HALF DOUBLE *Institute*

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Project Half Double

Mid-term Evaluation of Phase 3 and Consolidation of Phase 1, 2 and 3

INDUSTRIENS FOND FREMMER DANSK KONKURRENCEEVNE
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CONFLICT OF INTEREST

The authors declare no conflict of interest regarding the funding agency, Implement Consulting Group or any other parties involved in Project Half Double.

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Executive Summary

By Anna Le Gerstrøm Rode (Aarhus University)

Project Half Double (PHD) has a clear mission: to define a project management methodology that can deliver "*Projects in half the time with double the impact"* where projects in half the time should be understood as half the time to impact (Rode et al., 2019, p. 5). These targets were reached during phase 1 and 2 of PHD.

This report is the first publication of phase 3. The purpose of phase 3 is *to diffuse and broaden Half Double to a number of small and medium sized organizations to reach a tipping point, thus creating a sustainable business model in which the concept of Half Double can continue as a self-sustaining and independent entity*. This report presents an evaluation of 75 projects and 67 organizations working with the HDM over five years.

The report provides a short account of the HDM and an update on previous evaluations of the first 16 organizations implementing the HDM. The evaluation shows that, the success rate is high in nine (56%) of the 16 Half Double (HD) projects implementing the HDM. Moreover, almost half (47%) of the HD projects have a higher performance compared to projects not implementing the HDM.

An evaluation of the characteristics of the best HD projects indicates that the HDM seems to work well across a variety of contexts. The indication is strongest in large organizations, within healthcare, electronics, food, and manufacturing industries, and in small and short projects of various types but especially supply chain optimization.

A study of the practices employed in all the evaluated projects shows that all three core principles of the HDM are represented more in the HD projects compared to the reference projects – suggesting that the HDM is a radically different way of managing projects that significantly changes practice as usual. The biggest difference was found for the Impact principle – largely a result of HD projects' intensive use of the Pulse Check practice.

A study focusing on the diffusion of the HDM shows that the HDM has been able to maintain itself in many of the case organizations after the HD projects have finished, but also that it is a challenging task to diffuse the HDM to other project teams and departments.

Finally, a focus on the specific context of small and medium sized enterprises shows that the project performance and success rate in these organizations are not remarkably different from large enterprises. Specifically, five out of nine SME HD projects have a high success rate, and none have a low success rate. Moreover, two out of five SME HD projects where data on comparable reference projects is available have a higher performance, two have a medium performance, and one has lower performance. Together, these evaluations indicate that although introducing and implementing a new methodology like the HDM in the SME context can be a challenge in itself, the results are encouraging. Based on the learnings from this segment, it seems that there is great potential for SMEs embarking on a Half Double journey.

Altogether, the evaluations consolidated in this report are promising regarding the use of the HDM, but they also confirm that "one size" does not fit all.

1 Introduction

By Anna Le Gerstrøm Rode (Aarhus University)

The purpose of this report is to present the results of a mid-term evaluation in phase 3 of Project Half Double (PHD).

The report extends previous evaluations from phase 1 and 2 presented in five earlier reports (Rode, Frederiksen, & Svejvig, 2018; Rode et al., 2019; Svejvig, Adland, Klein, Nissen, & Waldemar, 2017; Svejvig et al., 2016; Svejvig, Rode, & Frederiksen, 2017).

Taken together, these six reports present a comprehensive evaluation of 75 projects and 67 organizations working with the Half Double Methodology (HDM) over a period of five years.

The Half Double journey began in May 2013 when a group of dedicated project enthusiasts asked themselves: How do we create a new and radical project paradigm that can create successful projects? The formal part of PHD was initiated two years later in 2015. At its current stage, it is a three-phase project. Phase 1 ran from June 2015 to June 2016 and included seven organizations with eight pilot projects implementing the HDM and 23 reference projects not implementing the HDM. Phase 2 ran from July 2016 to June 2019 and included nine organizations with 11 pilot projects and 21 reference projects. At the time of writing, we are in the middle of phase 3, which started in August 2019 and is scheduled to end in December 2022. The complete Half Double journey is outlined in chapter 2.

