PROJECT RECOVERY:

PROJECT FAILURES AND HOW TO GET RID OF THEM

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Abstract: Since the 1960s, project success has been receiving much interest from both academics and practitioners. Despite these efforts, project failure is still a recurring and prevalent phenomenon. In both peer-reviewed and non-peer-reviewed project management literature, a great deal of studies generates lists of success factors and failure causes. Few studies, however, investigate concrete recovery strategies to bring failing projects back on track. The present article, therefore, draws upon the literature on critical success factors and project recovery frameworks to construct an eight-step action plan that helps in recovering from project failure. The recovery action plan was awarded the University Contest by PMI Belgium in 2019.

1. INTRODUCTION

Project failures are expensive, therefore, both companies and researchers are trying to grasp which initiatives are necessary to deliver successful projects (e.g., Cooke-Davies, 2002; Jugdev & Müller, 2005). Multiple studies in project management literature compose sets of success factors and/or failure causes (e.g., Belassi & Tukel, 1996). A minority of studies, however, explores specific actions to recover troubled projects (e.g., Aiyer, Rajkumar & Havelka, 2005). For this paper, a recovery action plan is created to recuperate from the occurrence of project failure during the execution phase of the of the project life cycle, which is represented in **Figure 1** (picture taken from Vanhoucke, 2012).

Support for this recovery action plan is found in the literature concerning critical success factors and project recovery strategies. Critical success factors are variables that can have a significant impact on project success (Alias, Zawawi, Yusof, & Aris, 2014). By emphasizing the critical success factors during project recovery, project failures can be avoided. Project recovery frameworks encompass specific actions to bring troubled projects back on track.

The paper is structured as follows. Section 2 covers the literature review. It presents statistics on project success and project failure, defines project success and project failure, introduces critical success factors, and presents project recovery strategies. In section 3,

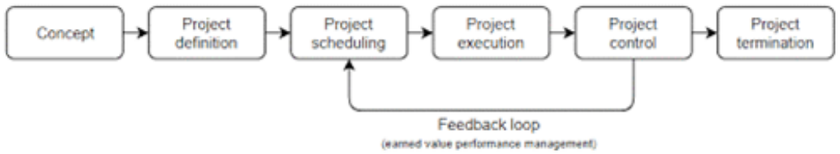

Figure 1: Project life cycle

our eight-step recovery action plan is introduced and discussed. Finally, the article is concluded in section 4.

2. LITERATURE REVIEW

2.1. Statistics

The decision to focus on project failures is based upon information from the CHAOS reports of the Standish Group. The graph in **Figure 2** summarizes key statistics on project success and project failure retrieved from the CHAOS reports from 1994 until 2012 (The Standish Group, 2007, 2011, 2012, 2013).

Regrettably, even though research on project success and projects, in general, is rapidly increasing over the years, it can be seen that project managers have not yet succeeded in consistently delivering more successful projects as the share of successful projects has not risen steadily and the share of challenging projects has not declined steadily for the period under consideration.

To get a complete understanding of the graph, it is important to indicate the underlying definitions. The Standish Group considers a project a success if it is completed on time, within budget and with all features and functions as initially specified. The category "challenged projects" refers to projects completed but over the budget and time estimate, and with fewer features and functions than initially specified. The final category distinguished by The Standish Group is "failed projects". This category refers to projects that are canceled during the project life cycle.

2.2. Project success and project failure

Project management is the planning, organization, monitoring and control of all aspects of a project, with the motivation to achieve project goals in a safe manner, within the agreed schedule, budget and performance criteria (International Project Management Association, 2006). In general, project management literature advocates that project management has three major objectives: a project must be completed on time (1), within budget (2), and according to the performance specifications (3) (e.g., de Wit, 1988). This "iron triangle" model of project success focuses on short-term dimensions, i.e., time, cost, and scope. The Standish Group thus analyses projects based upon this definition of project success, stating that a project is a success if it is completed on time, on budget and according to the initial performance specifications.

