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## DESIGNING A PROJECT EVALUATION FRAMEWORK

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## **Designing a Project Evaluation Framework**

### **Abstract**

The purpose of this paper is to advance project evaluation and assist scholars and practitioners evaluating projects. The paper asks and answers the research question: How can evaluators design viable evaluation frameworks for projects? Based on literature on projects and evaluation, the paper utilizes an action design research methodology to unfold a project evaluation framework. The paper contributes to theory and practice in three ways. First, it presents a multidimensional project evaluation framework at an abstract level. Second, it outlines how this framework is applied in a concrete evaluation study of a new project methodology. Third, it takes the first step towards a set of design principles that can mature into a complete design theory for viable project evaluations. Finally, the paper contributes methodologically in illustrating the usefulness of action design research, which is a solid methodology that has not previously been applied within project studies.

### **1. Introduction**

Project evaluation is necessary – to learn, improve, lead and manage projects (Chen, 2015; Dahler-Larsen, 2013; Mertens & Wilson, 2012; Samset, 2003; Stufflebeam & Coryn, 2014). To enhance project evaluation, a growing body of literature on the topic has emerged. Most of that literature evolves around success and how to determine levels of success, i.e. by what criteria. One of the earliest success criteria models is the classical Iron Triangle – assessing time, cost and quality (Lenfle, 2012) on a rather short-term scale. These success criteria are widely used today – but also long-term perspectives on impact and benefit are taken into account (Atkinson, 1999). Within the last decades, the literature has moved towards a broader view of project evaluation (Zidane & Olsson, 2017) and conceptions of success – from

considering primarily the production of the project to encompassing more of a project's life cycle (Judgev & Müller, 2005).

While such contributions clearly advance project evaluation, they are limited in terms of their black and white approach – aimed at judging whether a project is successful or not.

The problem with the success/failure dichotomy is that it tends to rely on summative evaluations (Scriven 1991 in Chen, 2015, pp. 7-10). Summative evaluation takes a retrospective look back on a project – and judges its results after the project has been completed. Thus, a summative project evaluation is done in hindsight at a point in time, when it is too late to improve the project. Ideally, project evaluation creates value – and to do that, the conception of project evaluation needs to move from a limited retrospective result approach to encompassing project development and focusing on future value and (organizational) change potential (Christensen & Kreiner, 1991). Project evaluations need to be implemented and applied to create change and improve projects (Dahler-Larsen, 2013, p. 52) before they end or even start.

Another problem with the success/failure dichotomy is that the focus on success criteria leaves aside considerations of relative project evaluation – i.e. project comparison. Often the evaluator infers a singular view on one project, and in many project evaluations, a project is only compared to itself – in an earlier or later version, at a different point in time. Such singular and absolute project evaluations reveal nothing about a project's relative performance, i.e. whether it performs better or worse than other projects. It may be that a failed project performs better, or that a successful project performs worse, than other projects. Conclusions based on singular project evaluations risk being inadequate or inaccurate – and decisions based on such evaluations may be wrong and harmful to one or several projects, and in the end to the organization as a whole.

In order to address these shortcomings we advocate multidimensional project evaluations.

The aim of this paper is to further advance project evaluation by nuancing its conception and assisting researchers and practitioners in designing viable project evaluations that create valuable project knowledge, and take into account project development and consequences as well as absolute and relative project considerations.

The paper is guided by the following research question: *How can evaluators design viable evaluation frameworks for projects?*

To solve this problem we apply an action design research methodology (Sein, Henfridsson, Purao, Rossi, & Lindgren, 2011) and abstract our concrete project evaluation problem by considering it representative of a more general class of problems – namely: how to design project evaluation frameworks.

Following the action design research methodology, we extract knowledge beyond our specific problem and contribute to theory on project evaluation in three ways (Gregor & Hevner, 2013; Pries-Heje & Baskerville, 2008). First we develop a project evaluation framework exemplified as an artifact and contribute with knowledge as architecture (Gregor & Hevner, 2013, p. 342). Second, we illustrate an application of the project evaluation framework exemplified as an instantiation and contribute with a situated implementation of our artifact (ibid.). Third, we take a step towards developing a set of design principles for project evaluations that can eventually mature into a complete design theory for project evaluation (ibid.). Based on these contributions, the paper aims to assist project practitioners and researchers design viable project evaluations.

The paper is structured as follows. After the current introduction, a theoretical section follows outlining and synthesizing extant knowledge on projects and evaluation as well as project

evaluation. Third, the methodological considerations behind the paper are described. The fourth section presents the project evaluation framework. The fifth section illustrates how the framework can be applied in a concrete project evaluation study. The sixth section introduces a set of principles for designing project evaluation frameworks. Finally, the contributions and limitations of the paper are discussed, before the paper is concluded.

## **2. Theoretical Background**

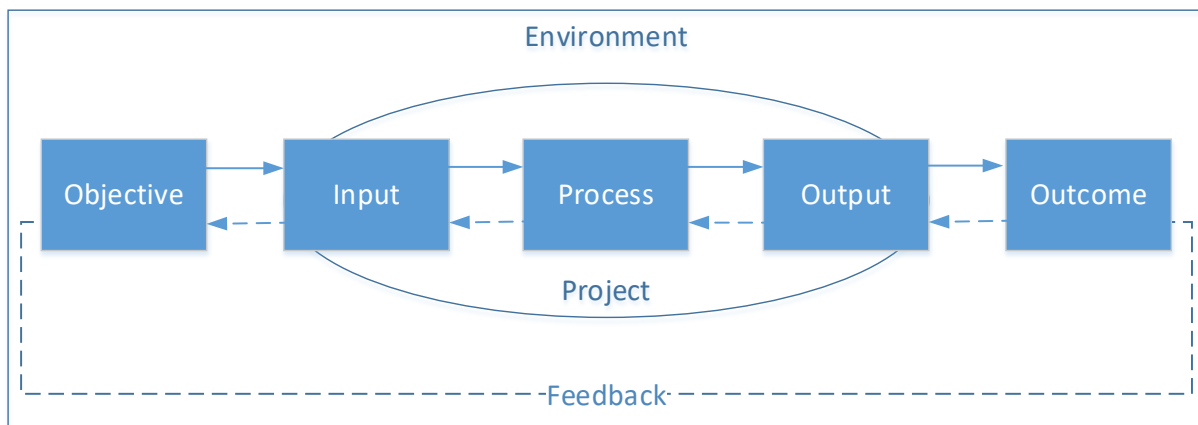
### **2.1 Project**

A paramount requisite in evaluation theory is to define the evaluand, i.e. the subject or focus “thing” of the evaluation (Dahler-Larsen, 2013; Mertens & Wilson, 2012). In this case, it is a project.

According to Andersen (2008, p. 10): “[A] project is a temporary organization, established by its base organization to carry out an assignment on its behalf”.

Another prevalent way of conceptualizing projects is the system view. Figure 1 illustrates a project and its interdependent elements in a system view (Adapted from Andersen, 2010; Chen, 2015; Dahler-Larsen, 2013; Laursen & Svejvig, 2016). Figure 1 shows what is referred to as a “logic model” (Zidane, Hussein, Johansen, & Andersen, 2016): a simple representation of a project as an open system – relating to and depending on its environment (Bertalanffy, 1956). Objectives are expressed goals: the primary idea and intention of the project (raison d’être) that inform concrete success criteria. Inputs are resources (money, technology and personnel) that are transformed to outputs through project processes or mechanisms (practices). Outcome is the resulting impact derived from the project’s output (deliverables). The project is embedded in an environment (organization and society) that enables and constrains the project through social

norms and formal structures. Feedback mechanisms are shown with dashed lines and indicate responses from all the elements (Bertalanffy, 1968; Chen, 2015).



**Figure 1: A project – as a logic model in an open system view**

The process perspective and the open system view set conditions for the evaluation of projects. A project can be evaluated on all elements shown in Figure 1, but as projects are constantly changing processes, the evaluation will only and always rely on one or more pictures of the project at a specific point in time.

## 2.2 Evaluation

In general, evaluation can be conceived of as a natural part of everyday life. Evaluation is *the action of appraising or valuing (Oxford English Dictionary)* something and an integral part of our basic human cognitive processes.

