertake the entire process.

Analysing the data

The data analysis followed three steps undertaken by the three researchers involved in the study. Firstly, we discussed each event and coded it according to the nature of what impacted the project/programme. We strived to avoid a typology of risk events, but rather to derive an overview of what happened in each event. The types emerged inductively. The process was interactive and the events were revisited by the researchers until there was a consensus on the types and their classifications.

We then followed the same process for the responses to these events. Here the focus was on what successful responses had that were lacking in unsuccessful responses, and what unsuccessful

ful responses had that were not present in successful responses. During this process, the constructs proposed in the repertory grid were grouped around six types of responses.

Finally, we evaluated the internal validity of the data by checking whether the successful responses were also considered more successful than the unsuccessful responses when using the six constructs identified in the research. The validity was confirmed.

4 Empirical Results

Seven different categories emerged from the 44 unexpected events analysed, namely *technical issues, sponsor withdrawing support, external events, resource change or constraint, human behaviour* and *project scope*.

Table 2 shows the number of responses to unexpected events that had successful and unsuccessful responses according to the type of event. The total number of events of each type varied from six to nine and consequently there was no type of event that was mentioned significantly more often than others. There were also a symmetric number of examples of successful and unsuccessful responses for each type of event. For example, we had three technical issues dealt with successfully and three unsuccessfully. Human behaviour was the only exception, and was more often associated with failure than success. This provided us with enough empirical data to discuss each of the types.

Table 2: Types of events

	Successful	Unsuccessful	Example	Total
Technical issues (TI)	3	3	Unexpected insufficient performance of a technical system	6
Sponsor withdrawing support (SS)	3	3	Project dismissed in senior management meeting	6
Externalities (external events out of influence of project) (EU)	4	4	War in an Latin American country	8
Resource change and constraints (RC)	5	4	Key resource pulled off to work on other projects	9
Human behaviour – disregarding rules and protocols (HB)	1	5	War protocol was neglected	6
Project scoping issues (PS)	6	3	Major changes in scope	9

Table 3 provides an overview of the six constructs that characterised the responses and which represented the differences between successful and unsuccessful responses. The table also indicates the number of times each of the constructs was mentioned by participants. Stakeholder engagement was mentioned by all the participants, followed by authority and capability of the team and flexibility of processes to respond to events. One could be tempted to link the types of events and these constructs but this would encourage misleading interpretations as the constructs were identified in the comparison between two disassociated events that were usually of a different type, and therefore the constructs cannot be attributed to a specific type of event.

Table 3: Characteristics and examples of successful responses

Constructs	Examples of successful responses	No. of times mentioned
A. Stakeholders' engagement	Negotiation of scope with client, reorganise stakeholders perception of risk	22
B. Capability of leader and team	Trained team, 'they know what they are doing'	19
C. Processes	Flexibility, no micro planning, contingency plan, control over decisions and resources	14
D. Behaviour	Avoidance of panic and overreaction	8
E. Communication	Availability and communication of information, acknowledge concerns of the team	8
F. Timing	High speed of approval process, good sense of urgency	8

5 Findings

Of interest is the difficulty of some of the participants to identify the truly 'unknown-unknowns'. They explained that it was difficult to recall events that had significant impact on their projects and were not identified and usually also part of the risk log. In other words, the events were "known-unknowns" rather than "unknown-unknowns". Known-unknowns are circumstances, outcomes or events that actors have identified as possibly existing, but do not know whether they will take place or not. Unknown-unknowns are those circumstances, events, outcomes that were not identified in the first place.

The ability to identify many possible risks reflects the experience of the participants as project and programme managers and the embeddedness of risk identification as an organisational routine. However, it also implies that identification may be relevant but it is not 'the' answer to uncertainty. Although some of the events analysed were predicted, not all of them had successful

responses, prompting the question “is success in responding to unexpected events a matter of luck?” In the next sections, we will discuss how project managers created their own luck and increased the success of their responses to unexpected events.

The three pillars

The six constructs identified in the RepGrid (Table 3) followed intuitively in the three domains of organisational responses distinguished in the literature: organisational, group and individual. They indicated that successful responses to unexpected events were organic and based on three pillars: a responsive and functioning structure at the organisational level, interpersonal relationship at the group level and competent people at the individual level. Figure 3 portrays these pillars and respective constructs. In the next sections, each pillar is discussed in detail.

