RESILIENT PROJECT MANAGEMENT

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Abstract. For some time, the term resilience has been used in project management research to address the ability to organize under a variety of scenarios of uncertainty and sudden change, including disruptions in the form of shocks or stressors. This paper examines the prerequisites in projects, organizations, and teams as well as individuals for resilient management of projects based on two complementary empirical sources First, the results of eight case vignettes based on semi-structured online interviews with project management practitioners are presented. Subsequently, results were reviewed and enriched with the experiences of experienced project managers in a group discussion. Findings highlight the importance of preparation and awareness, diversity and equality in the team and information relationships. On the other hand, resilient organizations are characterized more formalization, centralized and individualistic decision-making. Above all project managers acting prudently and flexibly along the time axis from incubation to coping and recovery.

Keywords: resilience; uncertainty; decision-making; organization structure; project orientation, risk culture team orientation; mindfulness

1. INTRODUCTION

Projects are strongly influenced by environmental, technological or market dynamics, exposed to the constant risk of failure. Project complexity, where the small details of projects are inherently unpredictable and can have serious consequences, ambiguity of various stakeholder's demands, and volatility of environmental requirements demands an adaptive approach to project management beyond the iron triangle to complete the project on time, within budget and within performance goals. Most scholars (but maybe not practitioners) nowadays argue for flexible structures, sense-making and an open, involving culture when confronted with turbulences (Saunders, 2015; Söderholm, 2008). Following concepts of organizational resilience, they argue that trust a high degree of freedom at the shop floor and team level allowing for quicker decisions and self-determined choice to successfully respond to unexpected events (Johansen, Halvorsen, Haddadic, & Langlo, 2014; Saunders, Gale, & Sherry, 2016). Soft factors, such as behavior, leadership, skills, communication, and organizational and project culture, become more important (Borgert, 2013; Kutsch, Hall, & Turner, 2016).

Looking more closely on the recommendations, advice is not as unanimously as expected, given the long-standing research and the high number of case reports in literature. It is, for example still a matter of arguments whether decision should be made including all people concerned in decision-making or if a decisive leadership is better. Are suggestions for projects independent from the organizational structure and culture of the parent organization? And we will get contradicting answers whether slow or fast response is appropriate, to name a few concerns. Managing projects characterized by complexity in volatile environments has become a topic of diverging approaches (Nachbagauer, 2021; Stingl & Geraldi, 2017).

For some time, project management scholars have moved towards resilient projects (Naderpajouh, Matinheikki, Keeys, Aldrich, & Linkov, 2020). The stream of research includes both resilience projects in response to adversaries (Hällgren, Rouleau, & Rond, 2018), and project resilience with the focus on resilience of projects themselves (Kutsch et al., 2016). This paper addresses the resilience of projects themselves, which are externally embedded in an organization and shaped by the internal environment of the individual project manager and the project team. We want to know, which conditions and which actions at the level of the organization, the project, the team, and the project manager enable resilient project management?

After a short overview on concepts and research on resilience in organizations and projects, results from two complementary research sources are used to refine propositions derived from literature. First, findings from eight case vignettes based on semi-structured online interviews with project management practitioners are presented. Subsequently, experienced project managers reviewed the outcomes of the case studies and literature research in a group discussion and enriched them with their experiences. Results emphasizes the importance of preparation and planning, integrative and unprejudiced decision making, a positive and open project team culture, acting cautiously under risk and not giving in to urgency and individual resilience of project managers.

2. CONCEPT OF RESILIENCE

Resilience in organization studies

In organization studies capabilities to deal with abrupt changes in the environment have been investigated from various theoretical viewpoints, in particular, research on resilience and high-reliability organizations. Many ideas and conceptions are grounded in Karl E. Weick's seminal work on sense-making and mindfulness (Weick, 1988; Weick & Sutcliffe, 2007; Weick, Sutcliffe, & Obstfeld, 1999). Weick's (1990, 1993) studies on the Mann Gulch firefighters' disaster and the Tenerife airplanes accident show, how structures are bound to fail when people don't understand what is going on in their environment and even more so, when they cannot make sense of the other one's actions. Especially in urgent situations, prior shared sense-making is important, whereas with more time available collective sense-making could become negotiated, and necessarily linked to the constant exchange with others.

Hamel and Välikangas (2003, 1) argued in their "Quest for Resilience" that organizations have to permanently be aware of "revolutionary changes" that come in "lightning quick". Välikangas (2010) further defines resilience as the ability of a system to resist major changes and thus endure perturbation without systemic change, while Ortiz-de-Mandojana and Bansal (2016) stress the organization's ability to sense and correct maladaptive tendencies and cope positively with unexpected situations. Research on resilience focuses on reactions to unexpected, potentially (life) threatening events on at least three levels: individual, team, and organization (Farjoun & Starbuck, 2007; Kayes, 2015; Naderpajouh et al., 2020).