Although there are documented evaluations of human interventions dating back to 2200 B.C. (Shadish, Cook, & Leviton, 1991, p. 21), the issue of project evaluation became especially important in the USA in the 1960s (Chen, 2015), when the administrations of Kennedy and Johnson invested heavily in social programs (Linzone & Schiuma, 2015). Today, some talk about the evaluation society (Dahler-Larsen, 2013) and consider evaluation a profession around which there is a community of evaluators (Stufflebeam & Coryn, 2014). The evaluand within

this community is denoted programs – but is essentially the same as projects (Dahler-Larsen, 2013; Williams, 1971). Although we are aware of the difference between a project and a program in the project management domain, in this article we use the same word (project) for both terms (program and project) to limit confusion.

The project management literature is scant when it comes to distinct definitions of project evaluation. But definitions of evaluation in general are rife (Dahler-Larsen, 2013, p. 48). In a collection of 10 evaluation definitions, evaluation is conceived as a process of systematic assessment, examination, investigation and determination (Dahler-Larsen, 2013, pp. 48-49). Based on these definitions, Dahler-Larsen describes how the understanding of evaluation has developed over time – from a method-centered approach in the early 1980s to an approach in which the project’s context and conditions are more central and the method is clarified through dialog.

Within the evaluation domain, there is a large number of evaluation classifications – including evaluation paradigms, approaches, branches, typologies, types and models (Chen, 2015; Linzalone & Schiuma, 2015; Mertens & Wilson, 2012). Recent research has identified 20 evaluation typologies and more than 50 evaluation models (Linzalone & Schiuma, 2015). The many alternatives can seem overwhelming. Finding or designing an appropriate project evaluation framework can be conceived of as a matter of choice, or “fit” as some call it, between different elements like the evaluation intent, the basic values, key stakeholders and available resources (Linzalone & Schiuma, 2015, p. 92). As Dahler-Larsen notes: one model is only one optic (2013, p. 83) and behind every project evaluation there is a long list of decisions. Some decisions are recognized and expressed explicitly – others reside in the implicit. The more explicit they are, the higher the transparency and trustworthiness in project evaluation.

## 2.3 Project Evaluation

Reviewing extant literature on project evaluation, we find that the two domains (project and evaluation) have evolved in parallel and progressed disconnected from each other – with little interdisciplinary integration or communication across borders (see Dahler-Larsen, 2013, for an exception).

In order to answer our research question, Table 1 summarizes extant literature on project evaluation within four themes: process, outcome, benchmarking and learning. The table provides descriptions and examples of relevant conceptions and refers to empirical illustrations – to arrive at a picture of the current situation: the state of the art within project evaluation.

<b>Theme</b>	<b>Description</b>	<b>Example</b>	<b>Empirical illustration</b>
Process	Process evaluation focuses on one or more processes of a project (Chen, 2015) – to assess project management success, i.e. project (management) efficiency (Crawford & Bryce, 2003): doing things right (Zidane & Olsson, 2017)	The Iron Triangle focuses on the delta between expected and realized cost, time and quality within the project life cycle (Atkinson, 1999)	Investigation of the constitutive power of project narratives – to determine project success and failure (Fincham, 2002)
Outcome	Outcome evaluation focuses on one or more outcomes of a project (Chen, 2015) – to assess project success, i.e. project effectiveness (Crawford & Bryce, 2003): doing the right thing (Zidane & Olsson, 2017)	The Square Route focuses on effects beyond the project life cycle like sustainability as well as direct (organizational) and indirect (societal) benefits (Atkinson, 1999)	In-depth, longitudinal case study of the evaluation criteria that different project stakeholders draw on – to assess project outcome (McLeod, Doolin, & MacDonell, 2012)
Benchmarking	Benchmarking compares one or more projects with a larger pool of projects – to assess which or why one or more projects perform better or worse than other projects (Barber, 2004)	Internal benchmarking compares projects within the same host organization and enables a prioritization of limited resources (R. G. Cooper, Edgett, & Kleinschmidt, 2000; Engwall & Jerbrant, 2003) and projects (Baker & Pound, 1964)	External benchmarking across different organizations of performance outcomes for different project phases – to establish industry norms and improve projects (Yun, Choi, de Oliveira, & Mulva, 2016)
Learning	Learning considers the experiences and knowledge produced (Duffield & Whitty, 2015) as well as the “know-how” and “know-why” (Schindler & Eppler, 2003) generated in and from a project – to develop and improve the same or other projects (Dahler-Larsen, 2013)	Debriefing methods facilitate the application of lessons learned, which are key project experiences representing a consensus on a key insight of general business relevance that should be considered in future projects (Schindler & Eppler, 2003)	Application of the Systemic Lessons Learned Knowledge model for Organizational Learning through Projects – to enable managerial conceptualization of how organizational know-how for projects is wired (distributed) across various elements of an organization (Duffield & Whitty, 2016)

**Table 1: Insights for project evaluation design from literature**



One of the earliest evaluation models within project management is the Iron Triangle (Atkinson, 1999). Today, it is referred to as a process perspective in the sense that it gives a picture of how a project is managed – of the manager’s ability to complete a project on time, within budget and according to the specified terms (Zidane et al., 2016; Zidane, Johansen, & Ekambaram, 2015; Zidane & Olsson, 2017). But the process approach is much more than the three cornerstones of the classical Iron Triangle. Referring to Figure 1, a process evaluation can include all transformative elements between project input and output as well as the situational elements conditioning these.

As a supplement to process evaluation, Atkinson (1999) proposes a Square Route to evaluation where the Iron Triangle is integrated into one corner of a quadrant focusing on more long-term outcomes beyond the project life cycle. In addition to the Iron Triangle, Atkinson suggests considering the strengths of the project’s result as well as the direct (organizational) and indirect (societal) benefits. Thus, the approach focuses more on the end result of the project and less on the means and ways towards it (Zidane et al., 2016; Zidane et al., 2015; Zidane & Olsson, 2017). But project impact can also materialize along the way. Value does not necessarily come late in or after the project life cycle. New project management methodologies, such as front-end loading and agile approaches, advocate fast results (Beck et al., 2001; Heeager, Svejvig, & Schlichter, 2016; Rigby, Sutherland, & Takeuchi, 2016).

Besides the success-driven focus on evaluation criteria like process and outcome, benchmarking is emerging as a theme within project evaluation. When questions arise concerning a project’s relative performance, comparison with other projects is necessary – here referred to as benchmarking. The conception of benchmarking has developed over time – from the first generation comparing products in the early nineties through competitive, process and strategic benchmarking to a fifth generation of global benchmarking that can help global project

organizations understand business process improvements and learn from the best in class (Barber, 2004, pp. 303-304). Today, internal and external benchmarking is a commonly used distinction. While there seems to be theoretical agreement that the terms “internal” and external” refer to the boundary of the host organization (Barber, 2004; Dahler-Larsen, 2013), that distinction can be difficult to operationalize in a project reality where projects are often co-created on the borders of numerous organizations spanning several industries and different sectors.

Another emergent theme in project evaluation is learning. Learning in itself is not new – but considering it as an integral part of project evaluation is not always done. *“In practice, organizational learning from projects rarely happens, and when it does it fails to deliver the intended results”* (Duffield & Whitty, 2016, p. 311). Research shows a great discrepancy between the need to apply project learnings and their actual deployment (Schindler & Eppler, 2003) and a tendency to look back at projects and judge their success retrospectively (Rogers & Williams, 2006) without paying considerable attention to the valuable lessons learned – especially in failed projects. *“The risk of a knowledge loss at a project’s end is a serious problem for organizations”* (Schindler & Eppler, 2003). In the few cases where this challenge is acknowledged and learning is actually considered, it is typically restricted to single-loop learning (Argyris 1996 in Rogers & Williams, 2006) or patterning: learning by generalization (Vygotsky 1978 in Rogers & Williams, 2006). Such learning types often confirm what is already known. They can identify and correct errors, but they stay within the existing set of stated goals and assumptions (Rogers & Williams, 2006, p. 78). The lack of puzzling and double-loop learning in projects and project evaluation is in itself puzzling – as learning is of vital importance to the host organization.

