

Success Factors in Project Management. Systematic Review of Ten Years of Research

Completed Research

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Abstract

Projects are essential to implement change in organizations. The success of organizational change therefore depends on the success of projects. However, sound evidence regarding project success is rare and empirical knowledge has not yet been systematically consolidated. This paper presents a literature review of success factors in project management and discusses their impact on project success. It is focused on studies which are based on empirical research to identify relevant factors and to gain sound evidence.

Keywords

Project Management, Success Factors, Systematic Review, Evidence

Introduction

Today, projects are a common means for the development of new application systems, processes etc. The success of organizational change therefore heavily depends on projects and their success and performance or, vice versa, failure impedes development and change. Nevertheless, many projects still fail and empirical studies show that project results to a considerable extent are not delivered on time, on budget and with the specified quality. Research literature in this domain, however, is mainly design oriented and dedicated to the development of new methodologies to improve project management practice. In contrast, empirical knowledge about the factors influencing project success is scarce and recent existing empirical knowledge has – to the best of our knowledge – not yet been consolidated this way.

By executing a literature review, we follow Niemi (1986, pg. 5), who points out that “single [...] studies in the social and behavioral science rarely provide definitive answers to research questions. Rather [...] it must be through the discovery of underlying trends and principles developed from the accumulation and refinement of a large body of studies.” Accordingly, he underlines the importance of reviews of empirical research with the goal to summarize and clarify the state of science in a field at a given point in time. To take a step in this direction, our paper structures empirical knowledge regarding success factors in project management and presents it in a Summary of Findings (SoF) table. It aims at answering the research question: *What factors have an impact on the success and failure of projects?*

In the next chapter we present the research methodology, followed by a description of the process and the results in order to ensure transparency. Thereafter, a discussion of findings and limitations is presented. In the final section, we conclude the paper and outline future research directions.

Research Methodology and Related Work

In other disciplines, so called “systematic reviews” have gained importance, for example in evidence-based medicine they are a tool to accumulate findings from individual studies to consolidate knowledge and to guide practical decision making (Higgins and Green 2011; Booth et al. 2012). Until recently, “information systems (IS) scholars tend to be unaware of the need for structure in literature reviews” (Okoli and

Schabram 2010; Webster and Watson 2002) but for some years now, the role of reviews and the rigorous application of methods has been discussed and the opinion has prevailed, that a good method is crucial for the comprehensiveness and the accuracy of a literature review (Boell and Cecez-Kecmanovic 2016; Goeken 2011; vom Brocke et al. 2009; see especially Journal of Inf. Tech. 30 (2)). To be rigor requires the application of an explicit, transparent and well-documented procedure to find, evaluate and synthesize the best available research studies related to a specific research question. Thus, the findings become transparent and reproducible, which increases the credibility of the review results (Oates 2011). Although different proposals exist regarding the procedure, there seems to be substantial agreement on the outline of the process (figure 1). Since the research question has already been explicated, we start with phase 2.



Figure 1. Process for a Systematic Review (based on Cooper 2016; Goeken 2011)

In addition to primary studies that examine success factors, there are few reviews of related aspects. These either tend to examine narrow questions (e.g. soft skills (Iriarte and Orè 2018), failure (Pankratz and Basten 2013), uncertainties (Marinho et al. 2014), special project types (Ghayyur et al. 2018; Savolainen et al. 2011)) or they are not transparent with regard to procedure and method as well as the detail or presentation of the results (e.g. Frefer et al. 2018, Spalek 2014, Alotaibi and Al Nufei 2014).

Systematic Review: Consolidation of Research Findings

Searching the literature (Phase 2): This includes determining parameters (sources, publication dates, keywords, etc.), followed by conducting a search applying these parameters. Levy and Ellis (2006) suggest focusing on high quality research findings by utilizing journal rankings. Given the often broad nature of such rankings and the narrow research stream in our case, we decided to cast a wider net by using portals. Further, we expected relevant studies beyond IS (e.g. organizational/management research).