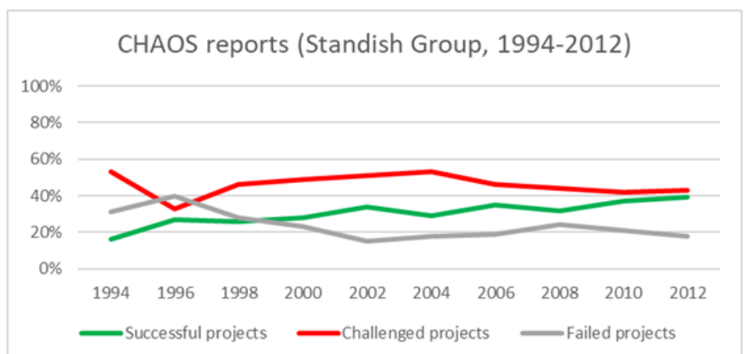

Figure 2: Overview CHAOS reports (The Standish Group, 1994-2012)

As this paper covers the topic of setting up a recovery action plan in case of project failure, a clear definition of a project failure is needed. This, however, proves to be a more difficult undertaking. Firstly, in project management literature, there exist varying definitions of project success and consequently of project failure (Belassi & Tuckel, 1996; Linberg, 1999). Secondly, "success is both subjective and objective" (Morris & Hough, 1987, as cited in Jugdev & Müller, 2005, p. 25). Given that projects involve different stakeholders, success may be interpreted differently among these stakeholders (Pinto & Slevin, 1988). As a result, there can be ambiguity in determining whether a project is a success or a failure (Belassi & Tuckel, 1996; Kerzner, 2011; Al-Hajj & Zraunig, 2018). Lastly, success "varies across the project and product life cycle" (Morris and Hough, 1987, as cited in Jugdev & Müller, 2005, p. 25). After screening the literature, it was clear that most definitions and statistics follow the "iron triangle" model and use time, costs and scope to distinguish successful projects from unsuccessful projects (Belassi & Tukel, 1996; Cavarec, 2012). In what follows, we will consider a project a failure if at least one of the following three constraints is fulfilled: the project is delivered significantly behind schedule (1), drastically over budget (2), and without meeting specifications (3) (Whittaker, 1999; Aiyer, Rajkumar & Havelka, 2005). Note that our definition of failed projects thus deviates from The Standish Group definition of failed projects because it aligns with The Standish Group definition of challenged projects.

2.3. Critical success factors

In the project success and project failure research field, critical success factors (CSFs) are indispensable. CSFs are "elements required to create an environment where projects are managed consistently with excellence" (Kerzner, 1987, as cited in Jugdev & Müller 2005, p. 24). The link between CSFs and project failure is depicted in Figure 3. CSFs significantly impact the project outcomes, which in turn might result in a need for project recovery in the case of unsatisfactory expected project outcomes.

Exhaustively listing the critical factors of project success, however, is not an easy task. Plenty of studies focus on the factors that affect project success or project failure. Many of these studies construct a list of different CSFs (Clarke, 1999; Pinto & Slevin, 1988). The purpose of this paper, however, is not to come up with a complete overview of all possible CSFs, but to show that accounting for CSFs can already lead to major steps forward in terms of project recovery. Therefore, we use the thorough overview of CSFs (based on 63 publications addressing CSFs) made by Fortune and White (2006)* to classify CSFs in three categories: qualitative factors (1), quantitative factors (2), and a residual category (3). Our categorization is in line with the one from Radujković and Sjekavica (2017) and the one from Chan, Scott, and Chan (2004). The former suggested three categories of CSFs: elements of project management competence (1), elements of organization (2), elements of project management methodologies, methods, tools and techniques (3).

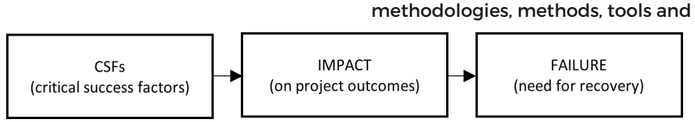

Figure 3: The link between CSFs and project failure

** Articles since 2006 were also considered but it can be concluded that the list by Fortune and White is general and comprehensive so that no additional CSFs need to be included.*

The latter distinguishes between five categories of CSFs: human-related factors (1), project-related factors (2), project procedures (3), project management actions (4) and external environment (5).

In the next three subsections, we shortly discuss the three CSF categories and the corresponding CSFs from the paper by Fortune and White (2006). Typically, a combination of factors in different stages of the project life cycle results in project success or failure (Montequin, Cousillas, Alvareza, & Villanueva, 2016). Throughout the paper, we do not prioritize among the CSFs because the relative importance of CSFs is different from project to project and from industry to industry. Later in this paper, these categories and factors will be linked to the recovery action plan for preventing projects from ultimate project failure.