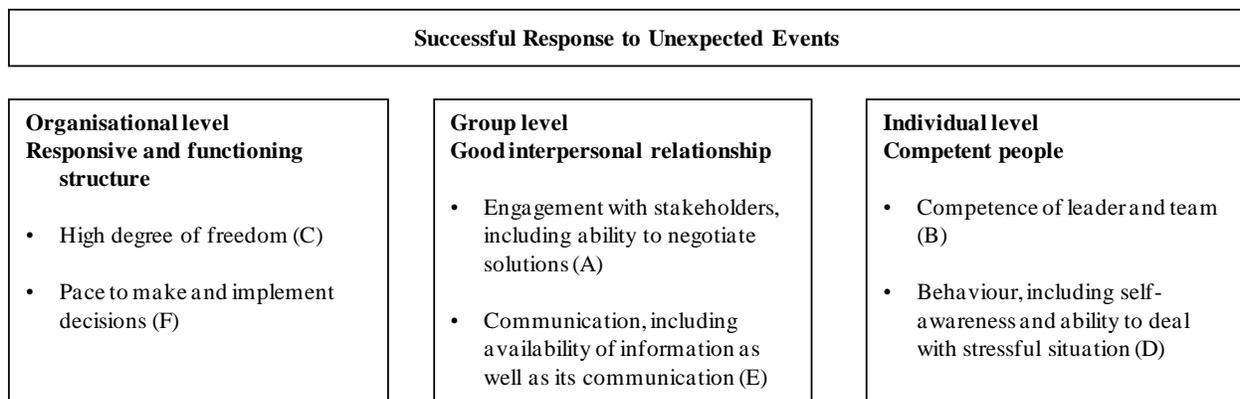


Figure 3: Three Pillars to Successful Response to Unexpected Events

Responsive and functioning structure

Not surprisingly, the results indicate that the ability of organisations to respond to changes appropriately and quickly was present in successful responses but lacking in unsuccessful responses to unexpected events. This ability was mentioned by the majority of participants in

terms of explicit management practices such as rapid decision making and implementation of these decisions. Successful responses characterised by top management involvement, provided projects managers the necessary political support to act quickly and accordingly. A sense of urgency and access availability to resources were perceived as success factors by, for example, a project team responsible for investigating and coping with an aircraft accident. The agility in scrambling a team to investigate the causes of the accident enabled quick and decisive processes, and the consequent solution of the issue with limited negative implications. The people available were not professionally trained, but the project manager was able to bridge the knowledge gap more efficiently in that situation than if a sufficiently trained team were in place, but delayed, as it was the case in the unsuccessful project used for comparison.

We termed this ability ‘responsive organisation’ after the definition proposed by Bernardes and Hanna (2009). The authors offer a distinction between flexibility, agility and responsiveness – often used interchangeably: flexibility is the ability to change within existing or pre-established parameters, agility relates to the ability to rapidly reconfigure within new parameters, and responsiveness refers to the purposeful and timely response to change. Based on this distinction, it is appropriate to term the organisation ability described as responsiveness.

Apart from being responsive, another relevant characteristic identified was empowerment. Participants as managers were allowed to decide what responses should be undertaken, how to do them, the choice of resources deemed necessary for their budget, and so on. This concept approximates that of situated action (Suchman, 1987), which is based on the premise that people involved in the specific situation are most able to judge what needs to be done, how to do it, etc.

Suchman advocates the shifting of responsibility and authority to the key people in each specific situation.

While successful responses were characterised by a high degree of freedom, unsuccessful responses exposed micro-management and excessive control by higher hierarchical levels within the project. Respondents explained that much time was spent justifying what should be done, and reporting what was done (up to a daily report), leaving little time to actually undertake the actions to put the project or programme back on track. For example, in a project to assist the transition to independence in an African country, resource requests were slow and some times had to be submitted several times. This severely hindered the ability to respond to the unexpected event successfully.

Some unsuccessful responses also suggested the relevance of functioning structures. Here, the project and programme managers mentioned that if the structure and processes are complicated and not working well before the event takes place, a good response is even more challenging. As reported by one of the participants, B [unsuccessful event] had descended into chaos due to conflicting PM approaches. Thus, successful responses rely on structures that are on one hand flexible but on the other, provide clear and simple principles and processes to manage projects.

Overall, the aspects of responsive and functioning structure remind project managers that a project should not be driven in maximum speed, considering, for example, overtime a standard practice, as unexpected event will most certainly happen, and the team needs buffer to cope with it

successfully. As with the Titanic, it is more difficult to see and respond to icebergs when driving at maximum speed.

Good interpersonal relationships

The second pillar is the relationships between people involved. All respondents mentioned engagement with stakeholders as key for successful responses. This was relevant in two instances.

Firstly, as expected, engagement with stakeholders played an important role in responding to unexpected event; all participants identified this construct. For example, in one of the unexpected events studied, the beneficiary raised the issue with the project team, and made sure that all sides involved were aligned and committed to enable enough resources to solve the problem. It was clear that the management of unexpected events needs to be recognised as a priority and escalated properly, and usually escalation *per se* is not necessarily an issue, but the type of support is. Some participants complained of a support system based on a top-down control, more intensive reporting and even daily short conversations with top management. This kind of response from top management does not provide support, but rather consumes time and resource that could have been used to cope with the impact of the unexpected event. Interestingly, over zealous top-down control was more apparent in private companies than in the military or MOD integrated project teams.