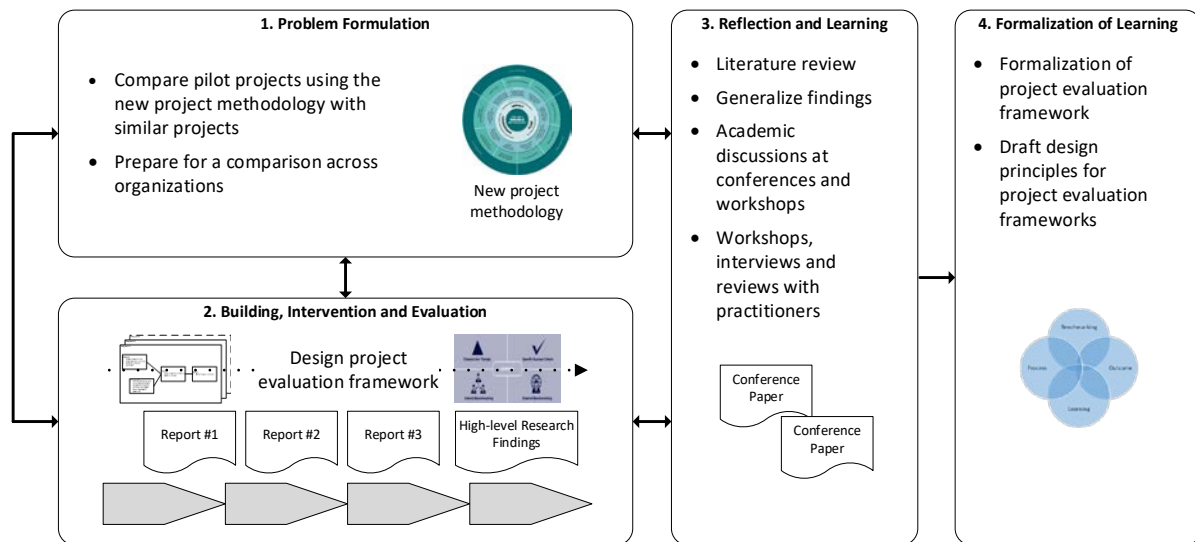
### **3. Research Methodology**

### **3.1 Using action design research to build a project evaluation framework**

The paper follows Sein et al.'s definition of action design research (ADR): "*ADR is a research method for generating prescriptive design knowledge through building and evaluating... artifacts in an organizational setting*" (Sein et al., 2011, p. 40). The ADR study has elements of action research (interventions) and design research (artifacts) (Goldkuhl, 2012). The ADR study is particularly relevant for building and evaluating a project evaluation framework (artifact) as it uses a systematic specification of design knowledge (Gregor & Jones, 2007, p. 314) based on insights from the practice as well as theoretical justification from prior evaluation and project evaluation theory.

The ADR study implies close collaboration between researchers and practitioners to build and evaluate an artifact. "*This method relies on an iterative design search process for designing an effective artifact, complemented by additional stages of reflection and the formalization of learning. It thus follows inductive processes of reflection and abstraction*" (Giessmann & Legner, 2016, p.: 558), as outlined by Gregor and Hevner (2013). Design theorizing takes place both in an abstract domain and an instance domain (Lee, Pries-Heje, & Baskerville, 2011) where the project evaluation framework is at the abstract level while a specific evaluation using the project evaluation framework is an instance.

The ADR method consists of four interleaved stages: (1) problem formulation; (2) building, intervention and evaluation; (3) reflection and learning; and (4) formalization of learning. Figure 2 shows how these four stages evolve in an ADR study aiming at evaluating a new project methodology and serving as the foundation of this paper.



**Figure 2: Action design research process**

This ADR study illustrated in Figure 2 is a Danish initiative undertaken in collaboration with the Danish Industry Foundation and the Danish industry, involving 16 organizations including one pilot project and three reference projects in each organization, as well as a consultancy firm and two universities. It entails designing and applying a project evaluation framework on approximately 68 projects to evaluate a new project methodology for the Danish industry.

The process outlined in Figure 2 is an iterative process moving back and forth between the stages as stipulated in the ADR method (Sein et al., 2011). The ADR study started in the summer of 2015, but the story behind the initiative starts earlier, as presented in the next section.

### **3.2 Action design research context**

The Danish initiative started in 2013 as an informal network in Danish industry discussing how to develop project management in the light of the apparent high project failure rate - e.g the Chaos Reports by the Standish Group (2015; Hastie & Wojewoda, 2015). The initiative matured and gradually began to formalize. From spring 2015 it was funded by the Danish Industry Foundation and established as a formal Danish initiative. It kicked into action in June 2015. The intention was to implement and evaluate a new project methodology in 16 real projects

(Svejvig & Grex, 2016). In spring 2016, the initial ideas about the new project methodology were operationalized into the *Half Double Methodology*, focusing on impact, flow and leadership (see Appendix A).

This ADR study follows an organization-dominant “building, intervention and evaluation” (BIE) schema to generate design knowledge through organizational intervention (Sein et al., 2011, p.: 42). The new project methodology was developed by consultants, but with discussions with, and inputs from, the organizations and researchers involved. The organizations apply the new project methodology in pilot projects and the research team evaluates the results using different evaluation methods. The learnings from the evaluation of the new project methodology go beyond the specific situation as we have formalized the learnings into the proposed project evaluation framework, which can be applied to a broader class of project evaluations.

### 3.3 Action design research process

Table 2 gives an overview of the activities of the Danish initiative, which extend over a period of four years.

Organizations and consultants	Research team	Artifact
<i>Stage 1: Problem formulation (June 2015 to August 2015)</i>		
Preparing to enter pilot organizations and implement the new project methodology in pilot projects	Searching literature on evaluation theory and application and drafting research design for how to evaluate pilot organizations and projects using the new project methodology	Goals of evaluation: a) To compare each pilot project with three reference projects within the same organization b) To compare pilot projects across organizations
<i>Stage 2: Building, intervention and evaluation cycles (August 2015 to June 2019)</i>		
The new project methodology is implemented in seven pilot organizations	Preparing the first evaluation	<b>Project Evaluation Framework version 1</b> including a description of the evaluation process, a figure of the overall evaluation design and a template for project evaluation (Appendix B)
Consultants, organizations and researchers evaluate and re-evaluate the pilot projects		First evaluation report published (Svejvig et al., 2016)

<b>Organizations and consultants</b>	<b>Research team</b>	<b>Artifact</b>
The new project methodology is implemented in nine additional pilot organizations	Preparing for comparison across pilot organizations	Second evaluation report published (Svejvig, Rode, & Frederiksen, 2017)
Consultants, organizations and researchers evaluate and re-evaluate new pilot projects in and across organizations		Third evaluation report published (Svejvig, Adland, et al., 2017)
Practitioner conferences are held to disseminate the results	Extracting key learnings into high-level research findings	High-level research findings published (Rode & Svejvig, 2018)
Consultants, organizations and researchers evaluate and re-evaluate new pilot projects in and across organizations		Fourth evaluation report published (forthcoming)
<i>Stage 3: Reflection and learning (June 2015 to December 2018)</i>		
	Theorizing and generalizing the project evaluation framework	<b>Project Evaluation Framework version 2</b> (Appendix B) presented at an academic management conference (Laursen, Svejvig, & Rode, 2017)
<i>Stage 4: Formalization of learning (January 2018 to January 2019)</i>		
	Formalizing learnings by refining the project evaluation framework and drafting abstract design principles	<b>Project Evaluation Framework version 3</b> (Appendix B)

**Table 2: Action Design Research Stages**

**Problem formulation:** The overall objective of our research was determined from the agreement with the funding agency to design and implement an approach for evaluating the use of the new project methodology. However, there was no easy road from the overall objective, and we were struggling to find evaluation methods that were suitable for our purpose. A comprehensive literature search on evaluation theory and applications (e.g. Stufflebeam & Shinkfield, 2007) was carried out. It became clear during that process that we had to operate with different kinds of (intra-organizational and inter-organizational) comparisons (inspired by Rihoux & Ragin, 2009) and to design a template to map projects with context, mechanisms and outcome (Pawson & Tilley, 1997) based on a system view on projects e.g. Figure 1. Against this backdrop, we designed our first research draft for how to evaluate the pilot projects and organizations using the new project methodology. Furthermore, the following goals for the evaluation process were defined: (a) to compare the pilot projects using the new project

methodology with three similar reference projects within the same organization; and (b) to prepare for a comparison of the pilot projects across the pilot organizations using the new project methodology.