Individual resilience is the psychological capacity that allows individuals to withstand stress, to cope with adverse situations, and even grow in the face of crisis (Masten, 2007; Ong, Bergeman, & Boker, 2009). Factors normally connected to individual resilience can be grouped into four

categories: personality traits (or characteristics), problem solving skills, social competences, and emotions (Cooper, Flint-Taylor, & Pearn, 2013; Rees, Breen, Cusack, & Hegney, 2015). While older research treated resilience as personal trait, recent literature highlights that individual resilience is highly dependent on the context. Thus, resilience-enhancing factors successful in one context might not be relevant in another context. Furthermore, studies point to the importance of social support for individual resilience (Fletcher & Sarkar, 2013; Wilson & Ferch, 2005). Based on individual competences, team resilience enables the team to jointly sense and correct maladaptive tendencies. Abilities to cope positively with unexpected situations can arise from a team's positive orientation towards acquiring new skills, mastering new situations, and improving competences, and from collective efficacy, i.e., the group's shared belief in its conjoint capabilities to organize and execute the courses of action (Ortiz-de-Mandojana & Bansal 2016, Bandura 1998).

Organizational resilience is the ability of the organization to rebound from adverse and unexpected situations towards the right path to success. Building blocks of resilience are prior sense-making, resourcefulness, adaption, and robustness (Orton & Weick, 1990). Resilient organizations are characterized by "conceptual slack, ad hoc problem-solving networks and [...] rich media to communicate" (Sutcliffe & Vogus, 2003, p. 101). They reduce the degree of control; they lessen immediate activity and increase their requisite variety. Tasks are not understood as instructions or fixed responsibilities but are formed by coordinating activities (enacted). Against the backdrop of the shared goal, team members are encouraged to track possible misassumptions and to question known routines (Kayes, 2015). Resilience on organizational level also stems from processes that encourage mindfulness (Sutcliffe, Vogus, & Dane, 2016). The project team needs to understand the situation and to have the feeling of manageability. This asks for options of influence and actions for every individual, for transparency of goals, impact factors, events and situations (Borgert, 2013).

High-reliability organizing has originally focused on safety-critical environments only and on absolute reliability: Well-known application fields are nuclear power plants, aircraft carriers and air traffic control systems (Bigley & Roberts, 2001; La Porte, 1996; Ramanujam & Roberts, 2018). More recently, the concept of high-reliability organizations (HRO) has been merged with the idea of resilient management. HRO, as described by Weick and Sutcliffe (2007), emphasize the necessary mindfulness and organizational preparation for the unexpected incident, as well as learning effects from such events (Christianson, Farkas, Sutcliffe, & Weick, 2009).

Weick, Sutcliffe & Obstfeld (1999) recommend five principles for managing the unexpected: (1) preoccupation of failure, (2) reluctance to simplify, (3) sensitivity to operations, (4) commitment to resilience, and (5) deference to expertise. HROs strive for flexibility, because unlike anticipation, which encourages thinking first and acting then, flexibility encourages action while thinking so that we can think more clearly. This elasticity also comprises decision structures which put knowledge and skills above hierarchy, and which delegate decision-making responsibility to the shop-floor level. In retrospect, project managers should take their teams through decision-making involved by using systematic review procedures and reflect on how to handle the event more mindfully (Weick & Sutcliffe, 2007).

Resilience in project management

Project resilience was first addressed by Kutsch et al. (2016) as capacity to organize under a variety of scenarios, including disruptions in the form of shocks or stressors. Resilience research goes beyond the traditional project risk management and the assumption that one can manage risks. Risks are potentially unknown in advance and therefore unmanageable, and projects inherently vulnerable to external shocks (Bredillet & Tywoniak, 2016). Recently. Nachbagauer and Schirl-Böck (2019) argued that past project management research has neglected risk and uncertainty while taking a hierarchical planning and control focused approach, while we need a resilient approach based on self-organizing.

Certainly, disruption and vulnerability under conditions of urgency is not new to project management scholars and practitioners. In project management theory, we find traditional approaches recommending getting a grip on turbulences by anticipating changes as early as possible, while solutions that are more recent call to rethink arrangements of structure and flexibility (Söderholm, 2008). Scholars argue for more flexibility and reduced control in decision-making situations, for responsibilities to be delegated locally, for situation awareness, collective sense-making, and mindfulness (Atkinson, Crawford, & Ward, 2006; Merkus et al., 2017). Novel approaches, such as agile project work, ad hoc teams and adaptive structures are gaining ground (Geraldi, Lee-Kelley, & Kutsch, 2010; Wysocki & Brown, 2019).

According to Johansen et al. (2014), project team members should be entitled and even stimulated to express their concern in regular uncertainty analysis workshops. It is important that project owners become actively involved in managing uncertainty in projects with a hands-on- rather than a hands-in- attitude. Learning and knowledge creation are seen as essential parts of uncertainty management, which need to be followed systematically in a supportive, dynamic reflective process. Atkinson et al. (2006) suggested that uncertainty management asks for trust building, sense-making, organizational learning, and an appropriate organizational culture.

According to Kutsch et al. (2016) the road to project resilience entails five key stages, from the scanning of signals of change in the environment (noticing), to the understanding of those signals (interpreting), planning of responses (preparing), and reduction of damage when the change occurs (containing) and, finally, the adaptation to the new reality resulting from the unexpected crisis (recovering). The resilience of a project is based on acceptance of risks and uncertainty, and readiness for continuous learning.