Secondly, negotiations with team members, clients and suppliers were another key characteristic of successful responses, lacking in unsuccessful responses. An example was the negotiation of a

ship survey contract with a different provider who was better able to increase the availability of ships necessary to cope with the unexpected event. Similar instances have also been identified in other studies (Söderholm, 2008).

Participants also stressed the importance of communication and the flow of information. The geographical distance in some military projects particularly in times of war, requires the availability of technology to communicate. Eight respondents stressed the relevance of availability and flow of information among team members, and one stressed the ability to listen and acknowledge the concerns of the team.

Competent people

The third pillar relates to competent people. Almost all respondents stressed the importance of people along lines similar to these listed below:

team and leader “knew what they were doing”

“having resource available with the right skills”

“providing the right resource in a timely manner”

“have cohesive teamwork”

Being able to trust the judgement of colleagues and their ability to resolve the situation also emerged as important. One participant described the benefits of clear leadership to provide a new direction after an unexpected event.

Another aspect mentioned by several participants was the ability of managers to control their emotions in stressful situations. Events where people ‘do not panic’ resulted in successful responses. On the other hand, over-reaction was associated with unsuccessful responses. This implies that project managers with high emotional intelligence (EQ) are more likely to respond to unexpected events successfully. This finding is in line with that of Müller and Turner (2007), who established a strong relationship between managers with high emotional intelligence (EQ) and project success.

6 Organisational embeddness in response to crises

The three pillars and their underlining concepts are closely related to other theories developed in general management. We have discussed them in relation to the theories and studies reviewed in the literature review on responses to crises and unexpected events in project contexts. The emergence of structure, people and relation as key constructs suggest that two additional topics (not previously identified in the literature) – post bureaucratic organisations and improvisation - might have relevance for this study.

The characteristics present in successful responses to unexpected events resonates some of the principles proposed by the post-bureaucratic organisations. Post-bureaucratic organisations emerged as an ideal type of organizing that functions as the opposite of bureaucracy, where the hierarchic, centralized and formalized bureaucratic organization is replaced by a flat, decentralized organization, emphasizing flexibility rather than rule-following (Heckscher, 1994), resem-

bling features of organic organizations (Burns and Stalker, 1961). Today, post-bureaucratic organizations are understood as a trend, rather than a singular type, that encompasses changes observed in the organizations, including the rhetoric of rapid change, globalization and competition in which survival depends on adaptation of organizations and flexibility, autonomy and commitment of employees – termed the fast capitalist story (Gee, 1996 in Alvesson and Thompson, 2006).

Flexibility, autonomy and commitment were identified as core constructs for successful responses. One potential area for future research would be to explore the relationship between post-bureaucratic organisations and the ability to respond to unexpected events. Taken the temporality of crises as suggested by (Engwall & Svensson, 2004), it could be suggested that organisations approximate to post-bureaucratic principles in face of crises. However, previous studies suggest that the instability created by crises lead organisations to the opposite direction, increasing direct control, reducing trust and intensifying organisational politics and lack of transparency (Loosemore, 1998b; Söderholm, 2008). Thus, such transformation is unlikely.

What previous research on crises management in project context suggests is that post-bureaucratic islands could be formed within organisations to respond to crises accordantly. Create an isolated team to cope with the crises is common, as the detaching strategies identified by Söderholm (2008), the ‘Cheetah organisations’ proposed by Engwall and Svensson (2001), or the tiger teams (Pavlak, 2004). These temporary organisations do not follow usual organisational *modus operandi*, have more access to resources, autonomy, higher levels of stress and work overtime.

However, the responses identified in our study were far more embedded in the current organisation, its mechanisms and available resources. As discussed in the data analysis, the responses demanded top management involvement in decisions, and draw on existing relationships with stakeholders, available competences, current structures and processes. If these were not functioning, the responses are unlikely to be successful. Thus, unlike previous studies, our participants did not stress the importance of the specific management action related to dealing with unexpected events, such as detaching strategy, but rather showed that the management of such events is widely embedded in the current structures and its ability to respond. As projects (Engwall, 2003), responses to crises within projects cannot be seen as islands. Future research could further explore to what extent is the response to unexpected events are embedded in current conditions of the project, its structure, leaders and team, and it puts forward a third proposition, that post-bureaucratic organisations are more able to respond to crises.

Ability to respond is not as an island, but embedded in current forms is what has been put forward in studies on improvisation and bricolage. Pina e Cunha et al (2001) defined organisational improvisation as *“the conception of action as it unfolds, by an organizational and/or its members, drawing on available material, cognitive, affective and social resources”* (Pina e Cunha et al., 1999). Similar to studies on crisis following the ‘Normal Accident Theory’ (Perrow, 1999), key in the discussions around improvisation is firstly the ability to act intelligently and accordingly in real time, when conception and actions converge to the same point in time (Moorman and Miner, 1998). Second aspect of improvisation is that it draws on available resources: *“if improvisation means responding in real time, then it immediately follows that improvisers cannot wait for optimal resources to be deployed and have to tackle the issues at hand with those that*

are currently available” (Pina e Cunha et al., 1999). The reconfiguration of resources to respond to current challenge is termed *bricolage*. This was clear in some of the responses studied, where rapid deployment of resources overrides the optimal set of competences for the task.