Executing the literature research in portals and databases, it is sensible to narrow down the broad field of literature by decomposing the research question from phase 1 into keywords (Kitchenham et al. 2004). Best results in terms of quantity and precision are achieved, if synonyms and homonyms are considered and terms are combined with Boolean operators and there are more techniques to optimize recall, precision and coverage (Cooper 2016; vom Brocke et al. 2009). The search parameters used are presented in figure 2. As a preliminary report has been published in German, we used the German terms as well.

Three restrictions come into play, which must be regarded as limitations: (1) The period of publication was limited from 2009 to 2018, to keep the amount of literature manageable for this paper. (2) Due to language restrictions, eight studies were excluded from the sample (e.g. Polish and Italian). (3) We believe that a high degree of cultural heterogeneity hampers the integration of findings from primary studies. This is an effect that is increasingly being considered in primary studies with a cross-cultural and cross-national focus. E.g. Pennell et al. (2017) discuss the total survey error paradigm and specific error sources “that are unique to or may be more prominent in multinational, multiregional, and multicultural surveys”. Smith (2011) outlines three dimensions in which studies may differ, one of which is “from whom the data are collected” and remarks: “The greater the difference on any of the dimensions between two surveys, the more problematic is comparability.” It is assumed that in these cases bias is inevitable so that control of heterogeneity is essential. This circumstance, which most likely applies to reviews as well, has not yet been dealt with intensively in review research. To avoid this bias, we decided to reduce heterogeneity by excluding studies from Asia and Africa (we refer to this as “regional restriction”). In further research, studies from more regions should be included, because if there is control of heterogeneity, valuable insights can be drawn from a comparison - especially for success factors in international projects.

Sources	EBSCOhost Business Source Premium, Google Scholar, Science Direct und SpringerLink
Keywords	"Project Success & Empirical", "Project & Success & Empirical", "Project Failure & Empirical", "Project & Failure & Empirical", "Project & Failure & Empirical", "Project Failure & Empirical", "Project & Success & Empirical" and "Project & Failure & Empirical" as well as the respective German translations.

Figure 2. Search Parameters

Selecting the studies for inclusion (Phase 3): A total of 244 matches was found in phase 2. Next, we examined the titles. Accordingly, results were excluded due to redundancy (71), regional restriction

(32) and thematic incorrectness (67). 8 studies were excluded because of language restrictions. The abstracts were examined, what led to an exclusion of 31 studies. After reading and examining the studies, seven more were excluded. In the end, 28 studies were selected for inclusion in presentation and discussion (see figure 3 for selection process; the SoF table (table 1) for the studies included).

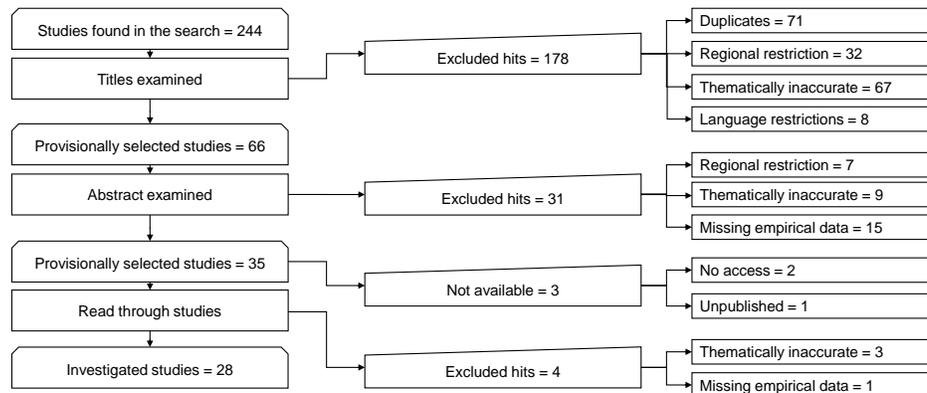


Figure 3. Literature selection process

Assessing the quality of included studies and structuring of results (Phase 4): In the fourth phase, information is extracted from the primary studies that can contribute to answering the research question (Goeken 2011, Cooper 2016). In addition, the quality of the studies is assessed depending on the data collected and the research methods applied in the primary studies.