2.3.1. Qualitative category

The qualitative category includes all factors related to soft skills. The Cambridge Dictionary defines soft skills as "people's abilities to communicate with each other and work well together" (Cambridge Dictionary, n.d.). As mentioned in part 2.2, project success is about achieving the predetermined goals within time and budget. People skills are playing a very central role as they will have an impact on how people are able to work together efficiently and effectively. Of the 27 different CSFs identified by Fortune and White (2006), seven are classified into the qualitative category. In the following paragraph we shortly discuss them.

1. Good leadership: A project manager does not necessarily have good leadership skills. These leadership skills (e.g., the ability to communicate effectively, motivate others, make decisions), however, are crucial to deliver a project successfully (Odusami, Iyabaga, & Omirin, 2002).

2. Competent project manager: It goes without saying that the project manager should have the skills or knowledge to bring the project to a good end.

3. Good communication/feedback: One of the key steps in effective project communication is to ensure that the communication is not left orphaned. Project managers are typically focused on the key project activities, often leading to neglect of the issues related to communication. A study of Wu, Liu, Zhao, and Zuo (2017) proves the necessity to enhance the communication among different team members as it is positively correlated to project success.

4. User/client involvement: Multiple reports by The Standish Group (2007, 2011) disclose that user or client involvement is the principal cause of project failure. This CSF highlights the skills of the project team members to work well with others – the client for which the project is being performed – and is therefore assigned to the qualitative category. Both communicating to and getting feedback from the client are important to improve a project (Wateridge, 1995).

5. Skilled/suitably qualified/sufficient staff/team: Having a qualified team is indispensable to bring a project to a successful end as the project team will shape the implementation of the project (Munns & Bjeirmi, 1996). Pant and Baroudi (2007) confirm the importance of qualified teams as they state that managing projects successfully requires a mixture of different skills.

6. Effective change management: During the project life cycle, there is a lot of uncertainty. As a result, unexpected developments will occur, and they need to be handled appropriately (Cash & Cox, 1992).

7. Training provision: The last factor in the qualitative category is training provision. All members of the project team should be trained adequately (Pinto & Kharbanda, 1996). If new knowledge and skills are required during the project life cycle, training should be provided on time.

2.3.2. Quantitative category

The quantitative category includes all success factors related to process aspects of project management. Nine out of the 27 CSFs listed in the paper by Fortune and White (2006) can be assigned to this second category. In the following paragraph we shortly clarify them.

1. Strong business case/sound basis for the project: An inadequate or non-existent business case can result in suboptimal project outcomes (e.g., unclear scope, time, and cost overruns) (Whittaker, 1999; Larson & Larson, 2011). Therefore, organizations should invest time in creating a strong business case from the start of the project.

2. Sufficient/well-allocated resources: From materials to personnel, resources are vital during the project life cycle. Lacking resources – because of for example, insufficient planning or unforeseen events – may turn out to be detrimental for successful project completion. Therefore, it is important that from the start of the project, attention is given to the allocation of resources and that during the project life cycle, the project team handles resources as flexibly as possible.

3. Realistic schedule: Based upon her empirical research, Whittaker (1999, p. 24) stated that "failure by overrunning schedule was by far the most common". Therefore, the project manager and the project team can benefit from starting with a realistic schedule including realistic data and random events (e.g., external delays, rework) (Mejía et al., 2016).

4. Clear realistic objectives: Clear realistic objectives is the second most frequently cited CSF according to the review of Fortune & White (2006). Setting well-defined and reasonable objectives, however, is a complex skill. In practice this is often realized by making use of the S.M.A.R.T. acronym for project goals (Specific, Measurable, Achievable, Relevant, Time-bound) (Bowman et al., 2015).

5. Strong/detailed plan kept up to date: A well-informed project plan of good quality is stated as third most frequently cited CSF by Fortune & White (2006). A schedule is a prediction of what comes but in reality, things will be different. The progress of the project is compared to the baseline schedule, which is the point of reference for risk analysis and project control. If things go wrong, the schedule has to be updated (Vanhoucke, 2012).

6. Risks addressed/assessed/managed: The context in which projects occur is uncertain and when there is uncertainty, risk management comes into the picture. Risk management is both static and dynamic and consequently, risk management should be given attention during the entire project life cycle (Vanhoucke, 2012). The analysis of the risk is static, it is done before the start of the project execution. However, the real risk only strikes in the dynamic phase, things only go wrong during project execution and the project manager and the project team should be able to act appropriately when things tend to go wrong.