7 The importance of the pillars

Contrary to what we expected, the data did not indicate that some types of change were usually dealt with more successfully than others. Each type of event had a similar number of successful and unsuccessfully responses (see Table 2).

It could be argued that this symmetry is a consequence of the methodology applied in the study. As each participant was asked to provide an example of a successful and an unsuccessful response to unexpected events, it is likely that they may have thought about similar types of events. However, a careful analysis of the data showed that this does not hold true, and the type of ‘event A’ from each participant (dealt with successfully) was usually different than the type of ‘event B’ (dealt with unsuccessfully). This strengthens the argument that, at least for the 44 responses to unexpected events analysed, the three pillars are these that differentiate between success and failure, regardless of the type of event that might impact the project or programme.

While all other types of event could be either managed successfully or not, human behaviour issues predominantly led to failure (see Table 2). Examples of such change were negligence of procedures, bypassing milestones or agreement of other parties.

Human behaviour issues straddle across the three pillars. They can hamper a ‘responsive and functioning structure’ (pillar 1) as structures rely on people’s competence and appropriate behaviour. Inappropriate or opportunistic behaviour can also damage the second pillar (good interpersonal relationships). Finally, behavioural issues can have a negative impact on pillar 3, as the competence of employees would be put into question. Thus, people lay at the heart of the response to unexpected events.

Thus, the responses to unexpected events analysed suggest that improvement in project management can be achieved by better managing these three pillars. This enables project and programme managers to “*create their own luck*”, and encourages a lean approach to project and programme management. The study findings indicate the need to refrain from merely adopting a process-based approach to predict all possible events and prescribe appropriate responses *ab initio*. It was the combination of structure, people and relationships that was more likely to enable a successful response to an unexpected event.

8 Conclusions

No matter how good risk management processes are, projects will invariably face unexpected events. The aim of this study was to identify what differentiated successful and unsuccessful responses to unexpected events from the perspective of project and programme managers. We interviewed 22 experienced project managers using Repertory Grid as a data collection method.

The results indicated that structural solutions based on the creation of an isolated team to deal with unexpected event such as the cheetah team (Engwall and Svensson, 2001), or detaching

strategies (Söderholm, 2008) are important, but not necessarily possible. The examples of successful responses were much embedded and dependent on the current organisational structures available to projects. However, the heart of successful responses to unexpected responses lies with *people assets*, especially in terms of stakeholder engagement, negotiation and leadership skills.

The research suggests that successful responses to unexpected events were built on three pillars: responsive and functioning structures, good interpersonal relationship and competent people. As the Titanic sailed close to the unexpected iceberg, careful attention by organisations in allowing empowerment supported by these three pillars could have helped avoid or reduce adverse consequences – that is, people can “*create their own luck*”.

This has two important implications for current approaches to managing projects and teaching project management. It suggests that linear project management approaches could usefully be complemented with ways to deal with unexpected events. Just as it is time to accept the importance of people in projects, it is also vital that project personnel acknowledge that “the unexpected happens” and that front-end thinking alone is not going to be enough to develop successful projects. The study participants highlighted simple, responsive and functioning structures as a fundamental pillar of success. Further research could explore this in greater depth and identify these structures in more detail by asking, “what (constructed) organisational responses would best support project and programme managers to react to unexpected events successfully?” and “how do we construct resilient organisations that are able to avoid rigidity and ‘chaos’?”

Secondly, the results call for further studies focusing on the behavioural aspects of project management, including how to prepare people to cope with the stress involved in unexpected events. Also further studies following the ideas of practice would shed light into what project and programme managers really do to respond to such events.

This research was of exploratory nature. Further research could explore each of these pillars in more detail. Case studies could observe the actual reactions to unexpected events and how project and programme managers used these pillars in fact to enable successful responses. Loosemore (1998b) argued that usually exactly those factors that would have been relevant in the moment of crisis are usually lacking. This begs the question of whether and how organisations could develop these pillars beforehand and still be sure they would not lose strength in the moment of need, i.e. how companies learn to be prepared for unexpected events.

9 A reflection on study limitations

Hindsight offers a 20:20 vision of how we could do things better. On reflection, this has been a journey of discovery for the researchers as well as the participants (who as busy managers, never really stopped to reflect on the possible reasons for their actions and behaviours). The motivation for the present study is the limited understanding on individual perceptions and responses to unexpected events in the project environment. Its function is exploratory as there is little in the project literature to provide strong theoretical underpinning. We drew on the literatures from sociology, psychology and management disciplines, in particular, from research on behaviours in crisis. Inductive data analysis and interpretation revealed other possible explanations, especially

the concepts of post-bureaucratic organisations and improvisation. Hence, although the present study has given us an early appreciation of situated responses to unexpected events in projects and their evaluations as a success or failure, the findings can only be generally informative rather than to provide specific solutions for various ad hoc events.