Saunders et al. (2016) analyzed project management responses to project uncertainty taken from high-reliability practices. In their empirical study on civil nuclear and aerospace projects, they found that project manager adopted high-reliability practices for managing uncertainty in projects, inter alia, an open and no-blame learning culture, decentralized decision-making processes, and mindfulness. When drafting high-reliability project organizing, Saunders (2015) recommends clear high-level decision-making rules and a strong organizational culture built on openness, communities of practice, team learning, and trust. The team is encouraged to discuss and negotiate its way and reluctant to simplify interpretations of project situations. Redundancy and conceptual slack in terms of processing multiple interpretations of events is encouraged.

Levels and timeline of resilience

Ramanujam (2018) differentiates between the system, interorganizational, organizational, organizational subunit, team and individual level of resilience and reliability standards. Naderpajouh et al. (2020), redefines these levels for project management to society, industry, organization, project, team or group, and individual, respectively, pointing especially to mutual influences and preconditions. This paper focusses on the project, at the parent-system, i.e., the organization, and the internal environment, i.e., project manager and project team.

In addition to consideration of levels literature on resilience emphasizes the temporal dimension, i.e., the variations of performance over time, arguing that in these phases different patterns of actions, capabilities and mind-sets are necessary, both of the organization and the individuals involved (Darkow, 2019; Kayes, 2015; Nachbagauer & Schirl-Böck, 2020). Usually, three phase are distinguished Three phases are distinguished under similar names (Duchek, 2020; Ramanujam, 2018), i.e., anticipation, coping and adaption; absorption, adaption, restoration; or anticipation, response and resilience Accumulated crises are sometimes divided into four phases with a separate disruption and recovery phase (Vakilzadeh & Haase, 2021). Centering on unexpected adversaries, this paper follows a three-step model.

Based on the literature, the research embarks on the propositions summarized in Table 1.

TABLE 1. RESEARCH PROPOSITIONS (OWN SOURCE)

Level	Proposition
Organization	P1: The better organizational culture and structure, resources and external conditions harmonize with each other, the more successful organizations are in coping with the unexpected adverse situation.
	P2: The more adaptable the decision-making and communication structures are, the more successful the organization is in dealing with unexpected adverse circumstances.
Team	P3: The better project teams can act beyond routines, the more successful they will be in dealing with the unexpected adverse situation.
	P4: The greater the tolerance for mistakes and the more active the examination of mistakes, the more successful the project team is in coping with the unexpected adverse situation.
Individual	P5: The more project managers dissociate themselves from the idea of completely predictable situations, the more successful they become in dealing with unexpected adverse situations.
	P6: The better project managers can act beyond routines, the more successful they will be in dealing with the unexpected adverse situation.
Timeline	P7: Depending on the phase before, during or after coping with the unexpected adverse situation, organizations, teams, and individuals need different structures and patterns of action.

3. METHODOLOGY

Aiming to gain an exploratory understanding of resilience in projects at different levels, we opted for an interpretive epistemology in the tradition of the grounded theory (Strauss & Corbin, 1990): the research strategy involved a two-stage mixed methods approach, We employed (1) case vignettes, for which an on-line semi-structured questionnaire containing both open-ended and closed questions, was used and (2) a group discussion concerning propositions derived from the case studies extended to include issues that the discussants felt were missed out in the case studies.

Cases vignettes

In spring 2018, P-M-A (Austrian Member Association of IPMA) members and project managers found in the university database were invited to participate in an online-based screen-and-keyboard interview. The first part of the semi-structured online questionnaire dealt with uncertainty in a specific project and inquired about the experiences and actions of project managers in this situation. After asking for a free description of the case, this part was structured along two dimensions of consideration: The social dimension asked for actions, decisions and involvement of the project manager, the project team, and other stakeholders and the temporal dimension unfolded along the occurrence of the unexpected: before, during and after the event. Finally, we asked the interviewees to assess whether turbulences could be adequately managed through actions taken. The results of the first part of the interviews were summarized in the form of case vignettes.

A second section focused on the embedding of projects in the organization along the dimensions indicated in the literature (Borgert, 2013; Saunders, 2015). We asked respondents to estimate the amount of project resilience and rate their own organization on 5-point-scales in the dimensions of project design, project communication, sensitivity and awareness, project error culture, project team, and project-oriented culture in the organization. Individual resilience was measured using the RS-11-scale (Schumacher, Leppert, Gunzelmann, Strauß, & Brähler, 2005). In addition, we asked respondents to assess to rate the structural characteristics of the organization in the dimensions of degree of formalization (high – low); distribution of decision-making power (central – decentralized); decision-making process (individual – collegial); information relations (bilateral – multilateral); speed of feedback (fast – slow) and risk-taking (high – low) (Deal & Kennedy, 1982).

Controlling for completeness, richness, and typicality of the cases, we ended up with eight usable vignettes of incidents and companies out of 33 accesses to the online survey, all of which were classified as large companies (more than 250 employees). All respondents have many years of international experience as project managers; most of them have another function in their company in addition to project management. In the end, half of the sample (cases 1 – 4) reported that the organization/project was able to successfully manage the unexpected situation, the other four respondents (cases 5 – 8) felt that the incidents were not managed adequately.