7. Effective monitoring/control: Project control, defined as the act of measuring and monitoring project progress to detect deviations from the expected project schedule and take corrective actions to bring projects back on track, is considered one of the three crucial dimensions of dynamic scheduling (Vanhoucke, 2012).

8. Adequate budget: Much like sufficient resources in general (cf., supra), sufficient financial resources should be allocated to the project to ensure successful project completion.

9. Planned close down/review/acceptance of possible failure: Organizations should investigate various scenarios of the project execution, among others a best-case scenario and a worst-case scenario. Based on this, organizations should draw conclusions and decide upon when and how to abandon the project.

2.3.3. Residual category

Factors that cannot (fully) be controlled by the project team are classified in the residual category. All eleven resulting CSFs listed in the paper of Fortune and White (2006) belong to this category. A concise explanation of this classification can be found in the next paragraph.

1. Support from senior management: Successful projects typically have a committed senior management that is willing to for example, provide the necessary resources and authority for project

success (Pinto & Slevin, 1988; Whittaker, 1999; The Standish Group, 2011). Even more, this CSF is the most frequently cited CSF in the paper by Fortune & White (2006) and Young and Jordan (2008, p. 714) prove that "top management support is the most important critical success factor for project success". The project manager and the project team often have little to no influence on senior management. For this reason, support from senior management is included in the residual category.

2. Proven/familiar technology: During the project life cycle, the project team will often make use of (external) technologies that are not (completely) under its control. Furthermore, these technologies might be novel and might result in technical failures (Pinto & Kharbanda, 1996).

3. Project sponsor/champion: The presence of a committed project sponsor is by several researchers considered one of the most important factors for project success (Cash & Fox, 1992). The project sponsor has the final say, so the project team is not (entirely) in control of this entity.

4. Good performance by suppliers / contractors / consultants: The work conducted by suppliers, contractors, consultants cannot (fully) be influenced by the project manager and his team.

5. Political stability: Damoah, Akwei, Amoako, and Botchie (2018) show that corruption impacts the failure of government projects in developing countries. Thus, the political landscape can influence project success.

6. Correct choice/past experience of project management methodology/tools: Often, multiple project management methodologies/tools are considered to be suitable for the project at hand. Different project management methodologies/tools, however, can result in different project schedules. The choice of the methodology/tool thus plays a key role in the resulting project execution.

7. Environmental influence: Projects can also be heavily challenged by their environment (e.g., heavy rainfall, competitor's actions).

8. Past experience: Furthermore, past experience of the project team is given and cannot be changed during the project life cycle.

9. Project size: For this paper, we consider the project size, level of complexity, number of people involved, and project duration to be given and non-negotiable which means that this CSF also belongs in the residual category.

10. Different viewpoints (appreciating): In different stages of the project life cycle, different perspectives can be taken. Important here is that team members are open-minded and consider alternative approaches before deciding upon the final path to project delivery.

11. Organisational adaptation/culture/structure: As various stakeholders are involved in the project, diverse cultures and structures may clash (e.g., miscommunication). Attention should be given to the mix of cultures/structures so that all entities can adapt if necessary and ultimately work together in harmony.

2.4. Project recovery

Given the aforementioned CSFs and bearing in mind that a lack of these factors may lead to project failure, the importance of (specific actions for) project recovery becomes apparent. It is, however, impossible to focus on all existing CSFs. Instead, the effective management of a subset of CSFs is a prerequisite for project success (Frefer, Mahmoud, Haleema, & Almamlook, 2018). To still ensure the successful completion of projects that are missing out some CSFs, project recovery must be considered (Havelka & Rajkumar, 2006). Following the definition of van den Berg (2012), recovered projects are "projects that have deviated past the acceptable thresholds, but due to interventions, the project objectives have been recovered to an appropriate level to still provide acceptable benefits to the stakeholders". Hence, a deviation from the acceptable thresholds can be subjected to a recovery process (i.e., interventions) to ensure project success.