The goal of the current phase 3 is different from the earlier phase 1 and 2 which had a clear mission of creating "*a project methodology that can increase the success rate of projects while increasing the development speed of new products and services".* That target was reached by the end of phase 2 with the formalization of the HDM with the overall aim of delivering "*Projects in half the time with double the impact*" where projects in half the time should be understood as half the time to impact (benefit realization, effect is achieved) and not as half the time for project execution. The complete HDM is presented in chapter 3.

Based on implementation, evaluation and refinement of the HDM in the 16 organizations from phase 1 and 2, the last report concludes "*that The HDM can lead to higher impact – in terms of project speed and/or performance" (Rode et al., 2019)*. This conclusion is confirmed in the overall evaluation in this report of all finalized pilot and reference projects in the 16 organizations of phase 1 and 2. The complete evaluation of pilot project performance and success rate is shown in chapter 4. The following three chapters present further details of the evaluation in these organizations. Chapter 5 elicits the characteristics of high performing and successful pilot projects – to establish the conditions under which the HDM seems to be most effectful. Chapter 6 compares the HDM practices applied in pilot and reference projects – to establish in what way the HDM makes the biggest difference. Chapter 7 follows the HDM as it diffuses within and across organizations – to establish the reasons for adopting the HDM.

The overall purpose of the current phase 3 is to establish ground for the methodology to continue in an independent *Half Double Institute*. In other words: *"The purpose of phase 3 is to diffuse and broaden Half Double to a number of small and medium enterprises (SMEs) to reach a tipping point, thus creating a sustainable business model in which the*

concept of Half Double can continue as a self-sustaining and independent entity."

The current findings from the SME setting are presented in chapter 8 which reveals the preliminary learnings from the first nine SME pilot projects. Note that in this phase 3, the word "pilot" project loses part of its original double meaning of testing both the HDM in itself but also the organizational context in which it is implemented: in this third phase, the HDM is mature and hence, the word pilot only refers to testing the HDM in a new context. Consequently, in this report we use the term "Half Double projects" to signify this change. In essence, the meaning of the two words (pilot project and HD project) is the same: projects applying the HDM.

The overall status of phase 3 of PHD in terms of reaching its overarching goal is outlined in a formative evaluation presented in chapter 9 which ends with a list of challenges accompanied by possible explanations and inspiration for further improving the rest of phase 3.

Behind PHD is the Half Double Institute which was launched in March 2020 as an important milestone on the way to reaching the overall target of phase 3. The institute is an impartial and non-profit foundation with the purpose of increasing the rate of success in projects through free dissemination of materials on the HDM as well as training and certification. The institute rests on a collaboration between Implement Consulting Group, the Danish Project Management Association, the Danish Industry Foundation, and Aarhus University. Roles and responsibilities are divided between these four partners. Implement Consulting Group serves as the overall project leader on PHD and establishes collaboration with new partners as well as HD project organizations implementing the HDM. The Danish Project Management Association serves as the primary manager of the certification and guarantees its quality. The Danish Industry Foundation, an independent philanthropic foundation, contributes financially with 2.1 million euros to sponsor the third phase of PHD. Finally, Aarhus University serves as the principal investigator evaluating the HDM and as the editorial team of this report.

The team of researchers at Aarhus University evaluating PHD has over the last five years participated in several activities to generate and analyze data and disseminate results. These activities have resulted in a long list of research publications – which is shown in appendix A and divided into two parts: 1) publications for practitioners like this report and including the previous reports mentioned earlier 2) publications for academics covering peer reviewed conference proceedings and journal articles.