Despite the call for theoretical sampling in qualitative research (Strauss & Corbin, 1990), for practical reasons the responses, and thus the cases, are based on self-selection, which could bias the results. Nevertheless, we have obtained a fairly diverse sample, which makes it possible to discover commonalities and differences and to form project types. The review of the structural variables suggests that the vignettes have exemplary value.

Group discussion

In the moderated group discussions, we wanted to know how well propositions derived from the case studies and literature review would fit a project-oriented organization. Six project managers from the university's practice network were purposefully selected according to the length of their experience (at least 15 years), as well as the industry affiliation, the degree of complexity and the internationality of the projects supervised. There was no overlap in personnel between the survey participants and the discussants.

The moderated group discussion started with a content-oriented input from our side, in which first the previous research findings from the literature and the case vignettes were briefly presented. The main part was then dedicated to an unobtrusively moderated discussion among the participants. Topics on planning, organizational structure and decision-making, individual resilience and organizational culture were discussed. The discussion was supported by mapping the results.

The discussion was video-recorded and resulted in 1 hour 45 minutes of material, which was then (partially) transcribed. The subsequent thematic coding (according to Flick, 2011) was based on pre-established categories derived from literature like organizational structures, planning and preparation, decision making, project orientation, project design, team culture and behavior, practices of action, individual behavior, error handling, tools and methods a.s.o. and supplemented by categories derived from the material. We then identified links between our first-order categories and clustered them into more abstract, second-order themes. Ultimately the case vignettes broken up accordingly, and results of both sources were grouped into a common structure.

4. ESSENTIAL THEMES FOR RESILIENT PROJECT MANAGEMENT

By combining the case studies with the group discussion, seven themes essential for resilient project management can be identified: Formalization and decision-making, project orientation, risk culture, team orientation, error culture, individual resilience, and acting along the timeline. Nevertheless, some categories emerged more in the vignettes or in the discussion; some were clearly addressed in both sources.

Formalization and decision making

In the successful case vignettes, the project design allowed for some flexibility in project objectives, making it easier for the project to respond to unforeseen situations; the same result applies to flexibility in terms of structure and hierarchy. Decision-making authority and the form of decision-making are not uniformly distributed in the positive and negative cases, so it cannot be concluded that a higher or lower level of formalization or centralized or decentralized decision-making processes are fundamentally better for coping with unexpected situation. However, the organizations that reported coping well tended to be characterized by a higher level of formalization combined with more multilateral information relationships. Decision-making power is more centralized, with the project manager deciding alone in most cases, but with information and consultation with the team. Thus, the focus on an individual (vs. collective) decision-making process is rated as equally important in all cases. The decision-making competence has not moved from the hierarchy to the specialists and experts. Furthermore, the vignettes underline that more and open communication is important to manage the unexpected.

The group discussion participants agreed that the organization must give the project team the autonomy to make decisions and take actions (PM1). To this end, the situation must first be properly classified, considering the duration of the project and the various degrees of complexity (PM1, PM2). The group discussion participants found the "triage" tool useful for an initial analysis. The framework recommends, first, to define the situation and the degree of complexity together in the team and, second, to provide standardized procedures ("routines") or in-depth analysis depending on complexity.

In most cases, there is no time for detailed considerations, instead it is necessary to react quickly: "I don't have time to think about this. This has to work." (PM1). In general, long checklists or rational decisions are not considered helpful in situations that require quick action. In contrast, experience, an acquired sense of what to do, and pre-planning considerations are often critical. One participant refers to this combination of planning and gut feeling as "gut knowledge" (PM4), which can be recalled quickly and facilitates improvisation (PM3). After mastery, self-reflection and learning take place: "Was what I assumed right?"; "Am I more relaxed now?" (PM2).

Agility in the project could facilitate dealing with the unexpected (PM3), as this framework provides for making short-term agreements, e.g., with the client, on necessary reactions. Accordingly, this should also be structurally enabled by the organization. Trust is necessary to have sufficient scope for decision-making (PM5). In addition, clearly defined processes are also necessary, e.g., to pass on information in adverse situations (PM1). Ultimately, the organization is responsible for making these processes transparent and ensuring that they are followed.

Project orientation

All organizations in the case vignettes that where successful in adapting to sudden incidents defined themselves as project-oriented, while only one out of four of the unsuccessful cases did. But this may be just an interpretation of the respondents, as we did not explicitly ask for structural or strategical characteristics of project-oriented organizations (PM methodology, PMO, PM standards a.s.o.). Therefore, the study cannot make any statements about the role of structured and formal project management tools. Nevertheless, based on answers to more broad questions all organizations seem to have the appropriate institutions and instruments. This is also reflected in the answers to the request to evaluate different dimensions of a project-oriented culture: only one case in each category consistently indicated low characteristics of project orientation. There is no systematic correlation between successful management of unexpected adverse situations and embedding in a more project-friendly organizational culture, nor better relationships with their stakeholders and environment. However, successful cases showed slightly more flexibility regarding project goals, project hierarchy and structure.