As depicted in **Figure 4**, several steps may precede the actual recovery process (Kerzner, 2011). Both the control and detect phases can be considered as meaningful predecessors for the need for actions, i.e., project recovery. First of all, during the control phase of the project management life cycle (see section 1), the project team measures and monitors the project progress to check whether the deliverables – in terms of being on time, within budget, and according to the performance specifications (de Wit, 1988) – are conform the expected project progress and the client expectations (Vanhoucke, 2012; Villanova University, 2019). During this control stage, different variations may be tracked, and they can become suitable key focus points for project recovery later on. Secondly, early warning signs may already indicate troubles during project execution (e.g., missed milestones). Early warning signs are "signals, which can be seen variously as an expression, indication, a proof or a sign of the existence of some future negative issues" (Othman, Ghani, Mohamad, Alalou, & Shafiq, 2018, p. 1). Havelka and Rajkumar (2006) confirm that the sooner the problems are detected, i.e. the sooner early warning signs pop up, the greater the chance of project success or project recovery. Hence, the timing of the problem detection will become a crucial factor to guarantee successful project recovery. Therefore, the project manager and every member of the project team should be alert for warning signs and should recognize the signs indicating problems as soon as possible to take appropriate actions during the recovery process.

To perform the project recovery, few frameworks or strategies exist. We first highlight the "troubled project recovery framework" which is developed by academics to recover and rehabilitate Information System development projects (Aiyer, Rajkumar & Havelka, 2005). Next, we present the eight actions suggested by Keil and Robey (1999) to get escalating software projects back on track. Both strategies can, however, also be used for projects other than information system projects because they are described in general terms. Finally, we refer to Vanhoucke (2012), who distinguishes three dimensions of dynamic scheduling in project management to deliver projects on time, within budget and according to specifications. Many features of these recovery strategies are formulated in response to the CSFs (see section 2.3.).

2.4.1. Troubled project recovery framework

A distinction can be made between the framework itself and some general control systems on which the strategy to get the project back on track relies. Havelka and Rajkumar (2006) highlight crisis management and escalation of commitment as general control systems. The first concept, crisis management, can be defined as "a set of guidelines regarding the effective assessment, response, mitigation, and relief of crisis" (Seeger & Ulmer, 2001). This management approach consists of skills and techniques required to identify, assess, understand, and cope with a crisis. Ultimately, crisis management aims at "reducing the impact of the crisis on both the organization and stakeholders" (Seeger & Ulmer, 2001). Recovery strategies tend to use the knowledge of this field early on in the recovery process. The second concept, escalation of commitment, refers to "the tendency for decision-makers to persist with failing courses of action" (Brockner, 1992). In other words, people who are confronted with negative outcomes of a decision or action nevertheless continue with the same behavior rather than alter their course. Project leaders can be inclined to add

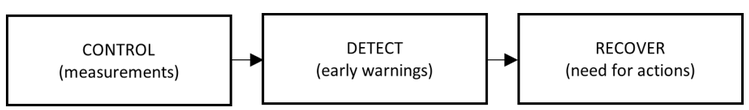

Figure 4: Anticipation flow for project recovery

resources (e.g., money, people, machines) to save the project outcomes. But this is not always the most appropriate response. It is important to be aware of this behavioral pattern. The authors strongly believe that both crisis management and de-escalation of commitment are important concepts in the set-up of their recovery framework. The "troubled project recovery framework" consists of four stages (recognition, immediate recovery, sustained recovery and maturity) and each stage furthermore consists of actions (12 in total).

Stage 1: Recognition: The first step in this stage is "awareness". The sooner the problem is acknowledged (cf., warning signs), the higher the probability of successful project recovery (Havelka & Rajkumar, 2006). The next step in the recognition stage is "admission". Admitting that the project is troubled is crucial to go over to actions to bring the project back on track. Here, the concept of escalation of commitment comes into play. Project managers often recognize early warnings, but then ignore them. The "assessment" step, the third step in the recognition stage, refers to conducting an objective assessment and review of the project progress. Project projections should be compared to actual achievements. What exactly is concerning? The final step, "decision", refers to deciding upon whether to continue with the project and to find solutions to the occurring difficulties to get a satisfactory project outcome, or to cancel the project.

Stage 2: Immediate recovery: In the "immediate recovery" stage, the most pressing problems are filtered out and corrective actions are taken immediately. Here, it is not the intention to completely rearrange the project, only acute complications are targeted. The isolation of the most pressing problems occurs in the "triage" step. Next, suitable treatment actions are determined for each of these problems in the "treatment" step.

Stage 3: Sustained recovery: The "sustained recovery" stage consists of the steps "analyse", "revise", and "execute". Once the most critical problems are tackled with short-term decisions and actions, long-term decisions and actions come into play. The sustained recovery stage starts with the analysis of the project status and the creation of an issue list and possible solutions for each of the issues in the list. The next step is the revision of the baseline schedule, taking into account new or alternate activities in the project execution. Finally, the revised plan is executed and continuously monitored.