It is important to note that while this report is reviewed in the organizations contributing to it, the report has not been through an academic peer review process. Consequently, the work presented in this report cannot be regarded as finished research results according to guidelines from Aarhus School of Business and Social Sciences. Rather, the work presented in this report should be regarded as work in progress. Hence, words such as "research", "results", and "findings" are rare in this report and, when they occur, should be interpreted in accordance with the guidelines. In general, this report follows the policy for research integrity, freedom of research and responsible conduct of research at Aarhus University (2019), Universities Denmark's Principles of Good Research Communication (2019) and the Danish Code of Conduct for Research Integrity by The Ministry of Higher Education and Science (2014).

The overall research methodology behind the work presented in this report is presented in Appendix B. The overall engaged scholarship approach as well as the paradigmatic stance following pragmatism are introduced. Moreover, Appendix B explicates the mixed methods including the variety of different data generation and analysis methods applied. It should be noted that the report is finalized in January 2021, which means that data after this point in time are not included in the report. The general research limitations of the work presented in this report are described in Appendix C. There is always a degree of uncertainty associated with research. This is certainly also the case for the work presented in this report. We strongly encourage the reader to carefully consider the limitations presented in Appendix C. The report can be read from the beginning to the end, but each chapter can also be read as a separate entity on its own

2 Telling the Half Double Story

By Anna Le Gerstrøm Rode (Aarhus University)

This chapter tells the story behind Project Half Double (PHD) and outlines the overall mission and specific purpose of the current phase 3. It situates this report within the larger picture of a longitudinal, comprehensive and collaborative action design research project and provides a stakeholder map showing the various parties playing a role in the overall project.

PHD was not named Half Double (HD) from the beginning. It started as a Danish initiative in an informal network of project practitioners in 2013. In the network participated very committed people at different levels who discussed how to develop project management in the light of the high failure rate of projects, and with the ambition to manage projects in a radically different way. One of the participants from the early period described the initiative as a kind of "hobby project where project fellows share ideas." The initiative was centered on a Scandinavian-based management consultancy company with approximately 500 consultants named Implement Consulting Group. The initiative matured and began gradually to formalize during the spring of 2014. At that time, it was called "Project 2.0."

The initial work manifested into a proposed solution to the experienced project management problems. The solution was inspired by lean thinking and comprised of ten pieces of advice. Therefore, it was labeled "The ten leading stars". The stars were discussed and developed at different workshops from February 2014 to January 2015. Workshop participants had a broad background within manufacturing, finance, insurance, information technology, public administration, management consultancy, universities and the confederation of Danish industry. The early conception of the stars served as a good starting point for the project. However, as the stars were a mixture of principles, methods and mind-setting statements, they were difficult to communicate and apply efficiently in project settings. Therefore, a motive to develop and conceptualize the proposed solution even further arose. To support the initiative, discussions with the Danish Industry Foundation, an independent philanthropic foundation, started in the fall of 2014.

In the spring of 2015, the discussions materialized in a grant from the Danish Industry Foundation supporting the initiative with 13.8 million Danish kroner (1.9 million euros). In this contract the initiative was named "Project Half Double" based on the argument that the name is appealing and reflects the high ambition: "Projects in half the time with double impact. Together we will develop a new and radical project paradigm to increase the competitiveness of the Danish industry" (Svejvig et al., 2016). The catchy name and slogan needs a clarification: projects in half the time should be understood as half the time to impact (benefit realization, effect is achieved) and not as half the time for project execution.

The first phase of PHD officially started in June 2015 and ended in June 2016. In this phase, the ten leading stars were translated into a more operational methodology labeled the Half Double Methodology (HDM) having three focus areas: Impact, Flow and Leadership. Impact means focusing on stakeholder satisfaction, flow ensures project progression, and leadership is about people (Rode et al., 2019). The three focus areas are later referred to as core elements or principles. Each principle is developed into three methods.