**Building, intervention and evaluation:** The first period of the initiative was experimental when we entered the first two organizations where both the new project methodology and the evaluation approach were in flux. In this period, we developed and applied a Project Evaluation Framework version 1 (Appendix B) to map the projects using the diamond model (Shenhar & Dvir, 2007) to classify projects, including their novelty, pace, technology and complexity (Fangel, 2010). Key performance indicators were also identified to map pilot and reference projects in the same organization inspired by reference class forecasting (Flyvbjerg, 2006). All data were written up in a confidential report.

The first period (project #1 to #7) resulted in publication of the first evaluation report (Svejvig et al., 2016) outlining the preliminary results and including many quantitative and qualitative evaluation data – such as success criteria and lessons learned.

The second period (project #8 to #16) is characterized by a more standardized process with clear scripts and templates for the evaluation process. During that period, three evaluation reports are published (Svejvig, Adland, et al., 2017; Svejvig, Rode, et al., 2017, forthcoming). Moreover, a booklet on high-level research findings was published (Rode & Svejvig, 2018) and presented to practitioners at conferences and meetings.

**Reflection and learning:** The Project Evaluation Framework version 2 (Appendix B) was developed through a theorization and generalization of the first version. The theorizing took place in two domains: the abstract domain and the instance domain (Lee et al., 2011). We started with a problem about how to evaluate projects using the new project methodology and compare them with similar reference projects not using the new project methodology. We developed an abstract solution based on open systems theory

(Andersen, 2010; Chen, 2015), evaluation theory (Pawson & Tilley, 1997; Stufflebeam & Shinkfield, 2007) and the diamond model for project characteristics (Shenhar & Dvir, 2007) including project complexity (Fangel, 2010). The abstract solution was then instantiated in the pilot organizations using the new project methodology. The projects were carried out at different times, so we were able to learn from organization to organization and improve the evaluation design along the way. Refined versions of the abstract solution were presented at conferences (Laursen et al., 2017; A. L. G. Rode & P. Svejvig, 2018; Svejvig & Hedegaard, 2016) and feedback was integrated to further refine the framework.

**Formalization of learning:** The generalized abstract solution presented in this paper is the mature and final Project Evaluation Framework version 3 (Appendix B). The artifact is presented in the following Section 4 and the instantiation of it is shown in Section 5. These two sections are used to draft more abstract design principles for creating project evaluations presented in Section 6. These *“design principles capture the knowledge gained about the process of building solutions for a given domain, and encompass knowledge about creating other instances that belong to this class”* (Sein et al., 2011, p.: 45). The derivation of these design principles follows an inductive process in the sense that they connect generalized outcomes to a given class of solutions (Sein et al., 2011), namely how to design viable project evaluations.

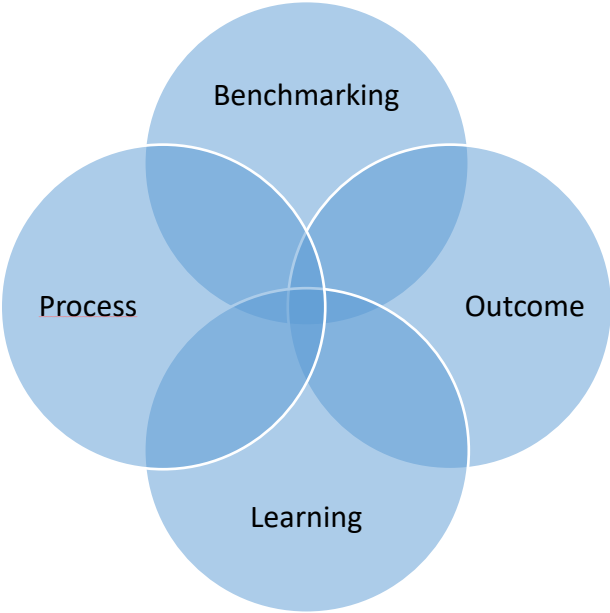
#### **4. Artifact: a Project Evaluation Framework**

As outlined in the introduction and theoretical review, the evaluation debate within research on projects and project management has for a long time primarily revolved around success criteria. The discussion has developed from a short-term focus on the classical Iron Triangle to also taking into consideration more long-term outcomes as the Square Route suggests (Atkinson, 1999), or even applying a hybrid of both (Chen, 2015; Dahler-Larsen, 2013) and considering the generated value (input/outcome) of projects (Laursen & Svejvig, 2016). The framework we propose extends advancements within the evaluation debate and incorporates the process and



outcome approaches into a diagram – showing them as separate elements that are bound together and form a multiperspective evaluation picture of the project. The diagram also encapsulates benchmarking: a comparable dimension enabling a relative evaluation (Barber, 2004). Finally, learning is also integrated – to emphasize the need to look beyond traditional approaches and take into consideration new and alternative perspectives that may challenge old worldviews and taken-for-granted assumptions governing what we do and think about project evaluation (Rogers & Williams, 2006).

The artifact is illustrated in Figure 3: Project evaluation framework.



**Figure 3: Project evaluation framework**

Contrary to earlier research connecting a process approach with a short-term perspective and an outcome approach with a long-term perspective, none of the four approaches of our project evaluation framework is time dependent or restricted to a certain time period: A project can be evaluated in the short, medium or long term within the specific focus area of all four approaches.

Table 3 outlines examples of project evaluation questions and studies of each evaluation approach.

Approach	Questions	Examples
Process	<ul style="list-style-type: none"> <li>• How efficient is the project management?</li> <li>• What characterizes project management practice?</li> <li>• Why does an intervention (not) work?</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating project management success in terms of time, cost and quality</li> </ul>
Outcome	<ul style="list-style-type: none"> <li>• How effective is the project?</li> <li>• What characterizes project performance indicators?</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating project success in terms of organizational and societal outcome</li> </ul>
Benchmarking	<ul style="list-style-type: none"> <li>• Which projects are superior?</li> <li>• What are best practices?</li> <li>• Which projects can apply best practices?</li> <li>• What is common among failed projects?</li> <li>• When and where does an intervention work?</li> </ul>	<ul style="list-style-type: none"> <li>• Internal benchmarking – comparing projects within the same organization, branch, portfolio or program</li> <li>• External benchmarking – comparing projects across organizations, trades, industries or sectors</li> </ul>
Learning	<ul style="list-style-type: none"> <li>• What happens if we challenge our assumptions?</li> <li>• How can we elicit proof of the contrary conclusion?</li> </ul>	<ul style="list-style-type: none"> <li>• From single-loop learning to double-loop learning</li> <li>• From patterning to puzzling</li> </ul>

**Table 3: Four approaches to project evaluation**

Figure 2 and Table 3 are based on extant literature within the areas of project evaluation summarized in Table 1 in Section 2.

The process approach focuses on the mechanisms of projects, i.e. how the project is conducted (Chen, 2015). As Table 1 shows, the process approach can evaluate project (management) success in terms of efficiency: doing things right (Zidane & Olsson, 2017). The Iron Triangle comparing expected and realized cost, time and quality (Atkinson, 1999) is one example of process evaluation – but the approach is more than that. It goes beyond that kind of objective-based evaluation (Dahler-Larsen, 2013) to encompass project mechanisms like practices and behavior. It covers what is referred to as “white-box evaluation” (Chen, 2015). In contrast to summative black-box evaluation, white-box evaluation can explain what goes on inside the project – between input and output, as illustrated in Figure 1.

The outcome approach focuses on the effects and impacts of projects: what the project creates (Chen, 2015). As Table 1 shows, the outcome approach can evaluate project success in terms

of effectiveness: doing the right things (Zidane & Olsson, 2017). The Square Route encompassing sustainability as well as direct (organizational) and indirect (societal) effects (Atkinson, 1999) are examples of outcome evaluation – but the approach is more than that. It also considers other success criteria, such as meeting self-defined success factors (Müller & Turner, 2007a, 2010) and the project’s overall purpose as well as developing ideas (Joslin & Müller, 2016) in addition to reoccurring collaboration with, and satisfaction of, clients, customers, suppliers, the core project team and other stakeholders (Müller & Turner, 2007a, 2007b, 2010). Moreover, outcome evaluation moves beyond traditional objective-based evaluation (Dahler-Larsen, 2013) to consider the value (Laursen & Svejvig, 2016) of the project’s realized and potential changes – despite the targets at the beginning of the project when least is known about the project and its conditions (Christensen & Kreiner, 1991).