The database on which the selected studies are grounded is widely diversified. The results are mostly collated by questionnaires to direct project participants like project managers, project teams and clients. In Montequin et al. (2014), Locatelli et al. (2014) and Stankovic et al. (2013), the gained evidence is valued on the lowest level due to the small sample size, number of questionnaires, etc. (lower two-digit range). Other studies out of the selected sample have a much larger sample size, e.g. Anand et al. (2009) and Patanakul et al. (2010); they are ranked as more representative. It is peculiar that Mir and Pinnington (2013) only used Yes/No-questions, whereas other studies used five- or seven-point Likert scales. Therefore, the informative value of the results of Mir and Pinnington (2013) is rated lower.

The mathematical-statistical evaluation in the individual studies is mainly carried out by using correlation, regression, variance and factor analyses. Significant deviations from this approach can be found in Alexandrova and Ivanova (2013), Locatelli et al. (2014), Montequin et al. (2014) and Taherdoost and Keshavarzsaleh (2016), which only provide correlations to a small extent and with limited methodology. The paper of Handzic et al. (2016) tests self-defined criteria in a model developed by its authors using an existing empirical database to confirm their own hypotheses. Because of utilizing this special procedure, the results are difficult to compare with other studies. In total, 16 of the 28 studies examined can be rated as good in terms of evidence and methodology. The investigations by Montequin et al. (2014) and Locatelli et al. (2014) have a smaller sample size and a less deep statistical approach compared to the other studies. The quality of the remaining ten studies lies between these extremes.

Combining the results (Phase 5): To outline results from review research different forms of representation exist. Literature suggests qualitative-tabular representations or quantitative-statistical consolidations (Cooper 2016, pg. 219). In our study, we choose a SoF table (table 1) to present essential aspects and relevant results of the selected studies. The *second* column characterizes the respective studies in terms of content and displays the topics of research. Since there are different definitions for project success the studies are differentiated according to the definition applied in the *third* column. The *fourth* column constitutes the methodology how empirical data was collected and what kind of evidence it is based on. The *fifth* column presents identified success factors which – according to the authors of the studies – have the greatest importance for project success.