In our effort to delve deep into the human cognition of their actions and consequences, we opted for the Repertory Grid instead of straight-forward interviews. The primary strength of the Rep-Grid method is comparability. As relative novices and in view of the expressed difficulty by participants of juggling events, responses and assessments, we had to adapt the Grid for easier participant and moderator use. We started with five constructs but had to be content with two. We accept that reducing from five to two constructs and relating the findings mostly to the crisis management studies, we could have constrained breadth of analysis and insights. A small point in our favour is our discussion on the embeddedness of organisational practices in crisis using organisational theory and organisation behaviour literature.

As we were working with practitioners who are unfamiliar with both the instrument and academic research, we attempted to avoid using any ‘jargon’. Arguably, this could lead to meaning being lost in translation, requiring explanation or clarification by the researcher (e.g. using the phrase ‘significant unforeseeable events’ to draw out ‘unknowns-unknowns’ as well as covering ‘known-unknowns’). Although some researchers might argue for the need to control individual bias and rationalising by participants, the import of the present study’s objective of assessing successful and non-successful responses *as seen from the eyes of the participants* lies in the fact that perceptions underlines attitudes, emotions, and motivations. To begin understanding how

well people *see* they have responded to any unexpected event, means having to accept that bias and post-event rationalisation are part of the ‘package’. The strength of this research is that we refrained from judging participants’ motives; instead we aimed to allow patterns to emerge. This does not mean, however, that researchers’ bias can be eradicated entirely.

Our sample consisted of experienced project and programme managers who are in the defence or defence-related industry is sound but the split between groups could be more even. Were we to run this project again, we would direct participants to think of ‘real’ projects that are fully aligned with the standard definitions by PMI or APM of “what is a project”. This does not mean that the undertakings by the military participants (or indeed the analogy with the Titanic) are ‘non-projects’. Each was uncertain, unique to some extent, mission driven, temporary (had to be performed in a timely fashion or by a set date) and involved clear outcome deliveries. The main departure for the military is that money or budget is the least of the three primary constraints as achieving the mission is the key imperative. Planning and scheduling are important activities for military project managers as in the project to help an African nation transit to democratic governance. Likewise, the design and build of the Titanic was a major project even by present-day terms.

10 References

Alvesson, M., Thompson, P., 2006. Post-bureaucracy, in: Ackroyd, S., Batt, R., Thompson, P., Tolbert, P.S. (Eds.), *The Oxford Handbook of Work and Organization*, Oxford University Press, Oxford, pp. 485–507.

- APM, 2006. *APM Body of Knowledge*. 5th ed. Association for Project Management, Buckinghamshire.
- Arrow, K.J., 1983. Behaviour under uncertainty and its implications for policy, in: Stigum, B.P., Wenstop, F. (Eds.), *Foundations of Utility and Risk Theory with Applications*, D. Reidel Publishing Company, Dordrecht, pp. 19 - 32.
- Baloi, D., Price, A.D.F., 2003. Modelling global risk factors affecting construction cost performance. *International Journal of Project Management* 21 (4), 261-269.
- Bernardes, E., Hanna, M., 2009. A theoretical review of flexibility, agility and responsiveness in the operations management literature. *International Journal of Operations and Production Management* 29 (1), 30-53.
- Borge, D., 2001. *The Book of Risk*. John Wiley & Sons, New York.
- Brown, S.M., 1992. Cognitive mapping and repertory grids for qualitative survey research: some comparative observations. *Journal of Management Studies* 29 (3), 287-307.
- Burns, T., Stalker, G.M., 1961. *The Management of Innovation*. Tavistock, London.
- Carmeli, A., Halevi, M., 2009. How top management team behavioral integration and behavioral complexity enable organizational ambidexterity: The moderating role of contextual ambidexterity. *The Leadership Quarterly* 2 (1), 207-218.
- Chapman, C., Ward, S., 2002. *Managing Project Risk and Uncertainty*. John Wiley & Sons, West Sussex.
- Chattopadhyay, P., Glick, W.H., Huber, G.P., 2001. Organizational Actions in Response to Threats and Opportunities. *Academy of Management Journal* 44 (5), 937-955.
- De Meyer, A., Loch, C.H., Pich, M.T., 2002. Managing project uncertainty: from variation to chaos. *Engineering Management Review, IEEE* 30 (3), 91-91.