The benchmarking approach distinguishes one or several projects and compares it/them to a larger group of projects (Barber, 2004). A benchmark has no predefined set of measures but may rely upon one or more process or outcome approaches. In the literature, both internal and external benchmarking are often mentioned. As Table 1 shows, these terms typically refer to the organizational boundary (Barber, 2004; Dahler-Larsen, 2013). While this is a vital boundary and there are good reasons for considering it, it is not the only boundary, and in some cases, other boundaries may be more relevant. For instance, many projects exist *on* the boundary in the sense that they are cross-organizational and run in collaboration with multiple organizations. Other distinctions include geography (comparing local, national, regional, international or global projects), competition (comparing projects within or across the public/private sector, a product/service trade or one or more specific industries), type (comparing innovation, development or optimization projects) and size (comparing small, medium, large or mega projects in small, medium or large organizations). Dimensions such as project complexity

(Fangel, 2010), pace, novelty and technology (Shenhar & Dvir, 2007), as well as contract type or project length, can also be used to divide projects into benchmarking groups. In essence, there is no limit to the comparison dimensions. In our conception of benchmarking, internal benchmarking is different from external benchmarking in the degree of similarity. In extreme internal benchmarking the reference group exists of very similar projects (for instance, within a project portfolio or program). In extreme external benchmarking the reference group exists of very different projects (for instance, in a global database).

The fourth evaluation approach relates to learning. The OECD description of evaluation explains how central learning is to evaluation: “*An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision-making process*” (OECD, 2010, p. 22). Contrary to the tendency to consider project evaluation as a retrospective and conclusive take on a project, this definition points forward in time and to the constructive applicability of project evaluation (Chen, 2015). Learning from projects builds dynamic capabilities (Teece, Pisano, & Shuen, 1997) which equips the organisation to meet the future (Schlichter, Svejvig, & Laursen, 2015). According to Prahalad and Hamel (1990, pp. 1-2): “*A company’s competitiveness derives from its core competences... (which are) the collective learning in the organization*”. Seen in this light, learning is key to an organization’s competitive advantage, and as projects become the dominant form of operationalizing high-priority strategic must-win battles, learning in and from projects becomes even more important. Therefore, we recommend working strategically with learning to utilize the value (Laursen & Svejvig, 2016) of lessons learned throughout the project life cycle and beyond. The fourth approach welcomes curiosity and reflective questions that can challenge existing knowledge and bring about valuable learning of strategic importance. Instead of relying on single-loop learning alone, it paves the way for double-loop learning: “*reflection on the dominant or stated*

*values, beliefs and norms*” (Argyris 1996 in Shaw, Greene, & Mark, 2006). Instead of focusing on patterns, it looks for puzzles: for clues of disconfirmation (Vygotsky 1978 in Shaw et al., 2006) that can challenge preexisting worldviews. “*It is learning by exception, contradiction, or surprise*” (Shaw et al., 2006, p. 78). Instead of viewing disconfirming facts as noise, the learning approach takes a skeptical stand towards generalization and considers exceptions as opportunities for reflection. Such learning in and from projects could be formalized by using professional guidance such as PMI’s PMBoK (Project Management Institute, 2017) and PRINCE2 (Office of Government Commerce, 2017), as well as the systemic lessons learned knowledge model (Duffield & Whitty, 2016; Duffield & Whitty, 2015), a cross-project learning framework (K. Cooper, Lyneis, & Bryant, 2002) or debriefing methods (Schindler & Eppler, 2003). But at the end of the day, much learning is and will be passed on in more informal ways through daily social activities of normal project work (Hartmann & Dorée, 2015).

None of the four approaches outlined above are new in themselves. The novelty lies in the act of combining all the approaches in one framework. Bringing each approach into one coherent framework enables the evaluator to see one approach as part of a bigger picture and in relation to another – revealing both the benefits and limitations of each approach. Although a whole or holistic understanding can never be achieved, we strongly encourage evaluators to combine approaches to avoid fragmented conclusions and arrive at deeper and broader evaluations. It is our hope that the multidimensional framework can contribute by offering four approaches to project evaluation that can help structure viable project evaluations by revealing insightful angles or hidden aspects. The four approaches are ideal types of different and distinct project evaluation approaches. In reality, approaches are not clearly distinguishable and in practice they overlap. This point is illustrated in the intertwined circles of the diagram and outlined in the

following section – where we present an instantiation of the framework and explain how it is used to structure a large evaluation study of a new project methodology.

## **5. Project Evaluation Framework Instantiation**

The project evaluation framework originated from a Danish initiative to design a new project methodology and implement it in 16 pilot projects and organizations as described in the research methodology in section 3.

In this section, we illustrate how the project evaluation framework was used as an artifact to guide project evaluation in the Danish initiative. Thus, we move from the abstract domain to the instance domain (Lee et al., 2011) with a specific application of the project evaluation framework. The aim of the Danish initiative was to increase the impact and speed of projects by developing, implementing and evaluating a new project methodology. The task of the research team was to evaluate the extent to which the 16 pilot projects implementing the new project methodology were able to deliver benefits faster than three reference projects within the same organization (Svejvig, Geraldi, & Grex, 2019).

Figure 4 shows how the artifact was used to design a viable project evaluation framework that compares pilot and reference projects within and across organizations to test the new project methodology.