Table 1. Summary of Findings (SoF) Table

Study	Topics examined and project type	Definitions of the outcome "project success"	Methodology and type of evidence	Identified success factors
Alexandrova/Ivanova 2013	- No specialisation on a topic - All types of projects	- "Magic Triangle" (cost, time, quality) - Customer satisfaction - Stakeholder satisfaction	- Questionnaire - Limited empirical, quantitative evidence	- Project manager & team member competence - Compliance with rules and procedures - Top management support - Quality of subcontractor services
Ahmed et al. 2016	- Top management support - All project types	- "Magic Triangle" (cost, time, quality) - Impact on customer, team, organisation - Business success	- Questionnaire - Literature review - Empirical, quantitative evidence	- Project manager leadership - Top management support
Anand et al. 2009	- Predicting success of process improvement projects - Six Sigma projects	- Yield improvement - Cycle-time/inventory reduction - Streamline supplier relationships - Customer satisfaction	- Questionnaire - Empirical, quantitative evidence	- Success depends on both explicit and tacit knowledge (significant correlation)
Arumugam et al. 2013	- Professional expertise - Learning behaviour of project team and manager - Six Sigma projects	- Creation of additional value to customer - Cost advantage	- Questionnaire - Literature review - empirical, quantitative evidence	- Experience & knowledge of project manager - Team climate
Badewi 2016	- Benefits & project management of IT projects	- "Magic Triangle" (cost, time, quality) - Return on investment	- Questionnaire - Empirical, quantitative evidence	- Benefits management - Project management
Bredillet/Dwivedi 2009	- Influence of working motivation to project management success	- "Magic Triangle" (cost, time, quality) - Customer satisfaction - Project quality - Success of implementation	- Questionnaire - Empirical, quantitative evidence	- Working climate & objectivity - Correlation between work motivation and project management success - Stakeholder communication
de Bakker et al. 2010	- Does risk management influence IT project success?	- "Magic Triangle" (cost, time, quality) - Customer satisfaction - Team performance - Risk management	- Journal articles from 1997 to 2009	- Risk sensitivity of stakeholders - Behavior of stakeholders during risk management process - Risk factors (technical & organizational)
Easton/Rosenzweig 2012	- Project manager experience - Project team experience - Team climate - Six Sigma projects	- Definition of better business processes	- Provided company data - Empirical, quantitative evidence	- Project manager experience - Use of statistical tools - Team climate
Fabricius/Büttgen 2015	- Risk expectation - Overconfidence of p. manager - All project types	- "Magic Triangle" (cost, time, quality)	- Questionnaire and field study - Empirical, quantitative evidence	- Realistic planning of cost and time - Project manager consideration of risk impact
Frey et al. 2009	- Success factor identification - Knowledge management to support project success	- "Magic Triangle" (cost, time, quality) - Customer satisfaction	- Interviews - Questionnaire	- Four success categories - Relation between project communication management and success - Functioning IT infrastructure & high process quality
Ghanshi/Aurum 2012	- Success from OSS in recruiting developer	- Developer interest - Project efficiency - Market needs - Management qualities	- OSS-Portal "sourceforge.net" - DEA & PLS	- Identification of market needs - Compilation of competences - Conditions of functionality - Project characteristics
Gollner/Bauman e-Vitolina 2016	- No specialisation - IT projects	- "Magic Triangle" (cost, time, quality)	- Questionnaire - Empirical, quantitative evidence	- Project & risk management - Clear definition of project objectives - Open communication
Gudienė et al. 2013	- No specialisation - Construction projects	- "Magic Triangle" (cost, time, quality)	- Questionnaire and field study - Empirical, quantitative evidence	- Project manager & team competence - Clear definition of project objectives
Guimaraes/Paranjape 2013	- Phase-related consideration of success factors - BPR projects	- Design of better business processes	- Questionnaire - Empirical, quantitative evidence	- Qualified project team - Leadership of the project manager - Team climate
Handzic et al. 2013	- Project customer - Qualified project team - Structure of project process - IT projects	- "Magic Triangle" (cost, time, quality)	- Literature review with partly empirical data - Limited empirical, quantitative evidence	- Qualified project team - Project manager competence - Customer relationship to project process - Structure of the project process
Ika et al. 2011	- Relation between critical success factors and project success - Success dimensions	- Monitoring - Coordination - Design - Training	- Questionnaire	- Insights from project management literature - Specific CSF set for World Bank projects (monitoring, coordination, design, training)
Ika et al. 2012	- No specialisation on a topic - World Bank projects	- "Magic Triangle" (cost, time, quality) - Customer satisfaction	- Questionnaire - Empirical, quantitative evidence	- Qualified and trained project team - Clear definition of project objectives - Project monitoring & risk management
Locatelli et al. 2014	- No specialisation on a topic - Energy megaprojects	- Cost - Time	- Literature review with partly empirical data - Limited empirical, quantitative evidence	- Stakeholder management - Project governance
Mir/Pinnington 2013	- No specialisation on a topic - All project types	- "Magic Triangle" (cost, time, quality) - Customer satisfaction - Business success	- Questionnaire - Empirical, quantitative evidence	- Project manager leadership - Management of key performance indicators - Qualified project team
Montequin et al. 2014	- No specialisation on a topic - All project types	- "Magic Triangle" (cost, time, quality)	- Questionnaire - Limited empirical, quantitative evidence	- Clear definition of project objectives - Specification of project's requirements - Realistic cost and time estimations - Stakeholder management
Papke-Shields/Boyer-Wright 2017	- No specialisation on a topic - All project types	- "Magic Triangle" (cost, time, quality) - Customer satisfaction - Business success	- Literature review with partly empirical data - Limited empirical, quantitative evidence	- Project management - Trade-off between cost, quality and time
Patanakul et al. 2010	- Project Management Tools and Techniques (PMTT) to support project success	- Three categories * Internal factors * Customer-related factors * Organizational-related factors	- Questionnaire - Empirical, quantitative evidence	- Contributors to success measures are contingent upon project phases - Instruments influence project success - Project manager sensitivity