Each method has an associated tool. Hence, the leading stars are developed into the HDM consisting of three abstract principles, nine methods and nine concrete tools. The HDM was implemented in seven pilot projects from seven organizations. Consultants from Implement Consulting Group supported the implementation and worked closely with project practitioners from the pilot organizations. The research team was responsible for evaluating the pilot projects with the purpose of testing this new way of working in projects. The pilot projects were real and important projects and not small or insignificant project experiments. To conduct the evaluation, the research team developed a project evaluation framework (Laursen, Svejvig, & Rode, 2017; Svejvig & Hedegaard, 2016). The main logic behind the evaluation is to compare the pilot projects in each organization with a group of preferably three comparable reference projects within the same organization. The reference projects are as identical with the pilot project as possible except from the project management practices – which follow the HDM in the pilot project. The results of these pilot projects are compared to the pool of reference projects' results and in cases where there is a positive performance difference in favor of the pilot project it is examined to what degree it is reasonable to infer that the reason behind the superior performance lie in the project management practices – hence the HDM. The overall results of the first seven evaluations are documented in the first two reports on PHD (Svejvig et al., 2016; Svejvig, Rode, et al., 2017).

The first phase developed into the second phase which ran from July 2016 to June 2019. In this phase, the HDM was implemented and evaluated in an additional nine organizations. The evaluation followed the methodological design developed in the first phase but supplemented the internal comparisons of projects within each organization with an external comparison between organizations (Rode & Svejvig, 2018). The overall results of the evaluations in the seven and nine organizations of phase 1 and phase 2 are documented in report three and four on PHD (Rode et al., 2019; Svejvig, Adland, et al., 2017). The main conclusion in the last report summarizing the 16 phase 1 and phase 2 projects is that the HDM can lead to higher impact, compared to projects in the same organization not applying the methodology (Rode et al., 2019)

The second phase developed the desire to continue the journey even further. Therefore, discussions with the Danish Industry Foundation continued and materialized into an agreement to fund the project with additionally 15.8 million Danish kroner (2.1 million euros). The second grant started phase 3 which began in August 2019 and is scheduled to end in December 2022. The overall vision of increasing the success rate of projects in the business sector remains the same though phase 3, but the purpose of phase 3 is different and concentrates on diffusing the HDM. Focus is primarily on small and medium sized enterprises (SMEs) because there is a substantial potential in increasing the project success rate in this segment in specific. Additionally, the objective is further diffusion of the HDM and creation of an independent Half Double Institute with HDM certifications in order to prepare the ground for the HDM to sustain and continue to increase impact and reduce time in projects. In other words: *"The purpose of phase 3 is to diffuse and broaden Half Double to a number of small and medium sized organizations to reach a tipping point, thus creating a sustainable business model in which the concept of Half Double can continue as a self-sustaining and independent entity."* The research team is responsible for the evaluation of the extent to which the goals of phase 3 are achieved. The last chapter of this

report provides a formative evaluation showing the status halfway into phase 3 as well as current challenges and opportunities for improving the rest of phase 3.

Table 2.1 summarizes the journey behind PHD as it outlines the three phases as well as the participants and published reports and evaluation results in each phase.

The table situates this fifth report within the larger picture of a comprehensive, longitudinal and joint action design research project.