- Eden, C., 1992. On the nature of cognitive maps. *Journal of Management Studies* 29 (3), 261-265.
- Engwall, M., 2003. No project is an island: linking projects to history and context. *Research Policy* 32 (5), 789-808.
- Engwall, M., Svensson, C., 2001. Cheetah teams. *Harvard Business Review* 79 (2), 20.
- Engwall, M., Svensson, C., 2004. Cheetah teams in product development: the most extreme form of temporary organization? *Scandinavian Journal of Management* 20 (3), 297-317.
- Fink, S.L., Beak, J., Taddeo, K., 1971. Organizational crisis and change. *The Journal of Applied Behavioral Science* 7 (1), 15-37.
- Frosdick, S., 1997. The techniques of risk analysis are insufficient in themselves. *Disaster Prevention and Management* 6 (3), 165 - 177.
- George, E., Chattopadhyay, P., Sitkin, S.B., Barden, J., 2006. Cognitive Underpinnings of Institutional Persistence and Change: a Framing Perspective. *Academy of Management Review* 31 (2), 347-365.
- Goffin, K., 2002. Repertory grid technique, in: Partington, D. (Ed.), *Essential Skills for Management Research*, Sage, London, pp. 199-225.
- Hällgren, M., Wilson, T.L., 2008. The nature and management of crises in construction projects: Projects-as-practice observations. *International Journal of Project Management* 26 (8), 830-838.
- Hamel, G., Valikangas, L., 2003. The quest for resilience. *Harvard Business Review* 81 (9), 52-65.

- Heckscher, C., 1994. Defining the post-bureaucratic type, in: Heckscher, C. (Ed.), *The Post-Bureaucratic Organization: New Perspectives on Organizational Change*, Sage, Newbury Park.
- Huchzermeier, A., Loch, C.H., 2001. Project Management Under Risk: Using the Real Options Approach to Evaluate Flexibility in R&D. *Management Science* 47 (1), 85-101.
- Jarzabkowski, P., Spee, A.P., 2009. Strategy as practice: A review and future directions for the field. *International Journal of Management Reviews* 11 (1), 69-95.
- Kahneman, D., Tversky, A., 1979. Prospect theory: An analysis of decision under risk. *Econometrica* 47 (2), 263 - 291.
- Kelly, G.A., 1955. *The Psychology of Personal Constructs*. W.W. Norton, New York.
- Loch, C., DeMeyer, A., Pich, M., 2006. *Managing the unknown: a new approach to managing high uncertainty and risk in projects*. John Wiley & Sons, Inc. New York, NY, USA.
- Loosemore, M., 1998a. Organisational behaviour during a construction crisis. *International Journal of Project Management* 16 (2), 115-121.
- Loosemore, M., 1998b. The three ironies of crisis management in construction projects. *International Journal of Project Management* 16 (3), 139-144.
- Loosemore, M., 2000. *Crisis management in construction projects*. American Society of Civil Engineers, Danvers.
- Maylor, H., 2005. *Project Management*. 3rd ed. Financial Times/ Prentice Hall, Essex.
- Meszaros, J.R., 1999. Preventative choices: Organizations' heuristics, decision processes and catastrophic risks. *Journal of Management Studies* 36 (7), 977-998.
- Moorman, C., Miner, A., 1998. The convergence of planning and execution: improvisation in new product development. *The Journal of Marketing*, 1-20.

- Müller, R., Turner, J.R., 2007. Matching the project manager's leadership style to project type. *International Journal of Project Management* 25 (1), 21-32.
- Napier, N.P., Keil, M., Tan, F.B., 2009. IT project managers' construction of successful project management practice: a repertory grid investigation. *Information Systems Journal* 19, 255-282.
- Nikander, I.O., Eloranta, E., 2001. Project management by early warnings. *International Journal of Project Management* 19 (7), 385-399.
- Pavlak, A., 2004. Project troubleshooting: Tiger teams for reactive risk management. *Project Management Journal* 35 (4), 5-14.
- Pearson, C.M., Clair, J.A., 1998. Reframing crisis management. *Academy of Management Review*, 59-76.
- Pearson, C.M., Mitroff, II, 1993. From crisis prone to crisis prepared: a framework for crisis management. *Academy of Management Executive* 7 (1), 48-59.
- Pender, S., 2001. Managing incomplete knowledge: Why risk management is not sufficient. *International Journal of Project Management* 19, 79 - 87.
- Perrow, C., 1994. The limits of safety: the enhancement of a theory of accidents. *Journal of Contingencies and Crisis Management* 2 (4), 212-220.
- Perrow, C., 1999. *Normal Accidents: Living with High-Risk Technologies*. Princeton University Press, Princeton.
- Pich, M.T., Loch, C.H., De Meyer, A., 2002. On uncertainty, ambiguity, and complexity in project management. *Management Science*, 1008-1023.
- Pina e Cunha, M., Vieira da Cunha, J., Kamoche, K., 1999. Organizational improvisation: what, when, how and why. *International Journal of Management Reviews* 1 (3), 299.