Stage 4: Maturity: The final stage of the "troubled project recovery framework" aims at learning from past failures. This stage involves the steps "document", "propagate", and "implement". First, lessons learned should be documented. Next, the project management knowledge should propagate throughout the organisation. Finally, this cumulated knowledge should be implemented in other projects.

2.4.2. De-escalation actions

Keil and Robey (1999) list eight categories of action to turn troubled projects around.

1. Redefine the project: Redefining the project refers to giving reason for the project, redefining the project scope, warranting financial support, and highlighting the most critical features.

2. Improve project management: Improving project management refers to more checks and controls (e.g., more regular assessments of the project progress, more project team meetings) and as such addresses the quantitative CSF "effective monitoring/control".

3. Change in project leadership: Changing project leadership involves ensuring that the project is led by a competent project leader (e.g., taking on an external project manager) and consequently, this action is formulated in direct response to the qualitative CSF "competent project manager".

4. Subdivide the project: Subdividing the project entails breaking down the entire project into smaller pieces of work that can be worked on independently (e.g., dividing the target market).

5. Resolve specific problems: Keil and Robey (1999) emphasize external relationships and technical issues as specific problems that need to be tackled to ensure project success.

6. Adding and/or removing resources: It is not guaranteed that continuously adding resources to a project ensures satisfactory project outcomes. The provision of resources should be cautiously examined (e.g., quality, quantity, timing).

7. Layoff and hiring: This action is closely related to the previous action as people can be considered as human resources. The authors, however, exclusively refer to human resources outside the project (e.g., human resources department, suppliers, customers). This action directly tackles the qualitative CSF "skilled/suitably qualified/sufficient staff/team".

8. Training: Alternatively, to adding and/or removing resources, resources can be trained and ameliorated to turn escalating projects and especially specific aspects of troubled projects around. This action is formulated in direct response to the qualitative CSF "training provision".

2.4.3. Dynamic scheduling

Vanhoucke (2012) introduces three dimensions of dynamic scheduling in project management that play a vital role in every project, and therefore also in a recovery project: baseline scheduling (1), risk analysis (2), and project control (3). These three dimensions require particular attention to deliver projects on time, within budget and according to specifications. The construction of the baseline schedule can be seen as a preparation phase for both the risk analysis and project control phases. The baseline schedule is a timetable that includes the following three elements: the start and finishes time of each project activity (1), the relation between the different activities (2), and the resource constraints (3). This timetable allows predicting the expected time and cost of each individual activity as well as the entire project. The second aspect of dynamic scheduling, risk analysis, is important to highlight the sensitive parts of the baseline schedule. Following these two phases, deviations in the schedule can be corrected during the control phase. Controlling the project is critical to project success, as changes – occurring once the project execution has started – can have a damaging impact on the project outcomes. Consequently, these three dimensions directly deal with the quantitative CSFs "strong/detailed plan kept up to date", "risks addressed/assessed/managed", and "effective monitoring/control", respectively.

Project recovery frameworks are scarce, both in peer-reviewed and non-peer-reviewed contexts. The lack of concrete action plans for project recovery is unfortunate, given the lasting occurrence of project failure (see section 2.1.). Therefore, the next section presents the project recovery action plan that was developed based on our analysis of CSFs.

3. RECOVERY ACTION PLAN

From an analysis of the critical success factors and the project recovery strategies, we derived eight specific steps to get troubled projects back on track. **Table 1** and **Table 2** relate these steps to the critical success factors and the project recovery strategies, respectively. As can be seen, the eight steps still address the vast amount of critical success factors and elements of project recovery.

Together, the eight steps make up a comprehensive recovery action plan (see **Figure 5**). Because the action plan only encompasses eight concrete steps, it is a promising tool for project managers and project teams facing project failure and intending project recovery. After being selected first in the Ghent University Contest by the jury of the Project

Management Institute (PMI) Belgium, this action plan was presented at the PMI Chapter Event (25th of April 2019, Belgium) and awarded the Project Management Award. Project managers present at this event indeed considered the concrete action plan a useful roadmap on the road to successful project recovery.

In **Table 1**, all eight steps of the recovery action plan are linked to the critical success factors. The qualitative CSFs are largely accounted for by steps 3 and 8 (reallocate the project resources and keep on communicating). The quantitative CSFs are closely linked to the dimensions of dynamic scheduling and are mainly accounted for by steps 4, 5 and 6 (redraft the project planning, analyse the risk and monitor the project). None of the steps in the action plan tackle the residual CSFs because this category of CSFs cannot (fully) be controlled by the project manager and the project team.