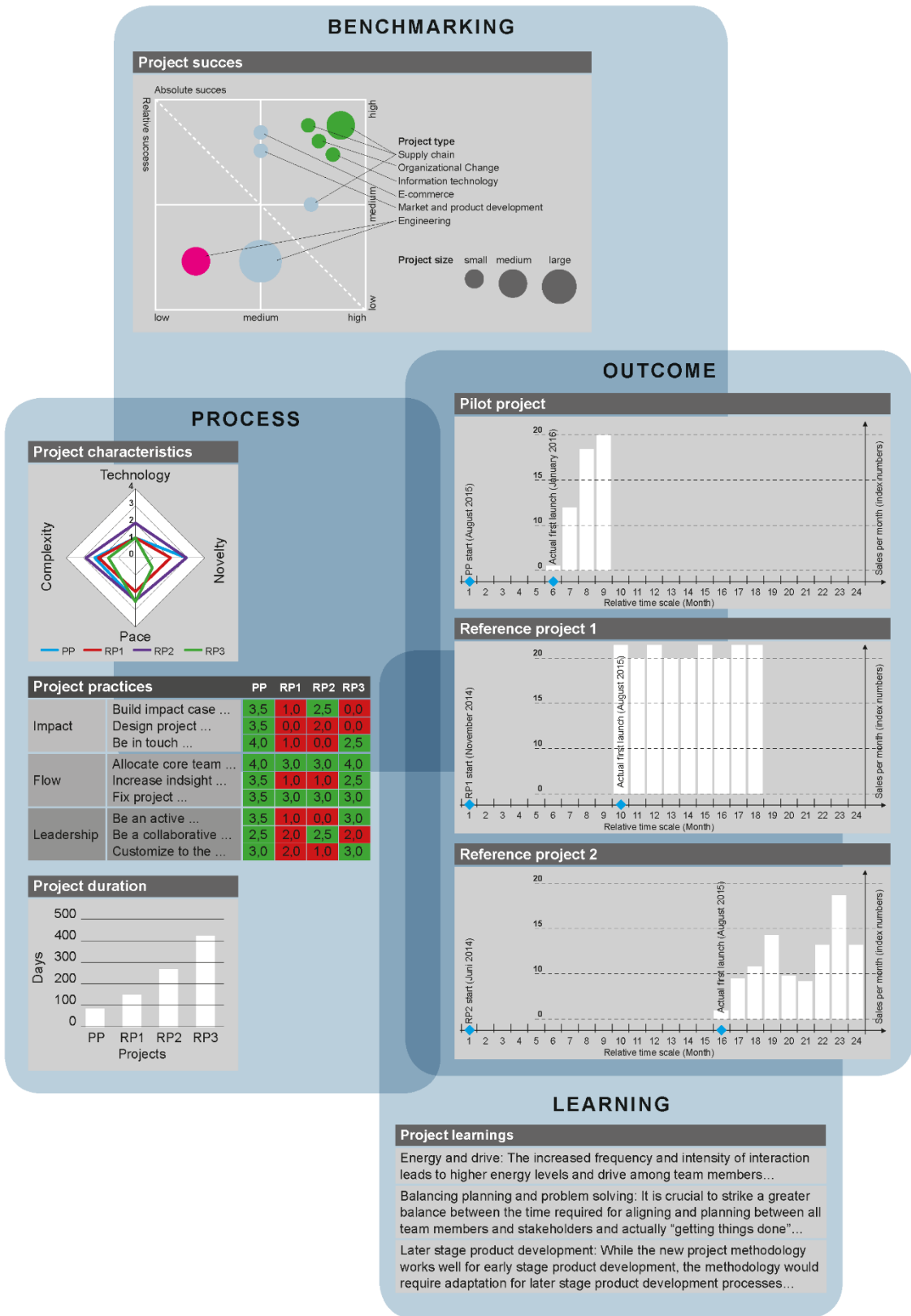


Figure 4: Project Evaluation Framework Instantiation

The process frame in Figure 4 includes three elements. The radar chart shows the Diamond model, which is used to outline project characteristics on four dimensions – namely novelty, pace, technology (Shenhar & Dvir, 2007) and complexity (Fangel, 2010). These measures are used to compare the similarity of the projects and rank them relative to each other. The table shows different scores of project practices that are used to elicit the degree to which the projects follow the new project methodology. The green scores above 2,5 correspond to a high level of adherence whereas the red scores below 2,5 correspond to a low level of adherence to the new project methodology. These practice scores hold the potential to further illuminate white-box project evaluation (Linzalone, Harri Laihonen, & Schiuma, 2015) and explain what goes on in the project. Finally, the bar chart shows project periods corresponding to time in the classical Iron Triangle (Atkinson, 1999). The bar chart shows that the pilot project has the shortest time period compared to two similar reference projects within the same organisation.

The outcome frame focuses on the impact (Laursen & Svejvig, 2016) of one pilot project and two reference projects. The bar charts show the performance of projects on a common key performance indicator (KPI), in this case operationalized as indexed sales per month shown on a standard 24-month scale. The columns show when and how much sale is generated in each project until May/June 2016. The number of columns does not represent the length of the sales period, but the number of months' data are available. As can be seen from the bar charts, time to impact, meaning the period from the projects' start to the first sale is generated, is considerably shorter in the pilot project than in the two reference projects. Whereas the reference projects start generating sales in months 10 and 15, the pilot project starts generating sales only after six months. The sales volume per month is highest in reference project 1 and lowest in reference project 2, whereas the pilot project scores somewhere in between.



The benchmarking frame shows intra- and inter-organizational project comparisons. The data behind the matrix are the process and outcome evaluations shown and described above. The matrix shows three comparisons – based on the relative and absolute performance of nine pilot projects in nine organizations. First, absolute pilot project success is an intra-project comparison based on an evaluation of each pilot project’s ability to fulfill its own success criteria – measured on an ordinal scale ranging from fulfilled to not fulfilled. Second, relative pilot project success is an inter-project and intra-organizational comparison – also referred to as internal benchmarking (Barber, 2004). It is based on KPI measurements – like sales per month visualized in the outcome frame and explained above. Third, the mapping of the pilot projects in the matrix is an inter-project and inter-organizational comparison – also referred to as external benchmarking (ibid.). The colors of the projects indicate the pilot projects’ performance on both parameters: absolute and relative. The red pilot project scores low on both absolute and relative success. The four yellow pilot projects score low or high on one parameter or medium on both parameters. The four green pilot projects score high on both absolute and relative success. The size and type of project are also illustrated – in order to derive common patterns among high-performing pilot projects. The mapping of all the pilot projects can be summarized to conclude that seven out of nine projects (above and to the right of the dotted line) are either absolutely or relatively successful while four (green) projects are both absolutely and relatively successful. These benchmarking results are used to point towards the applicability and workings of the new project methodology.

The learning frame lists some of the learning points from a specific pilot project. The learning approach is suitable for collecting qualitative data, which can be used in constructive (Chen, 2015) and formative evaluation in order to improve current and future projects and situations (Stufflebeam & Shinkfield, 2007). Examples of learning points include: 1) how to generate

higher energy and drive; 2) how to balance planning and problem solving; and 3) how to adopt the new project methodology to later-stage product development.

The instantiation in Figure 4 shows that the four approaches overlap each other. For instance, the process and outcome analyses are also benchmarking. Thus, the instantiation of the project evaluation framework illustrates the blurred boundaries of the approaches as ideal types – that materialize as hybrids in practice.

## **6. Towards Design Principles for Project Evaluation**

Section 4 presented the project evaluation framework as an artifact: a general method or model (Gregor & Hevner, 2013) for constructing project evaluations.

Section 5 illustrated an application of the project evaluation framework – a concrete instantiation (ibid) of the project evaluation framework in use.

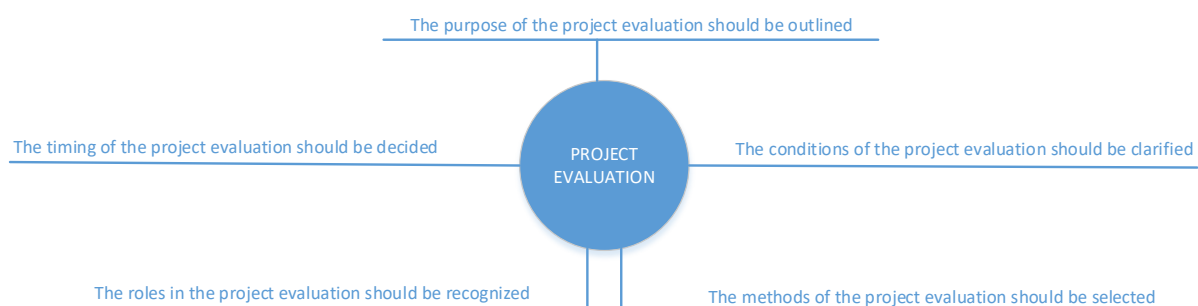
The current Section 6 moves up towards the third and final operationalization level (Pries-Heje & Baskerville, 2008) towards a more general and abstract design theory (Gregor & Hevner, 2013). In this section we take the first step in formulating a set of design principles for designing viable project evaluations. The design principles should not be seen as a coherent and complete design theory – but as an initial step towards such a design theory. The design principles are extracted from the project evaluation framework and its instantiation to arrive at a more general answer to the research question in addition to the more specific answers provided in the previous Sections 4 and 5.

Based on Walls et al.'s (1992, p. 36) formal definition of a design theory – to be “*a prescriptive theory which integrates normative and descriptive theories into design paths intended to produce more effective [artifacts]*” or in this case project evaluations, we consider design principles to be these design paths. Thus, design principles pertain to the process aspect of

design – as explained by Walls et al. (1992). A design theory consists of a design method that is “[a] description of procedure(s) for artifact construction” (Walls et al., 1992, p. 43). We consider such a design method to be equivalent to a set of design principles – which can be used to develop an artifact (Hevner, March, & Park, 2004, p. 97) to support project evaluation and help project evaluators design viable project evaluations.

Grounded in the experience of developing and applying the project evaluation framework as well as extant literature on projects, evaluation and project evaluation, the authors do in individual and common brainstorming to arrive at a comprehensive list of dimensions to consider when designing project evaluations – shown in Appendix C.

Based on this initial attempt to elicit a set of design principles we derived a second-order net list and propose the design principles for project evaluation models shown in Figure 5 and explained below.



**Figure 5: Design principles for project evaluation models.**

*First* of all, the purpose of the project evaluation has to be outlined. It should be considered why a project evaluation should be done. What is the intension of the project evaluation (Linzone & Schiuma, 2015, p. 92): what learning will the project evaluation create and why – and how will that learning be applied (Dahler-Larsen, 2013) to create what value for whom where and when? Is the evaluation constructive or conclusive (Chen, 2015)? It is also important to explicate any norms (Linzone & Schiuma, 2015, p. 92) that directly or indirectly guide the

project evaluation. It can be conscious and official ideologies or political stands (Dahler-Larsen, 2013) but also unofficial and unconscious institutionalized rules and basic assumptions (Zidane et al., 2016, p. 28). No matter the form, it is helpful to explicate such norms – as they can be quite powerful in guiding the evaluation, for instance in terms of setting evaluation criteria and defining project success and failure.