PHASE	ONE	TWO	THREE
TIME	2015-2016	2016-2019	2019-2022
PARTICIPANTS	Participants of all three phases are primarily practitioners from case organizations including project owners and managers as well as consultants.		
	• 7 organizations • 8 HD projects • 22 reference projects	• 9 organizations • 11 HD projects • 21 reference projects	• 1,000 organizations (target) • 50 HD projects (target)
EVALUATIONS	For a complete overview of all evaluations in PHD see the practice reports in appendix A.		
	Out of six HD projects, four appear to have benefited from using the HDM and two seem to have little effect of using the HDM.	Out of 15 HD projects, nine fulfill most of their success criteria, four fulfill some of their success criteria and two fulfill few of their success criteria. Out of 13 HD projects, seven have a higher performance, two have a medium performance and four	Out of 16 HD projects, nine have a high success rate, five have a medium success rate and 2 have a low success rate. Out of 15 HD projects, seven have a higher performance, three have a medium performance and five
PUBLICATIONS	For a complete overview of all publications on PHD see the list of publications in appendix A.		
	• First report on phase 1 (Svejvig et al., 2016) • Second report on phase 1 (Svejvig, Rode, et al., 2017)	• First report on phase 2 (Svejvig, Adland, et al., 2017) • Second report on phase 2 (Rode et al., 2019)	• First report on phase 3 (this report) • Second report on phase 3 (forthcoming report)

TABLE 2.1: PROJECT HALF DOUBLE PARTICIPANTS, EVALUATIONS AND PUBLICATIONS

Besides the participating organizations described in the PHD story and listed in table 2.1, a large number of stakeholders are associated with PHD. These stakeholders play a more or less central role in each of the three phases. A complete stakeholder map covering all three phases of PHD is illustrated in figure 2.1.