Rosacker et al. 2010	- Application of critical success factors to hospital projects	- Reaching goals - "Magic Triangle" (cost, time, quality)	- Questionnaire - Empirical, quantitative evidence	- Monitoring - Feedback - Crisis management - Resource planning
Serra /Kunc 2014	- Benefits Realisation Management - IT projects	- "Magic Triangle" (cost, time, quality)	- Questionnaire - Empirical, quantitative evidence	- Benefits Realisation Management - Clear definition of project objectives - Keep monitoring of project outcome after closure - Realistic planning of cost and time
Serrador /Pinto 2015	- Agile methodology - All project types	- "Magic Triangle" (cost, time, quality) - Stakeholder satisfaction	- Questionnaire - Empirical, quantitative evidence	- Agile methodology (for IT and high-tech projects) - Clear definition of project objectives
Shokri-Ghasabeh /Kavousi-Chabok 2009	- Generic project success criteria and factors - All project types	- Definition differs - "Magic Triangle" (cost, time, quality) - Product success - User / stakeholder needs satisfaction	- Questionnaire - Literature review	- Success factors are not universal for all projects - Project control / scope / change / contracts - Project team - Top management support - Resource availability - Project risk management
Stankovic et al. 2013	- Agile methodology - IT projects	- "Magic Triangle" (cost, time, quality)	- Questionnaire - Empirical, quantitative evidence	- No identification of success factors
Taherdoost et al. 2016	- No specialisation on a topic - All project types	- "Magic Triangle" (cost, time, quality) - Sustainability	- Literature review with partly empirical data - Limited empirical, quantitative evidence	- Qualified project team - Leadership of the project manager - Clear project objectives
Xu et al. 2010	- Benefits from team-work quality and impact on project success	- "Magic Triangle" (cost, time, quality) - Customer satisfaction - Achievement of objectives - Monitoring of costs	- Questionnaire - Empirical, quantitative evidence	- Team-Commitment - Team-work quality - Actual / achieved effects are synonymous

Discussion (Phase 6)

Discussion of the Findings

While the definitions of *project success* vary in detail, a relatively high degree of agreement can be found regarding several measures. There is a tendency that authors no longer consider the “Magic Triangle” (cost, time, quality) as exhaustive to fully characterize success. Rather, other measures which sometimes are more difficult to operationalize are included (e.g. customer satisfaction and soft goals). Due to their broader conceptualization of project success, the studies by Arumugam et al. (2013), Easton and Rosenzweig (2012) and Guimaraes and Paranjape (2013) are considered separately during the discussion.

Even if disparities regarding the definition of project success are rather small in the studies, their varying focus (column 2) makes it difficult to compare and to juxtapose the factors (column 5) and to discuss them in an integrating manner. Since some factors are mentioned more frequently, there is more evidence for them. This could also be interpreted as having greater relevance in sense of stronger grounding. The highest degree of consensus can be seen in the following three factors: a qualified team, technical and management competence of project managers and clearly defined goals.

Regarding *team qualification*, the majority of the studies seem to assume that project managers at the beginning of a project know which qualifications, competencies and expertise of team members are needed for a successful project outcome. In contrast – according to Guimaraes and Paranjape (2013) – team qualification comprises not only technical appropriateness but is a dynamic concept including the development, adoption and enhancement of relevant competencies. The fact that team qualification and the necessity of its development and adoption were identified as a *success factor* could lead to the notion that well-grounded knowledge of a project manager is not self-evident. Therefore, it is recommended – especially in a dynamic environment – that project staff is trained regularly on changes happening, but also with regard to their general capabilities.

For project managers it seems to be a challenge to recruit and keep *appropriate staff*. Depending on organizational regulations and project organization they are responsible for the composition of the team but have to fall back on employees from other areas. As a result, a “purposeful bias” may arise (Mackie and Smith 1998) which means that a department delegates less qualified employees to the project and keeps high performers for their own daily work. This challenge could be linked to the identified factor of *leadership competence of the project manager* whose experience and skills were highlighted as crucial. Project managers should use their communication skills to convince the departments of the projects’ importance and the effects of occupying competent and professional staff.

In addition, studies show that *leadership competence* of the project manager has to address more issues, i.e. engagement of employees according to their qualifications, motivation of project participants and conflict resolution within the project team. Ideally, the project manager creates an atmosphere where

employees feel comfortable and are willing to achieve best performance. According to Arumugam et al. (2013) it is assumed, that motivated employees contribute a better and faster work performance: “Managers therefore must provide [...] an effective project leader to promote better social team interaction that will help to enhance performance.”