*Second*, the method of the project evaluation has to be selected. It should be considered what project(s) and aspect(s) to evaluate. The evaluand needs to be defined – in this case: a project. In theory, several project definitions exist, but our work in practice showed that boundaries in and around a project are seldom clear. They are socially constructed and subject to negotiation. For instance, when does a project start and when does it end? What is a project in that defined period and what is something else? A system view on a project (Figure 1) can help evaluators consider different elements of a project that could be evaluated. Moreover, evaluators need to select one or more approaches. What will the project evaluation focus on? Will the project evaluation be black-box outcome evaluation, white-box process evaluation or a hybrid of both (Chen, 2015)? Should one project be evaluated in absolute terms or will several projects be evaluated in a relative view? Will the project evaluation take an objectivist approach or a subjectivist approach (Ika 2009 in Zidane et al., 2016, p. 28)? What methods are available and realistic (Dahler-Larsen, 2013): qualitative, quantitative or mixed methods? In the ideal case, all aspects are covered in a multidimensional and triangulated project evaluation (Bechara & Van de Ven 2011 in Joslin & Müller, 2016). In reality, however, project evaluations never become whole or holistic. At the end of the day, the evaluator has to choose between countless approaches and decide on one project evaluation solution to a given project evaluation problem.

*Third*, the timing of the project evaluation has to be decided. It should be considered when to evaluate a given project. Will the evaluation be one snapshot or several pictures of the project

or will it be based on an ethnographic longitudinal study? Some project evaluations are done early in the project life cycle or even before the project starts (Samset, 2003) to prioritize resources (R. G. Cooper et al., 2000; Engwall & Jerbrant, 2003) and projects (Baker & Pound, 1964), while other project evaluations are done very late in the project life cycle or even after the project has ended (Atkinson, 1999). As projects are processes that constantly change, decisions on design principles, including timing, can be difficult to plan in advance when least is known (Christensen & Kreiner, 1991). Our project evaluation work in practice has shown that the initial plan sometimes needs to be adjusted along the way.

*Fourth*, the roles in the project evaluation need to be recognized. It should be considered who participates in the project and the evaluation. Is it a single evaluator and a large and diverse group of informants – or the reverse? Project evaluation roles are those, for instance, of project stakeholders including the project team, manager, owner, steering committee and end-users as well as evaluation stakeholders including informants (enlightening the evaluation), authors (constructing the evaluation) and users (applying the evaluation). As project evaluation involves personal values of both those whose activities are being evaluated and those who are doing the evaluation (Suchman 1967 in Zidane et al., 2016) it is important to consider who should perform and who should inform the project evaluation. Success is an opinion that can change over time (Myers 1995 in Zidane et al., 2016) and as different project and evaluation stakeholders have different opinions, they might come to different conclusions (McLeod et al., 2012). Project evaluation can be regarded as efforts by a group of stakeholders to establish their narrative of a project as the legitimate version of events surrounding that project by drawing on objective measures to enroll supporters and marginalize opponents (Wilson and Howcroft 2005 in Zidane et al., 2016). Given the subjective nature of project evaluation, it is important to recognize and take into account the various stakeholders and their roles in project evaluation.

*Fifth* and finally, the conditions of the project evaluation need to be clarified. It should be considered how the project evaluation is constrained and enabled. When the conditions have been defined and analyzed it should be considered how they can be handled in order to meet the project evaluation requirements. Such conditions pertain to resources (Linzalone & Schiuma, 2015, p. 92) like time and money as well as data availability. Should data be constructed or do they already exist – and are existing data publicly available or confidential and difficult to access? Like projects, these conditions can change over time and therefore it is important to be alert to the need to change the project evaluation to accommodate such changes. Evaluators need to continuously reflect on the appropriateness of the project evaluation design. Have the project or context or evaluation situation and circumstances changed – and is it viable to change the project evaluation accordingly?

As the design principles demonstrate, much needs to be considered when evaluating projects. The principles are ideal types in the sense that they represent clear and separate themes to consider. In reality, themes and design principles may overlap. Project evaluation is highly complex (Zidane et al., 2016, p. 28) and designing viable project evaluations is a difficult endeavor. In practice, it comes down to a matter of choice between an unlimited number of alternatives. In this case, project evaluation becomes an exercise of finding the best match: a viable project evaluation design – that reveals valuable insight. In this exercise, balancing and prioritizing become essential. The project evaluation decisions will define and determine how the project evaluation is constructed and what the resulting project evaluation will reveal.

When evaluating projects, different stands and angles reveal different aspects and insights – while leaving others in the dark. It is like the classic application of images as a set of lenses – in which one way of seeing is also a way of not seeing (Morgan, 1997). The proposed design principles serve to guide professionals' decisions towards viable project evaluations. No matter

how and what choices are made, the resulting project evaluation will never be complete. But some project evaluation designs will be better than others – and the design principles are made to assist the project evaluation design process move towards viable project evaluations.

## **7. Discussion and Conclusion**

There are many reasons for evaluating projects and substantial value in viable project evaluations. Therefore, project evaluation is relevant – as a practice and as a research topic. In this paper, we have outlined the progress and challenges of contemporary literature on project evaluation. We have answered our research question in three ways – corresponding to the three design science research contribution types (Gregor & Hevner, 2013). First, we have developed a project evaluation framework exemplified as an artifact and contributed with architecture knowledge. Second, we have illustrated an application of the project evaluation framework exemplified as an instantiation and contributed with a situated implementation of our artifact. Third, we have taken a step towards developing a set of design principles for project evaluation, which can eventually develop into a mature design theory for project evaluation that can assist project practitioners and researchers design viable project evaluations.

The implications of this paper are threefold.

Theoretical implications reside in the prescriptive knowledge creation, which ranges from specific knowledge in the instantiated implementation of the project evaluation framework artifact to abstract knowledge in the development of project evaluation design principles (Gregor & Hevner, 2013). While there are varying degrees of maturity across the approaches of the project evaluation framework, combining four distinct approaches and integrating them into a multidimensional framework for project evaluation is novel and provides new insight into how evaluators can design viable project evaluations.

Practical implications reside in the practical value of the project evaluation framework artifact, instantiation and design principles, which materializes when practitioners use one or more of these three contribution types to guide them towards viable project evaluations. By designing a project evaluation framework encompassing different and multiple approaches to project evaluation, the paper aims to address practical project evaluation challenges and advance real-life project evaluation by inspiring project evaluation stakeholders – such as project, program and portfolio managers.

Methodological implications reside in the application of an unprecedented methodology to advance research on project studies – namely action design research (ADR) (Sein et al., 2011). The paper contributes methodologically to theory on project studies in general by applying and illustrating how ADR can be used to generate useful knowledge – in this case in the form of a project evaluation framework artifact and an instantiation illustrating its applicability, as well as design methods in the form of design principles to develop prescriptive knowledge (Gregor & Hevner, 2013, p. 344). To the best of our knowledge, ADR has not yet been applied within the project management domain, although it is a recognized and used methodology in a related discipline – namely the information systems domain. We believe project scholars can apply ADR to create useful descriptive and prescriptive project knowledge at all three research contribution levels (Gregor & Hevner, 2013). We propose ADR as a method for balancing the dilemma of rigor or relevance (Sein et al., 2011) in project studies by conducting research that simultaneously satisfies needs for theorizing projects while recognizing the situated embeddedness of projects as context-dependent empirical phenomena.