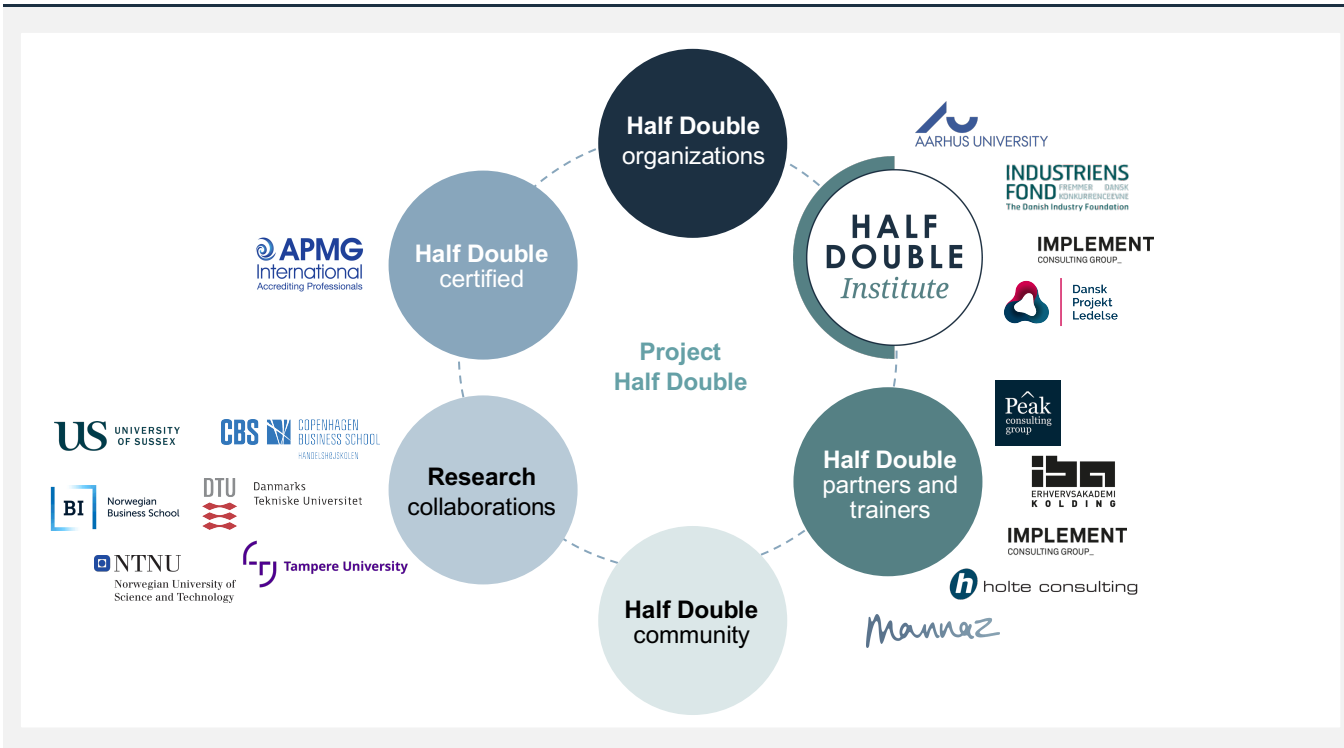


FIGURE 2.1: PROJECT HALF DOUBLE STAKEHOLDER MAP

3 Presenting the Half Double Methodology

By Thomas Kristian Ruth and Karoline Thorp Adland (Implement Consulting Group)

The Half Double Methodology (HDM) in its latest "ready to go live" version is presented in figure 3.1: A methodology demanding a strong focus on three core elements combining "reduce time to impact", "keep the project in motion" and "promote the leadership of people rather than the management of technical deliverables". Each core element puts forward a principle – a non-negotiable standard – for how we are to lead our projects. Each principle is directly linked to a method – a proposed approach, procedure or process for bringing the principles to life in practice. Each method is supported by a tool – a specific instrument – aimed at easing implementation. Bear in mind that we emphasize the evolving nature of the concept as the methodology is in continuous development – never set in stone. Rather, it is constantly inspired by – and adapted to – new insights and learning from practice and from our community of engaged project practitioners.

The concept takes us from the core – the non-negotiable standards we bring into all projects – to the localization where we adapt the methods and tools to fit local cultures and practices. The further we move away from the core elements and into the outer circles, the more flexible we become in terms of which approaches and tools to apply. We propose that each project apply an Impact Case to drive business impact and behavioral change but remain open to the idea of applying the organization's own Business Case template if it is the preferred tool; however, it must embrace behavioral change to be applicable. Hence, the actual implementation and adaption require reflection and translation to work in the local context. Each of the three core elements and their associated principles, methods and tools are elaborated on in the next section.

A more in-depth understanding of the methodology and examples of how it has been translated into practice is available in the Half Double Handbook which can be downloaded from the Half Double homepage www.halfdoubleinstitute.org and in the Half Double Book (Olsson, Adland, Ehlers, & Ahrengot, 2018).