In **Table 2**, the eight steps are related to the project recovery elements of this paper. Considering that communication might also be beneficial for cumulating and propagating knowledge (cf., stage 4 of the troubled project recovery framework), the plan directly addresses all but two of the elements. The second stage of the troubled project recovery framework (immediate recovery) and the fifth de-escalation action (resolve specific problems) are indirectly addressed because specific problems are the input for the third and fourth steps we propose (reallocating the project resources and redrafting the project plan).

Figure 5: Step 1: Rethink the business case: First of all, even before considering project recovery, take a step back and critically reflect on the business objectives of your firm. If these objectives are clear, you should check whether or not the project fits with them or not. If not, you should not even start with the project recovery. In short, do not always recover the project, rethink the business case.

Table 1: Critical success factors for the recovery action plan

		3. Recovery action plan							
		Step 1: Rethink the business case	**Step 2: Redefine the project**	**Step 3: Reallocate the resources**	**Step 4: Redraft the planning**	**Step 5: Analyze the risk**	**Step 6: Monitor the project**	**Step 7: Abandon the project if necessary**	**Step 8: Keep on communicating**
2.3. Critical success factors	**2.3.1. Qualitative critical success factors**								
	1. Good leadership			X					
	2. Competent project manager			X					
	3. Good communication/feedback								X
	4. User / client involvement			X					
	5. Skilled / suitably qualified / sufficient staff / team			X					
	6. Effective change management								X
	7. Training provision			X					
	2.3.2. Quantitative critical success factors								
	1. Strong business case / sound basis for project	X							
	2. Sufficient / well allocated resources			X					
	3. Realistic schedule				X				
	4. Clear realistic objectives		X						
	5. Strong / detailed plan kept up to date				X				
	6. Risks addressed / assessed / managed					X			
	7. Effective monitoring / control						X		
	8. Adequate budget			X					
	9. Planned close down / review / acceptance of possible failure							X	
	2.3.3. Residual critical success factors								
	Note. The ten residual CSFs cannot (fully) be controlled by the project manager and the project team, therefore they are not included in this table.								

Figure 4: Anticipation flow for project recovery

Table 2: Project recovery elements for the recovery action plan

		3. Recovery action plan							
		Step 1: Rethink the business case	**Step 2: Redefine the project**	**Step 3: Reallocate the resources**	**Step 4: Redraft the planning**	**Step 5: Analyze the risk**	**Step 6: Monitor the project**	**Step 7: Abandon the project if necessary**	**Step 8: Keep on communicating**
2.4. Project recovery	**2.4.1. Troubled project recovery framework**								
	Stage 1: Recognition	X							
	Stage 2: Immediate recovery								
	Stage 3: Sustained recovery				X	X	X		
	Stage 4: Maturity								(X)
	2.4.2. De-escalation actions								
	Action 1: Redefine the project		X						
	Action 2: Improve project management						X		
	Action 3: Change in project leadership			X					
	Action 4: Subdivide the project				X				
	Action 5: Resolve specific problems								
	Action 6: Adding and/or removing resources			X					
	Action 7: Layoff and hiring			X					
	Action 8: Training			X					
	2.4.3. Dynamic scheduling								
	Baseline scheduling				X				
	Risk analysis					X			
	Project control						X		