Participants in the group discussion agreed that complete planning is not possible in complex and lengthy projects (PM1) and questioned the common planning orientation in project management. Change is part of project work; projects are characterized by uncertainty. Especially in highly complex projects, one can “expect the unexpected” (PM6). As a result, project managers and the team in long-running, complex projects are better prepared to respond to unforeseen adverse situations.

In complex, longer-term situations, project plans are only rough plans for the whole duration, with a detailed plan only for the first phase (PM3). The team must be made aware that the project and project management methods are “only a framework that reflects the current state of knowledge” (PM5), and that change is an inherent part of project work. The team must understand that the plan is only a snapshot. But plans and other structural project management methods, even if initially perceived as unimportant or just a nuisance, can be helpful when unexpected events occur because project managers can then quickly find solutions.

The impossibility of complete planning must be clearly communicated to the project sponsor (PM3). Excessive expectations on the part of the project sponsor (and sometimes the project owners) must be challenged at the very beginning of the project, especially if they are based on a point-to-point landing or a meticulously executed plan (PM4). One participant reported his positive experience of defining the buffer together with the project owner, thus also holding him accountable. This can also stimulate fruitful discussions about priorities, e.g., that although higher costs are incurred now, ultimately the goal will be achieved cheaper and faster (PM2).

Risk culture

Risk-taking cultures show more features of project resilience than non-risk cultures. Although this could be an artefact given the small number of cases, it is reasonable to assume that a risk-taking culture is associated with more communication, more sensitivity to the environment and more flexible project structures.

In Deal and Kennedy’s (1982) model the dimensions of the degree of risk associated with a company’s key activities and the speed at which companies learn whether their actions and strategies are successful span a 2x2 matrix. In general, the dimension “speed of feedback” proved to be less important than “readiness to take risks”. The answers to the questionnaire allowed the vignettes to be placed in the matrix (Figure 1).

- Process cultures (bureaucracies): Low risk, i.e., errors hardly ever occur, and if they do, they do not cost much. Rules are carefully followed without effective determination and control of success. Two successful cases resemble process cultures.
- Tough-guy, macho cultures: Individualists who like to take risks and get quick feedback on their decisions. This is an all-or-nothing culture where employees are successful, like excitement and work hard to become stars. Four project organizations, half of which are successful cases, can be placed in this quadrant.
- Analytical project cultures (bet-your-company cultures) are characterized by high risk and low or slow feedback. The culture is long-term oriented, and there is a collective belief in the need to plan, prepare well, and execute accurately at all stages. One case studied can be described as an analytical project culture.
- The “Work hard - Play hard” culture is characterized by low risk and quick feedback. Employees in this culture often display high levels of energy and good humor. Stress arises from the amount of work rather than uncertainty. An organization belongs to this type.

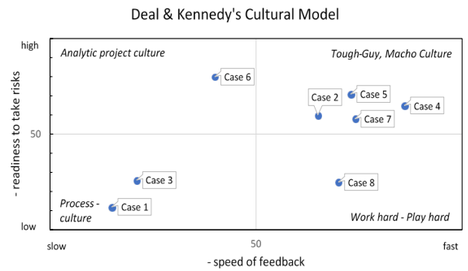

FIGURE 1. POSITION OF CASES IN DEAL AND KENNEDY’S (1982) MODEL (OWN SOURCE)

Slow-response/low-risks and high-risk/fast response cultures managed adverse situations better. Superficially, and considering the small number of cases in the sample, one can assume that both are harmonious cultures, while the others are not: Especially for the analytic project cultures ready to take high risks, environmental feedback and thus signals indicating a need for adjustment arrive too slowly to correct previous courses of action. In general, it is assumed that analytical project cultures have difficulties in dealing with unexpected problems and deviations from the plan and would need much more time to adapt.

At the other extreme - “work hard, play hard” - the project manager and the project team were stressed by conflicting agreements and constantly changing requirements in a very short time. No one was willing to take the leadership role and resist stakeholder demands in favor of smooth project implementation because they were confronted with the need to reorganize structure and process, but at the same time were risk averse.

Team orientation

Project practices depend strongly on the spirit within the project team. Indeed, the culture of project teams differs significantly between vignettes of successful and unsuccessful projects: In resilient projects, diversity of project participants is allowed, even if this may hinder project consensus, the project team is characterized by tolerance towards other opinions and perspectives, and team discussions are based on sharing rather than on defending one’s own position. In both successful and unsuccessful events, project teams are described as very trusting, with project team members relying on each other and the project team living shared values.

In successful cases, reflection and critical debate were welcomed. Feedback is recognized as a valuable tool for management and is actively used, and transparency is lived by all project participants. However, the open communication culture is limited to the relationships within the project. As relationships played a key role in all cases, no difference in active maintenance within the organization and with other important stakeholders could be found. Contact networks existed both in effective and ineffective projects.

Sensitivity and awareness are believed to be central to handle unexpected events. Sensitivity contributed to managing turbulences, especially by noticing and checking weak signals or minor changes and questioning assumptions and values within the project team. While participants in both case groups were willing to accept uncertainty and project crises as an inherent part of projects, sensitivity and awareness were more pronounced in the successful cases, although not consistently so.