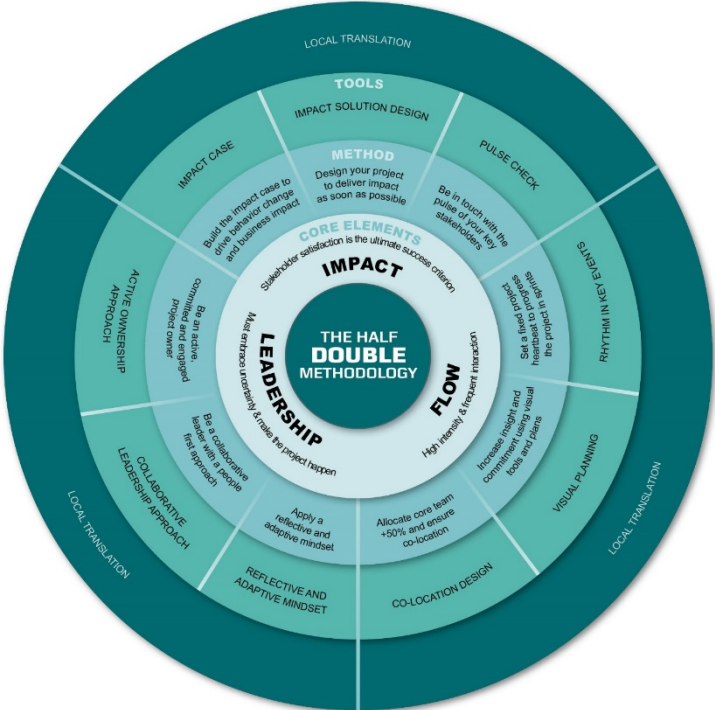
The limitations of this paper are two-sided. In terms of the project evaluation framework artifact, it is only instantiated in one project evaluation study and although it is a quite comprehensive study covering 16 organizations and 68 projects, the application is restricted to



the context in, and task for, which the artifact is designed. While the instantiation works to solve the research task and can be considered a proof of concept focusing on the internal validity of the framework – meaning that the artifact works and does what it is supposed to do (Gregor & Hevner, 2013, p.: 351) – it is considered a limitation that the framework has not yet been instantiated outside the domain in and for which it is developed. Thus, one avenue for further research is to show whether the artifact also has value outside the development and application environment – to document its usefulness in terms of its utility (Gregor & Hevner, 2013). In terms of the design principles, they are only a first draft and have not yet been implemented and evaluated in practice. They represent an initial step towards a more mature design theory for viable project evaluations. Thus, a second avenue for further research is to implement and evaluate the design principles in one or more project evaluations. It might be that the principles will have unintended and unanticipated consequences (Sein et al., 2011) and that it makes sense to revise these design principles and generate a refined version in order to arrive at a coherent design theory for project evaluation.

**Appendix A**

This appendix outlines the new project methodology – which is illustrated in its core elements and respective methods and tools in Figure A1.

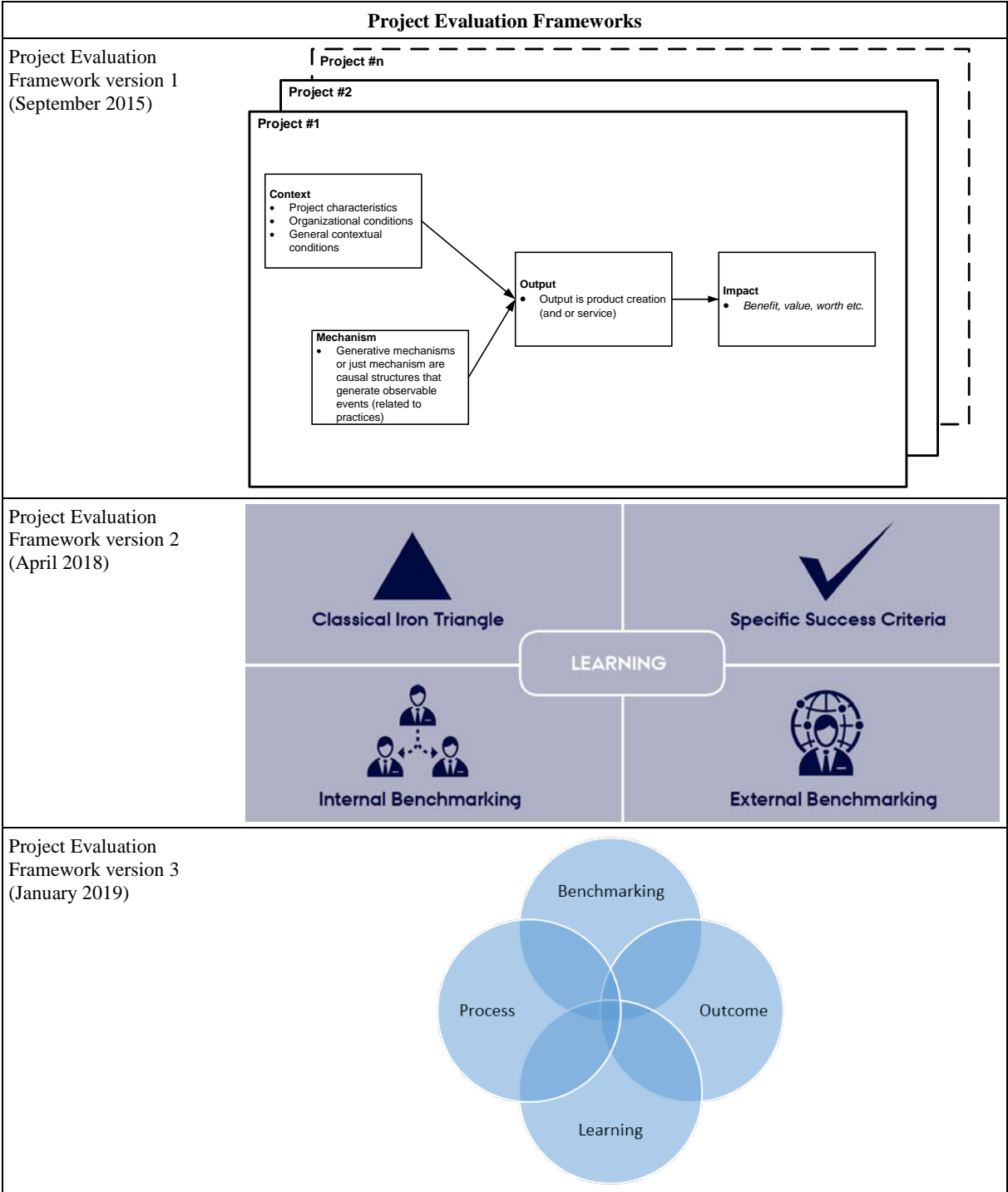


**Figure A1: Half Double Methodology**

Figure A1 shows how the new project methodology evolves around three main elements: impact, flow and leadership. The new project methodology is an add-on supplement to existing project methodologies and organizational governance structures. For more details on the new project methodology, please see Report 1 (Svejvig et al., 2016), Report 2 (Svejvig, Rode, et al., 2017), Report 3 (Svejvig, Adland, et al., 2017), the Half Double book (Olsson, Adland, Ehlers, & Ahrengot, 2018) or the public web page: <https://www.projecthalfdouble.dk/>.

**Appendix B**

This appendix illustrates the evolution of the project evaluation framework – which is illustrated in its first, second, and third and final version in Figure B1.



**Figure B1: Project Evaluation Framework Versions**

## Appendix C

This appendix shows the outcome of the individual and collective brainstorming exercise as a first-order net list of dimensions to consider when designing project evaluations – which is shown in Table C1.

#	DIMENSIONS	POLES	
1	Parameter	Specific (idiographic – particular)	General (nomothetic – universal)
2	Perspective	Internal	External
3	Breadth	Narrow	Broad
4	Depth	Deep	Shallow
5	Stakeholders	Few	Many
6	Philosophy	Subjective (constructivist)	Objective (positivist)
7	Data	Qualitative	Quantitative
8	Availability	Available data	Unavailable data
9	Design	Flexible	Fixed
10	Method	Applying old methods	Developing new methods
11	Decisions	Dictatorial	Democratic
12	Funding	Dependent (commissioned)	Independent (not commissioned)
13	Emphasis	Appraisal (positive)	Critical (negative)
14	Purpose	Conclusive (descriptive – understanding)	Constructive (prescriptive – developing)
15	Causality	Probabilistic	Deterministic
16	Generalizability	Specific	Universal
17	Context	Situated	Not situated
18	Place	Local	Global
19	Time	Short-term	Long-term
20	Focus	Processes (means)	Product (end)

**Table C1: Project Evaluation Design Dimensions**

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