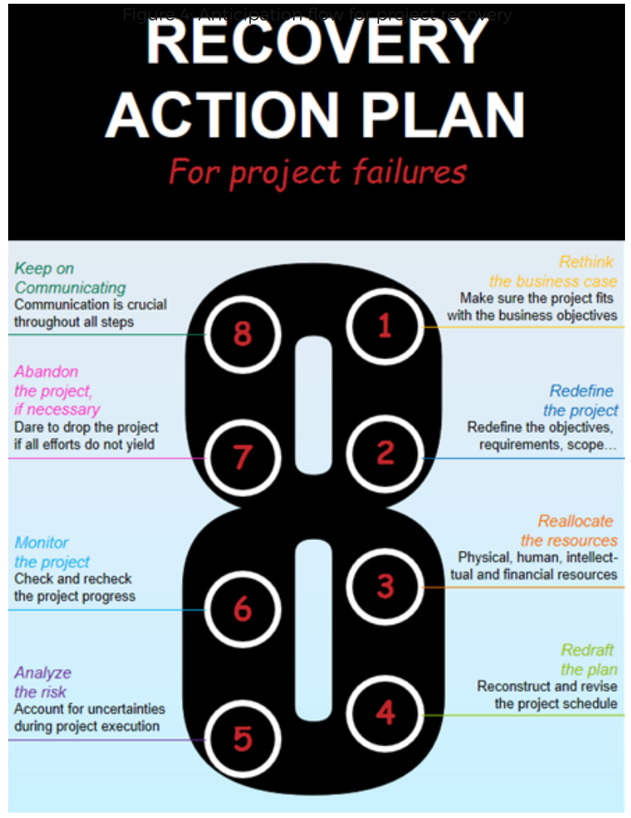

Figure 5: Recovery action plan

Step 2: Redefine the project: The next step encompasses redefining the project. In some cases, this merely requires validating the existing project with more details. In most cases, however, it will be necessary to start from scratch to clearly. In every case, objectives, requirements, scope… should all be redefined clearly in for the project recovery to succeed.

Step 3: Reallocate the resources: Here, project resources refer to physical resources (e.g., machinery, workspace), human resources (the project team), intellectual resources (e.g., databases), and financial resources (the budget). Regarding the project team, decide – for each activity – who is responsible, accountable, consulted, and informed. A multi-disciplinary team is certainly beneficial. Involve all project stakeholders are in the project team and do not forget to include experts.

Step 4: Redraft the plan: Project planning refers to reconstructing a project schedule by indicating clear start and finish times of each activity. Project planning is an important step in the life cycle of any project, and thus also of a recovery project. Rewriting the project schedule should be done during the scheduling stage of the (recovery) project life cycle. Thoroughly following the redrafted schedule and – if necessary – revising the redrafted project plan throughout the execution and control stages of the (recovery) project life cycle is essential.

Step 5: Analyse the risk: Projects face various unforeseen events that involve uncertainties. Things can go wrong during the execution phase of the (recovery) project life cycle (e.g., heavy rainfall, a strike). When there is uncertainty, there is risk that should be analysed and managed. The risk analysis step refers to an assessment of the risk linked to the redrafted project schedule. The project plan acts as a point of reference for the risk analysis. By predicting the impact of uncertainties on the initial expected project timing and budget, the project schedule can be adjusted to bring the project back on track.

Step 6: Monitor the project: The next step is to "monitor the project", in other words to critically check and recheck the decisions taken, and the activities performed and adjusted when needed. On the one hand, project control refers to controlling the project performance based on deviations from the expected project progress. Again, the project schedule acts as a point of reference for project control. On the other hand, project control also encompasses corrective actions to ensure successful project outcomes.

Step 7: Abandon the project if necessary: In some cases, it is more beneficial to admit that the project has failed than to keep on wasting time and money. Therefore, if all previously mentioned efforts do not yield the desired effects, dare to abandon the project.

Step 8: Keep on communicating: Finally, communication is critical during the entire project recovery. For example, when established that the project objectives fit the business objectives (Step 1), the start of the recovery should be communicated clearly. This might seem obvious at first sight, but in many cases, people will start blaming one another or searching for things that went wrong, hereby wasting precious time. To avoid this, describe the situation and get back to the business of solving problems and conflicts. In this way, good communication may function as a tool to get people on board of the project recovery process. Additionally, when the project objectives, requirements, scope… are redefined (Step 2), they should be comprehensible for every stakeholder of the project. Moreover, when the project resources are reallocated, make sure that it is clear who is responsible and accountable, and who should be consulted and informed. Furthermore, once the recovery schedule is drafted (Step 3), this plan should be transparent and understandable for everyone involved in the project. Communication is also vital for risk analysis (Step 4). Risk is about emotions and includes subjective feelings so as a project manager, you should talk to your team to know what can go wrong and to understand the risk. In conclusion, not only at the start of the project recovery process but also later on the project recovery process, and even after the project recovery, communication is important. Every single person in the project team should stay committed and informed throughout the entire (recovery) project life cycle. Not a single relevant detail about the project can be withheld, even inferior performances need to be communicated.

4. CONCLUSION

Despite numerous project management studies, project failure is still a widespread and costly phenomenon in a wide range of sectors. For this article, we rely on the project management literature pertaining to success factors and failure causes, and project recovery frameworks to introduce a ready-to-use action plan to bring troubled projects back on track. Projects prove to be both great challenges and great opportunities. Our eight-step recovery plan can provide guidance to effectively recover from project failure and achieve project success.

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