Resilience requires flexibility, adaptability, and “sensing” or “awareness” (PM1) and “a continuous mindful sensorium” of necessary changes in the team. This also requires understanding the individual members of the project team and their attitude toward change. Patience and observation are necessary even when quick action is expected (PM2). In the short term, emotional deviations and imbalances must be accepted, and even after the decision has been made, the project manager should also give enough room to the emotions in the team.

At the group level, the project manager must “get a grasp” of the situation and the emotions in the team and quickly move out of “powerlessness” (PM1) to create shared situational awareness with the team. Targeted creativity techniques are needed to make different perceptions and opinions visible. Coming from systemic consulting, circular questioning also seems useful in the process of making diversity of opinion visible. On the other hand, it is important that the project manager is aware of the danger of groupthink in the project team (PM5).

Behind “facts” that are addressed in critical situations, there are ultimately different perspectives and experiences. These can be made fruitful (PM4) by highlighting small hints and directional words that can shed light on background assumptions (PM2). Humble attitudes are helpful: “How can I put things into context relatively quickly when I wasn’t even aware that these things mattered?” (PM1). The discussants also recommend the involvement of mentors and the creation of an appropriate network to provide support when problems arise.

Error culture

In the case vignettes, the open-mindedness and sensitivity within the project teams is reflected in the more appropriated error culture within successful teams. Errors are allowed and are considered as useful feedback, and near-misses are viewed and analyzed as an indication of vulnerabilities. On the downside, procedures and processes are not revised after errors occur in successful cases. It stands to reason whether this is due to the more general culture in the organization or whether employees believe that having successfully “survived” is enough not to fundamentally question processes and procedures.

In terms of an open error culture, it is important that the project management allows the team to make mistakes when acting (PM4) and tries to prevent the emergence of a “culture of fear” (PM6). The absence of sanctions promotes team autonomy and empowerment. However, it must not stop at mere announcements; it is crucial that an open culture is really lived (PM2).

High-reliability organizations and high-performance teams engage in open and regular discussions about mistakes and near misses. Focusing on near misses can help focus on where “it got thin” (PM2), and where control tools are needed. De-briefings are essential to reanalyze the complex social system and question what was critical to (missed) success (PM1). In addition, there is a need for a culture within the project team that is permanently focused

on making different viewpoints visible, accepting different opinions, and playing a key role as a critical commentator, an “advocatus diaboli”.

One obstacle to this is the widespread tendency for everyone to want to protect their own project and the lack of social acceptance to talk openly about problems and mistakes (PM5). In project management, even if very good experiences are reported, there is still a lot of “overconfidence” (PM6); “mental models” are “frozen”, often within the framework of rigid organizational structures (PM2). Therefore, it is important to be aware of the existing mental models of all team members and how they relate to the existing organizational structures. Furthermore, it should be noted that not all team members find it easy to talk openly about mistakes, as this is more difficult for men (PM5) and narcissistic personality types (PM4), for example.

Introducing an open error culture or no-blaming culture carries the risk that great openness can lead to offending those involved (PM5). Assertiveness must therefore be complemented by a sensitive and recipient-oriented attitude in communication. It is important to distinguish between the content level (e.g., consequences for corporate goals, resources, and time) and the personal-emotional level, where empathy and understanding for mistakes can be shown (PM2).

Individual resilience

The RS-11 resilience scale used as in online interviews captures the level of internal resources and their share in the positive handling of events with ease of use and high reliability and validity. In the case vignettes examined, the project managers who have successfully managed to cope with the adverse situation showed a greater resilience (2.7 vs. 3.2 on a 5-point scale). Successful project leaders had significantly better values especially on the following issues:

- If I have plans, I follow them.
- It is important for me to remain interested in many things.
- I can handle several things at the same time.
- I can also overcome myself to do things that I don’t really want to do.
- I have enough energy to do everything I need to do.

Participants of the group discussion consider the development of high individual resilience in project management to be central: “I have to see that I still have options. That I can manage and not be managed.”(PM1).

Of utmost importance is processing one’s own insecurity and own stress. Resilience enables the project manager to be emotionally stable, which in turn enables the project team to be emotionally stable. However, the extent to which one’s own concern can be made visible is debatable: “To what extent do I also communicate my uncertainty, if there is any?” (PM1). This is contrasted by the demand that “the team can see that the project manager always keeps his cool.” (PM4).

The discussants agreed, that “you should not let yourself get off track by the unexpected, because it’s just part of it” (PM5). Rather than lapsing into activities, it has proven useful to adopt an “observer perspective” that also communicates to the team that turbulence is not a dreadful thing, “not a disaster” (PM4). Coping with the unexpected becomes easier with experience, which is why knowledge sharing in the form of mentoring is essential for project managers with less experience. However, experience is in any case one of the most important criteria when selecting project managers for complex projects.

Acting along the timeline

In the case vignettes, successful organizations have succeeded in adapting their management style to the situational requirements. A pronounced structure of the organization, i.e., more formalization of processes and communication, centralized responsibilities, and clarity of tasks, helps in the phase of anticipation, because noticing irregularities is not lost in the noise of unstructured organizational events and, moreover, a clear sense of responsibility can be localized among decision-makers.