In contrast to the aforementioned ones, the frequently mentioned success factor *clearly defined goals* refers to the efficient use of existing resources. One consequence of missing or misinterpreted goal definition could be the inefficient use of resources which is not perceived or detected. In this respect, this can impede project management and the steering of resources. The importance of clearly defined and pursued goals which should not be changed during the whole project process is also acknowledged by Badewi (2015): “Delivering on time may mean that the scope of the project is clear and understandable to different stakeholders and therefore few changes in carrying out the project process are required or made.”

The deviating success criteria (column 3) in the studies of Arumugam et al. (2013), Easton and Rosenzweig (2012) and Guimaraes and Paranjape (2013) were mentioned above. As they are focused on a specific *project type*, namely process-related projects (BPR, Six Sigma), the main objective is to optimize or redesign existing processes and hence, only “improved process” or “customer’s benefit” are considered as appropriate success measures. Guimaraes and Paranjape (2013) examine the influencing factors in the different project phases and identify similar factors for these project types. Interestingly, soft factors appear to be of relevance, which is emphasized in these three studies. Especially here is, that *team climate* and *experience of the project manager* seem to be of particular importance. This might be caused by the fact that these projects are often executed in smaller teams with a restricted number of high qualified members, due to a relatively high level of complexity (Arumugam et al. 2013, p. 391).

However, the importance of similar *soft factors* is also underlined elsewhere. Bredillet and Dwivedula (2009) and Xu et al. (2010) support the argument, that a good team climate and functioning team organization have an important impact on project success. They find a strong correlation between work motivation of employees and project management success: „Important factors affecting project success include properly defined roles and responsibilities of an IT project team, teamwork and motivation.“ (Xu et al. 2010, p. 125). Along this line, Arumugam et al. (2013) discuss that project managers should ensure a positive team climate in order to achieve both, a better knowledge transfer among team members and a better organizational understanding: “Managers, therefore need to ensure better team climate [...] to project teams that help knowledge sharing and create organizational knowledge”.

In several studies – e.g. Bredillet and Dwivedula (2009), Frey et al. (2009), Gollner and Baumane-Vitolina (2016) – *project communication* plays an important role for achieving project success. It is not only necessary to have good internal communication among the project participants. Also, the external communication with various stakeholders can have a significant impact on the final success. Frey et al. (2009) discover a strong relation between the general project communication management and project success.

Another interesting aspect is revealed in the studies of Patanakul et al. (2010), de Bakker et al. (2010) and Fabricius and Büttgen (2015) who address *risk management* issues. Fabricius and Büttgen (2015) recognize that project managers often only pay attention to the probability of risks but not to possible impacts of failure. This suggests, that project managers have a special kind of risk perception which differs from the view of other project participants. Their goal is to limit the probability of occurring risks although – from a scientific point of view – the risk assessment should include both aspects. Fabricius and Büttgen (2015) find that “[...] risk assessment is influenced by project managers’ overconfidence through the mediator of risk awareness.” (p. 241). The findings of de Bakker et al. (2010) point in a similar direction. They examine the influence of risk management on IT project success and argue that not only project managers, but also all stakeholders should be sensitive to potential risks during the management process, hence, that risk awareness of all stakeholders should be improved.

Patanakul et al. (2010) discuss an important fact which is not discussed in detail in the remaining studies; it is the utilization of instruments and techniques to support project success. They analyze different *Project Management Tools and Techniques (PMTT)* and examine which of these are used in which phase of a project life cycle. Effectively they found that PMTT contribution to success is contingent upon project phases and influence on project success could be either positive or negative. “The results indicate that there are statistically significant correlations between the use of PMTT and different project success

measures in different phases of the project life cycle.” (Patanakul et al. 2010, p.52). Similarly, Serrador and Pinto (2015) find that an agile methodology for IT and high-tech projects leads to higher project success what specifies using several instruments in a broader sense. Besides the observations of Patanakul et al. (2010) and Serrador and Pinto (2015) there are other studies arguing that applying conventional methods has an impact on project success, i.a. “realistic planning”, “resource planning” or “monitoring of costs”. Montequin et al. (2014) explore “estimations” whereas Easton and Rosenzweig (2012) and Rosacker et al. (2010) introduce the utilization of “statistical tools”. Because of a broad diversification of instrument types, they are not discussed in depth in our study.