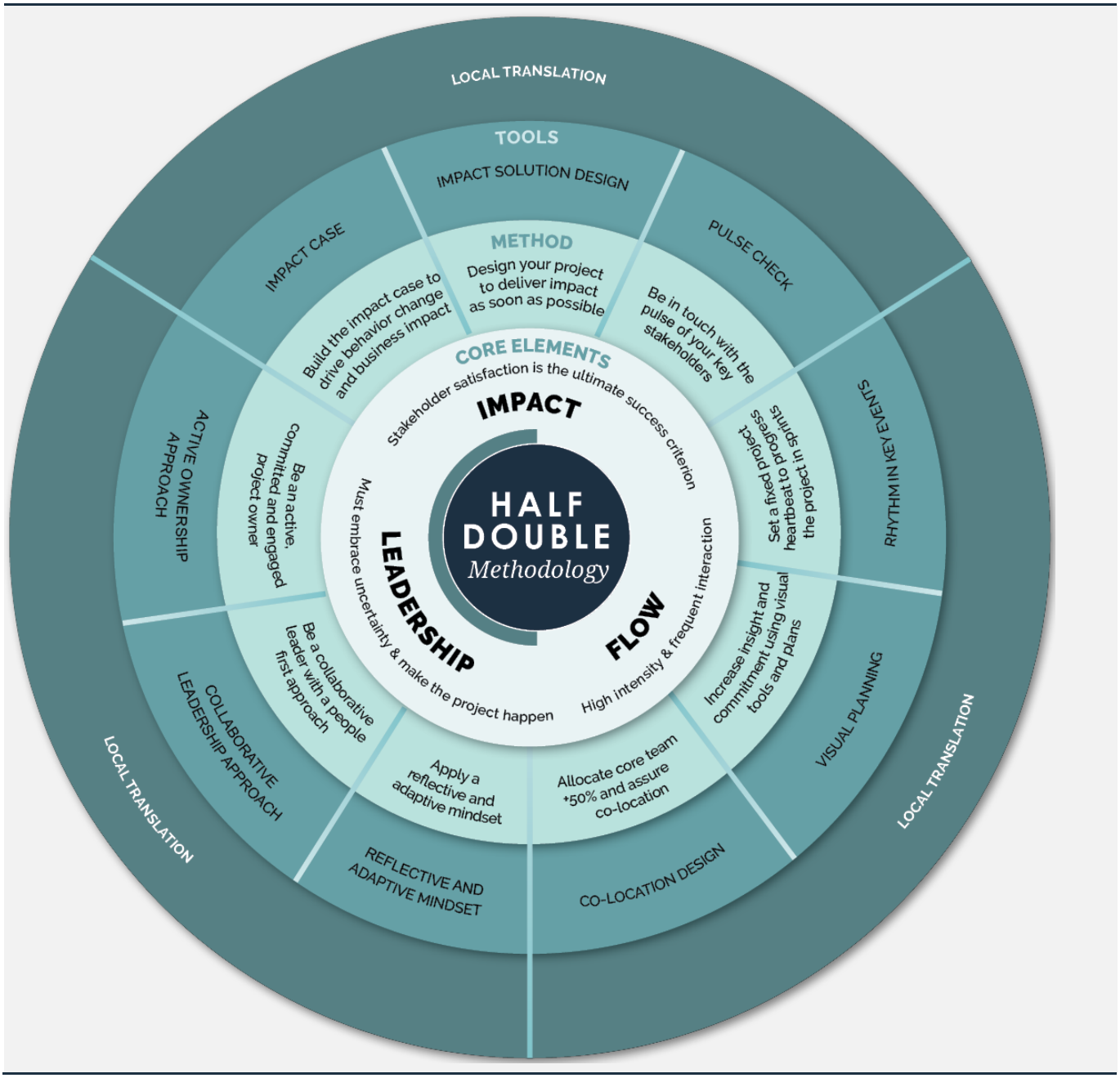


FIGURE 3.1: THE HALF DOUBLE METHODOLOGY

3.1 Core element 1: Impact

Principle: Stakeholder satisfaction is the ultimate success criterion.

No project exists for the sake of the project. All projects are initiated to create impact. Identifying and focusing on impact right from the start is the key. Impact changes the dialog from being centered on technical deliverables to how to ensure stakeholder satisfaction throughout the project's lifecycle. The HDM puts forward the following methods and tools to realize impact in practice:

Impact method 1: Build the impact case to drive behavioral change and business impact.

Projects should be driven by impact rather than deliverables. Together with key stakeholders and subject matter experts, we therefore formulate an impact case that lists, prioritizes and visualizes the business and behavioral impact the project is set out to create. These impacts are broken down into selected Key Performance Indicators (KPIs) to steer the project forward. The impact case and KPIs are used to follow up on project progress continuously adapting plans and efforts to enhance stakeholder satisfaction. **Tool**: Impact Case.

Impact method 2: Design your project to deliver impact as quickly as possible.

We must move away from the premise that projects only generate value at the very end of their lifespan. We need to create early insights through fast prototyping, generating impact – faster in the process. As soon as objectives and key impacts are identified, the project is ideated and analyzed to define the fundamental idea. The fundamental idea summarizes the actual solution design; the approach to realize impact as soon as possible; how to frontload knowledge and involve end users right from the start; and how to capture learning and insights early in the project and throughout its duration. Key insights and learning allow us to adapt the approach to the ever-changing environment and the thoughts and feelings of our key stakeholders. The core idea is the foundation for the impact solution design – an overall map outlining the project's impact realization journey toward its conclusion date, which combines commercial, behavioral and technical deliverables. **Tool:** Impact Solution Design.