Successful project managers involve their team in the coping phase for identification and analysis as well as in preparing decisions in unexpected adverse situations. Then, a relatively flat hierarchy and team empowerment are prevalent. In this phase, it is particularly important that the different approaches and perspectives of the team members are considered to minimize the ‘blind spots’ of the organization. Ideally, this phase result in a shared situational understanding of the project status and a consistent sense-making.

Once a decision has been made on how to proceed to deal with the unexpected, successful organizations manage to return to formalized hierarchy and clear communication structures. Rapid coordinated action as well as clear instructions from the management require intensive, but at the same time very specific, selective communication, which is achieved through clear, bilateral communication structures and a common language.

In line with the results of the case vignettes, the panelists in the group discussion formulated different measures depending on the phases. Fir identification and analysis, team empowerment and diversity of opinion improve decision-making. The panelists emphasized that it is the project manager’s job to consider different approaches and perspectives as a jointly developed situational awareness among team members, as these perspectives can add value in the decision-making phase. In addition, it is the project leader’s job to balance the different personalities and reactions of team members while promoting self-confidence and stabilizing the emotional situation. After decision in the coping phase, clear, centralized communication and leadership improves the outcome. In the adaption phase, a self-reflection and learning process should be initiated to better understand what happened in retrospect.

5. MULTILEVEL RESILIENT PROJECT MANAGEMENT

In the debate on resilience, reference is often made to a multilevel model that corresponds to the classic tripartite division of the organization-group-individual-schema supplemented by the level of the project (Naderpajouh et al., 2020). The discussion of the results also follows this classification and at the same time refers to the propositions originally established in the literature.

However, there is a caveat to be made here: The levels are ultimately not separable, but the design of one has clear implications for the others. The same applies to the categories in general, as each can be seen as a precursor or result of the other. Mutual reinforcement effects are therefore to be expected. This point illustrates the claim that resilience cannot be seen as an isolated part of (re)actions against adverse circumstances but must be understood in an overall picture.

Organizational level

In line with sense making approaches (Weick, 1988, 1995), the unexpected emerges primarily from its internal way of observing the environment, i.e., because fundamental assumptions or expectations of the organization have become “blind spots”. In the cases, for example, process cultures were challenged by new and rapidly implemented regulations and the loss of clear direction. Tough-guy cultures took risks - more or less consciously - based on poorly defined project missions, and analytical project cultures struggled to manage unexpected problems and schedule slippage.

When it comes to flexible decision-making processes, the cases contradict some stances in literature (e.g., Borgert, 2013). Successful organizations were generally characterized by a higher formalization grade, and decision-making power was more centralized. Contrary to Weick and Sutcliffe’s (2007), claim to let decision-making migrate to the people who have the most expertise to deal with the problem, most decisions in successful cases were taken by the project manager alone, albeit after consulting with the team, and specialists and experts were not involved in the cases more than needed.

Addresses primarily the project sponsor empirical results call for stakeholders to be involved in resolving instability. This requires established communication with (external) stakeholders before turbulence begins and is linked to clear project goals and benefits. Project managers actively cultivate relationships within the organization and with key stakeholders outside the organization, a task confirmed by the statements in the group discussion.

Project level

Project managers have confirmed that complex projects fail in completely planning of processes. Planning is a permanent task and involves only preliminary answers that have to be specified and adapted in the course of the rollout (Blomquist, Hällgren, Nilsson, & Söderholm, 2010; Perminova, Gustafsson, & Wikström, 2008). The more project managers disassociate themselves from the idea of fully predictable situations, the more successful they become in dealing with jolts and insecurity. Despite skepticism about the effectiveness of plans to meet expectations of coping with the unexpected, respondents continue to consider planning necessary. Planning defines a (collective) understanding of the project and prepares the participants for different scenarios that can be used in an emergency. Considerations mentioned include the possibility of building up “organizational slack” (resources, time), “conceptual slack”, and the situational elasticity of linking planning to current developments and experience-based routines and heuristics (Nachbagauer, 2021).

To be able to act quickly in an adverse situation, cumbersome and rational decision-making procedures often do not work; established routines can even be obstacles in dealing with the unexpected shocks. At the same time, arrangements such as established communication channels, are valued. Similarly, structured decision models are seen as very valuable, while checklists are rejected. This supposed

contradiction can be resolved by two considerations. First, tools are understood as mere guides to meaningful action if these are kept open for the current situation. Tools mentioned in the discussions do not make any substantive statements, as is common with checklists in medicine or aviation. Rather, they only mark necessary stages in the decision process without marking preferred directions on how to decide. Secondly, it is recognized that the perception and interpretation of facts is significantly influenced by different perspectives and experiences: What matters is what one brings “into” the decision-making pipeline. For project management tools, this means that they are useful if they describe issues that need to be considered, but do not prescribe what is “better” in terms of content.

The cases emphasize adaptable project objectives, and flexible structures and hierarchies in line with previous research (Geraldi et al., 2010; Maylor & Turner, 2017). The management of adversaries succeeded in those organizations that adapted their management style to the situation requirements. They were flexible and involved the team in the coping phase, and re-established efficient, organized, and centralized communication especially after decision-making. Goal orientation and clarity within the organization prevailed. In line with theoretical considerations, autonomous decisions at the project level are possible precisely because they are based on undisputed organizational structures such as communication channels and hierarchies, knowledge of the participants, trust, and clarity of strategic goals (Nachbagauer & Schirl-Böck, 2018). In the group discussion the findings were confirmed and supplemented by considerations on the project manager’s job to balance the different personalities and reactions of team members and to developed situational awareness among team members in the coping phase.