Another major challenge is the appropriate consideration of *less mentioned factors* like “project management” or “Top-management support”. Although these factors were identified as relevant for project success (e.g. Shokri-Ghasabeh and Kavousi-Chabok, 2009), there is no high level of consensus. In addition, especially “project management” is a too extensive concept which has to be analyzed in depth. It is named in several studies without concretion of its meaning what impedes an adequate handling in this study. It is also necessary to examine the relationship to related concepts such as “project governance” (Locatelli et al. 2014) and “project monitoring” (Ika et al. 2012).

Limitations

Obviously, our study has certain limitations. The searching criteria could only identify success factors but not failure factors. Although two studies – Montequin et al. (2014) and Taherdoost and Keshavarzsaleh (2016) – also deal with failure factors, these results were not considered in this paper. A “publication bias” must be assumed because of the fact, that positive findings are more likely to be published than negative ones. In our case, this is apparent from the fact that authors prefer a presentation of project success and not of project failure. This limitation could also be a hint for the assumption that authors do not try to publish studies with less or non-significant results – a phenomenon called “file drawer problem”. Another limitation emerges from the inconsistent usage of terms and concepts. This impedes the evaluation and consolidation of research findings from different studies. A thorough and detailed analysis of the identified terms and success factors regarding their semantic could extend the findings of our study.

The focus on specific topics in single studies makes it difficult to generalize, to find statements that support each other and to gain general evidence. Thus, it is rather difficult to deduce validated factors. Yet, our analysis identifies tendencies that could guide further future research, possibly even theory-building.

Because of focusing on a ten-year horizon of research, only a limited sample size is evaluated. One reason for this limitation is to allow for a feasible handling of the literature in a conference paper. In addition to a simple extension of the period, a comparison of periods could provide interesting results, e.g. to compare the ten years 2009 to 2018 with another ten-year period to reveal a possible shift of topics and factors and, in doing so, identifying tendencies in the development of project management.

To avoid bias arising from international and cultural heterogeneity, a regional restriction was introduced. The exclusion of studies from Asia and Africa was our approach to better control for heterogeneity. However, this can only be a first step. In order to deal with cultural differences as a moderating variable adequately, further studies should analyze this topic more profoundly.

The analysis of several studies shows that there is a broad variation in database and data quality. For example, some of the studies are grounded on already existing data; others refer to self-developed models and questionnaires. Furthermore, the levels of significance for the single correlations are not reported in all studies what leads to a missing meaningful and extensive comparison of the magnitude of effects. According to this, it was not our attempt to analyze and integrate the empirical results with statistical methods in a meta-analysis. Further research should approach this by dealing more systematically with the effect measures observed in the primary studies.

Conclusions and Future Work

Our goal was to identify and consolidate results from existing empirical research about success and failure factors in project management. Another goal was to further demonstrate the applicability and usefulness of review research in this domain. To achieve this, we developed – based on a transparent process model – a so called Summary of Findings table which provides insights for answering the research question. The

most important contribution is this compilation of research results that depicts and juxtaposes success factors.

As one can expect from meta-research, our work does not reveal completely new, unexpected or surprising findings, but shows important tendencies and facts regarding project success factors. Although there is no consensus on the whole, we were able to identify success factors that have a relatively strong grounding (qualified team, technical and management competence of project managers, clearly defined goals). However, the fact that there is more evidence for them does not mean that they are indeed more significant. Further research is therefore needed to examine the less well-founded success factors.

There are some challenges regarding the applicability of reviews. One is the page constraint of a conference paper. Another is the limited summarizability of studies from different countries and cultures. To deal with this, we have introduced restrictions that improve feasibility but limit representativeness. This also provides starting points for further research.

In addition, based on the results and possible extensions, research could aim at deriving "design guidelines" and thus – in addition to gaining insights – to also support the methods of project management in their application in practice, what can be considered "evidence-based practice". Besides, there are approaches to build theories based on reviews, which can also provide interesting perspectives for further research.

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