- PMBok, P., 2004. *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*, Project Management Institute Newtown Square, PA.
- Schatzki, T.R., 1996. *Social Practices: a Wittgensteinian approach to human activity and the social*. Cambridge University Press.
- Söderholm, A., 2008. Project management of unexpected events. *International Journal of Project Management* 26 (1), 80-86.
- Starbuck, W.H., Milliken, F.J., 1988. Challenger: Fine-tuning the odds until something breaks. *Journal of Management Studies* 25 (4), 319-340.
- Staw, B.M., Sandelands, L.E., Dutton, J.E., 1981. Threat-rigidity effects in organizational behavior: A multilevel analysis. *Administrative Science Quarterly* 26 (4), 501-524.
- Suchman, L.A., 1987. *Plans and Situated Actions: The Problem of Human-Machine Communication*. Cambridge University Press, Cambridge.
- Sun, M., Meng, X., 2008. Taxonomy for change causes and effects in construction projects. *International Journal of Project Management* 27 (6), 560-572.
- Tan, F.B., Hunter, M.G., 2002. The repertory grid technique: A method for the study of cognition in information systems. *Management Information Systems Quarterly* 26 (1), 39-57.
- Ward, S., Chapman, C., 2002a. *Project Uncertainty Management as a Desirable Future*, University of Southampton, Southampton.
- Ward, S., Chapman, C., 2002b. Transforming project risk management into project uncertainty management. *International Journal of Project Management* 21 (2), 97-105.
- Weick, K.E., 1995. *Making Sense of the Organisation*. Sage.
- Weick, K.E., Sutcliffe, K.M., 2001. *Managing the Unexpected: Assuring High Performance in an Age of Complexity*. Jossey-Bass San Francisco.

Williams, T.J., 2005. Assessing and moving from the dominant project management discourse in the light of project overruns. *IEEE Transactions on Engineering Management* 52 (4), 497-508.

The Titanic sunk, so what?

Project manager response to unexpected events

Joana G. Geraldi

Liz Lee-Kelley

Elmar Kutsch

Abstract

Projects are inherently uncertain and face unexpected events, from small changes in scope to unforeseen client's bankruptcy. This paper studies how project managers respond to such events and how successful and unsuccessful responses differ from the perspective of the practitioner. We analysed 44 unexpected events faced by 22 experienced project managers in defence and defence-related organisations. The project managers compared two unexpected events that they faced, one that they considered the response successful and the other, unsuccessful. We identified three pillars supporting successful responses to unexpected events: (1) responsive and functioning structure at the organizational level, (2) good interpersonal relationship at the group level and (3) competent people at the individual level. The events and respective responses analysed suggest that improvement in project management can be achieved by better managing these three pillars, allowing project and programme managers to "*create their own luck*".

The Titanic sunk, so what?