Team level

Literature stresses the importance of a positive team culture (Borgert, 2013; Maylor & Turner, 2017; Saunders, 2015). The team should be encouraged to discuss and negotiate its way to action matching the specific project situation. Reflection and critical debates are crucial, and they take advantage of the diversity of the project participants and multilateral information relations.

Resilient teams are characterized by tolerance towards other opinions and perspectives. Feedback is acknowledged as an important and helpful tool for management and most decisions in successful cases are taken after consulting the team. The assumption that a greater degree of forgiveness and active engagement with mistakes in the project team and in the organization increases successful handling of the unexpected and uncertainty is confirmed. However, for this positive attitude to take effect, it is necessary to build a corresponding culture of trust, an undertaking that poses many challenges, especially in the project (management) context.

Results pointed out the significance of a positive error culture. Because one’s own knowledge and assumptions are reinforced in adverse situations, correction through team processes is important. A better understanding of the situation can often only be achieved by a diverse team with different views and approaches. Team situation awareness enables the team to understand the initial situation in a common picture, to make appropriate assumptions and to take the measures that the new situation requires (Salas, Prince, Baker, & Shrestha, 1995). Learning from what happened when confronted with the unexpected with the unexpected requires an organizational and team culture that allows people to talk about mistakes and failures rather than hide them, a culture in which mistakes are accepted. Mindfulness requires people to focus on failures rather than successes, and to realize that others can know more than you can (Barton & Sutcliffe, 2010; Weick & Sutcliffe, 2007).

Individual level

Smart project managers and project teams succeed in regularly challenging familiar routines. In complex projects, this is even more successful because project managers tend to expect the unexpected, whereas in simpler contexts, they tend to stick to the trained routines for longer. Promising success is a high level of attention to deviations and a detachment from previous experiences. Therefore, the connection of clear decision-making structures with experience and heuristics is required, as the term “gut knowledge” coined by a participant, expresses very nicely.

Regardless of organizational culture, high-level decision-making rules do not rest with the team, but with the project manager. And contrary to empowering conceptions recently brought forward (Malik, Sarwar, & Orr, 2021; Yu, Vaagaasar, Müller, Wang, & Zhu, 2018), the need for leadership in turbulent times and the urge to take over responsibility seems to be more important than shared decision-making and participation. However, for this to happen, project leaders first need to be able to organize themselves well. So above all, they need to get a grip on their own fears and stress. Individual resilience is crucial for successfully coping with unfavorable situations, enables managers to play an active role and provides emotional stability for the project team.

Resilience in our sample is also associated with a kind of “cool” management behavior. The project manager needs to be primarily focused on making purposeful decisions, be able to multi-task, and be energetic even when faced with unpopular decisions and tasks. Evidently, in unfavorable times, managers may have to make decisions that go against the interests of others, sometimes even their team.

Notably, successful project managers tend to be risk adverse. One of the recommendations was to “significantly reduce risk appetite”. While all projects were ready to accept turbulences or even crisis as normal in projects, reactions in successful accomplishment of incidents were slow - at least there was no frantic “’activism”. Even if urgency is an issue, successful project manager did not react too quickly and rashly. When asked for recommendations on how to cope with surprising and turbulences, most project managers mentioned themes such as: “keep calm”, “keep a cool head” and “take time to reflect and plan”. However, as soon as a decision has been made on what needs to be done after the disruption and reflection, a quick reaction and unquestioning leadership is required.

6. CONCLUSION

Findings from case reports and the group discussion show several systematic links between successfully dealing with the unexpected and characteristics normally attributed to resilient projects, i.e., environmental orientation, sensitivity and mindfulness, higher willingness to accept diversity and equality in the team and multilateral information relationships. They are alert to deviations, slow down their actions to better and more fully understand problems, and are less attached to the past. Organizational and team resilience relies on the individual resilience of project managers. On the other hand, successful organizations are characterized by a higher degree of formalization, decision-making is centralized and more individualistic.

Recently Naderpajouh et al. (2020, p. 3) argued for resilience to be seen as “an attribute or ability of the system (or more accurately its performance) to sustain and thrive in the face of variations”, emphasizing the performative aspect over trait of a system. The results of the present study support this approach: successful project-oriented organizations are neither more rigid nor more unstructured than others per se. Rather, they use the characteristics usually attributed to them more intelligently and flexibly along the time axis from incubation and precursor events to analysis, decision-making and recovery. Results emphasizes the importance of preparation and awareness. With confrontation and analysis, successful project managers preferred slow reactions, kept calm, took time to reflect, and involved the team. However, once decisions on action were made, smart organizations quickly move to quick and coordinated, albeit cautious, action in the recovery phase. Moreover, it was not the complex projects that were most likely to fail. Rather, project managers of complex projects appear to be better prepared to deal with shocks. Simply put, they are more willing to expect the unexpected, whereas in simpler contexts they may stick to their well-rehearsed routines for too long.

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