Project manager response to unexpected events

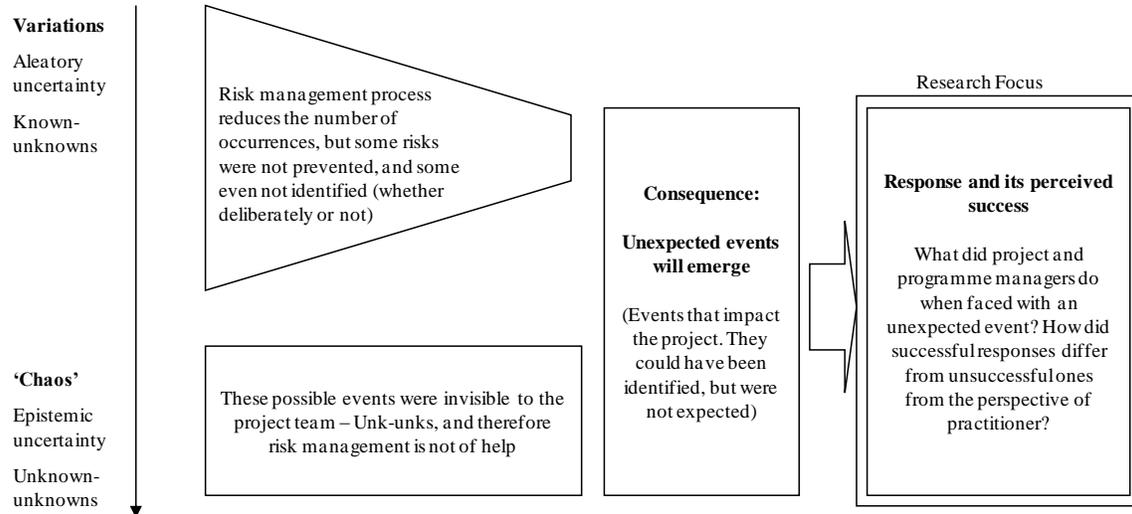


Figure 1: Focus of the Research

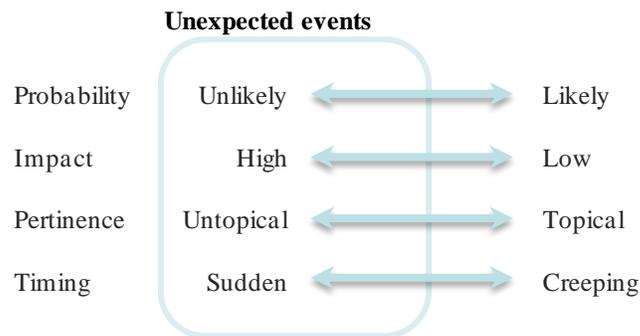


Figure 2: Differentiating aspects of unexpected events



Figure 3: Three Pillars to Successful Response to Unexpected Events

The Titanic sunk, so what?

Project manager response to unexpected events

Table 1: Literature on practices related to unexpected events

	<i>Focus</i>	<i>Source</i>	<i>Methodology</i>	<i>Responses</i>
Project context	Individual and group level	Loosemore (1998a)	Case studies in construction projects	Preconceived beliefs and attitudes, level of uncertainty surrounding financial responsibility and pressure
		Loosemore (1998b)	Case studies in construction projects	Necessity but usual lack of team work and collective responsibility, effective communication and mutual sensitivity between project members
	Group and organisational level	Söderholm (2008)	Four case studies of different project types in different industries	Most used practices were: Detaching strategies, setting up intensive meeting schedules and negotiating project conditions
		Engwall and Svensson (2001; 2004)	Three case studies in product development projects	Cheetah organisations: Abrupt emergence of ad hoc organisations composed to solve unexpected problems. They are explicitly sanctioned, have full-time members, are action-oriented – accomplish a specific mission, and are smaller and more time limited than usual temporary organisations (the duration varies from 3 to 8 weeks).
		Hällgren and Wilson (2008)	15 crises in construction	Remedies draw on internal as well as external sources of expertise, intensive communication and both formal and informal practices. Practices included mainly negotiations with client and subcontractors and re-planning and re-organising – including overtime and re-work
		Nikander and Eloranta (2001)	Interviews and case studies in construction projects	Complementing traditional project management planning with attention to early warning signals. 68 types of early warnings including gut feelings, conflicts, indecision.
Pavlak (2004)	Conceptual with examples based on case studies	Troubleshooting through creative problem solving in “tiger teams” – high performance teams solving problems based on uninhibited constructive conflict		
General manage-	Individual and group level	Many studies in psychology, for example defensive mechanisms: shock, defensive, acknowledgement, adaptation (Fink et al., 1971), limited information processing capabilities, tendency for irrational and biased responses, shattered assumptions, victimisation (summarised by Pearson and Clair, 1998), threat rigidity theory - individuals, groups and organisations behave rigidly in threatening crisis situations (Chattopadhyay et al., 2001; George et al., 2006; Meszaros, 1999; Starbuck and Milliken, 1988; Staw et al., 1981)		
	Group level	Improvisation	Improvisation can be defined as “the conception of action as it unfolds, by an organization and/or its members, drawing on available material. Cognitive, affective and social resources” (Pina e Cunha et al., 1999). Often conceptualised	

		around the Jazz metaphor, this concept had its peak in the 1990s and was considered a way to deal with unexpected events in situations such as meetings.
Organisa- tional level	Prone to pre- pared	Preparation to crisis developing an organisation from <i>crisis prone</i> to <i>crisis prepared</i> through identifying types of crisis, regarding early warnings, construct systems that enable, for example, facing faulty rationalisations and engaging with stakeholders (Pearson and Mitroff, 1993).
	Resilience	An organisation that can adapt to and respond to crisis and develop from crisis to success (e.g. Hamel and Valikangas, 2003; Weick and Sutcliffe, 2001)

Table 2: Types of events

	Success- ful	Unsuc- cessful	Example	Total
Technical issues (TI)	3	3	Unexpected insufficient performance of a technical system	6
Sponsor withdrawing support (SS)	3	3	Project dismissed in senior management meeting	6
Externalities (external events out of influence of project) (EU)	4	4	War in an Latin American country	8
Resource change and constraints (RC)	5	4	Key resource pulled off to work on other projects	9
Human behaviour – disregarding rules and protocols (HB)	1	5	War protocol was neglected	6
Project scoping issues (PS)	6	3	Major changes in scope	9

Table 3: Characteristics and examples of successful responses

Constructs	Examples of successful responses	No. of times mentioned
A. Stakeholders' engagement	Negotiation of scope with client, reorganise stakeholders perception of risk	22
B. Capability of leader and team	Trained team, 'they know what they are doing'	19
C. Processes	Flexibility, no micro planning, contingency plan, control over decisions and resources	14
D. Behaviour	Avoidance of panic and overreaction	8
E. Communication	Availability and communication of information, acknowledge concerns of the team	8
F. Timing	High speed of approval process, good sense of urgency	8