Impact method 3: Be in touch with the pulse of your key stakeholders.

Acknowledging and working actively with the dynamic nature of projects are key to success. Interests and focus change rapidly, and it is essential to gain insights and facilitate an ongoing dialog among the right people to ensure engagement and continuous focus on the right impact. As part of the effort to gain that insight, we identify the project's key stakeholders, and once a month we distribute an electronic six-item questionnaire set up to measure the stakeholder's "pulse"; e.g. "Are you confident that your current work is creating impact for the project?" The pulse check report provides a snapshot of each stakeholder's experience with the project. This insight functions as the basis for a constructive dialog regarding how to steer the project forward to leverage impact, ensure energizing working conditions and personal development. **Tool:** Pulse Check.

3.2 Core element 2: Flow

Principle: High intensity and frequent interaction to ensure continuous project progression.

We want to create flow in the project. The whole project group should work on the project at the same time – not just a few project team

members. However, important project working hours are often lost in coordination, retrospective project reporting and shifting between multiple projects running simultaneously. We can do better. To focus on the flow of the project, we use simple methods to intensify project work, ensure the project progress every week and deliver results – faster. The HDM puts forward the following methods and tools to enhance flow in practice:

Flow method 1: Allocate team +50% and ensure co-location.

At a portfolio level there is a best practice approach aimed at ensuring "short and fat" projects – meaning fewer projects with a more intense resource allocation. The approach has been proven to reduce lead-time drastically. Together with the project owner, project leader and portfolio management office, we therefore work to ensure that core project team members are +50% allocated to the project. We furthermore know that placing project team members in the same physical (or virtual) location enhances their team performance as it boosts energy and the degree of knowledge sharing among participants. To ensure effective and efficient project work, we therefore aim at establishing an energizing virtual or physical co-location set up to do away with complexity generated by different time schedules and sites. The collaborative set up is designed as a step-by-step process that supports the fixed project heartbeat and the visual tools. **Tool:** Co-Location Design

Flow method 2: Set a fixed project heartbeat for stakeholder interaction to progress the project in sprints.

A fixed project heartbeat creates more energy, higher efficiency, better quality and ultimately faster development. In short, stringent structures free up energy and the focus needed to do creative thinking and solve complex project tasks. Together with the project leader, we develop a stringent rhythm consisting of monthly sprint planning meetings, weekly 30-minute status meetings and weekly solution feedback meetings where deliverables are presented and evaluated by key users and important stakeholders. Based on solution feedback from users, the following week's deliverables are planned in detail using a visual poster. Every two weeks, the project owner takes part in the review meetings to get to know the project in its raw and unpolished form. "Corporate theater meetings" with neat PowerPoint presentations are reduced to a minimum and time spent is optimized and utilized to handle real life project issues and decisions. Tool: Rhythm in Key Events.

Flow method 3: Increase insight and commitment using visual tools and plans.

When operating in a project mode with high intensity and many touchpoints with both internal and external stakeholders, it is important to find an efficient way of communicating progress and solutions as well as progress and traction. Powerful visualization is an indispensable communication tool that drives dialog and project progress. To enhance commitment and alignment, we therefore ensure that the project core team together produces a visual plan for the overall sprint for ongoing reference at daily and weekly planning sessions and weekly solution feedbacks. All plans are kept visual (or virtual) at all times in the co-location set up; they are also used for quick communication of the status of the project to other stakeholders. We furthermore work with visualizing the current solution or process at hand through mock-ups and fast prototyping using simple drawings, simulations with colored cards and posters. **Tool:** Visual Planning.

3.3 Core element 3: Leadership

Principle: Leadership embraces uncertainty and makes the project happen.

We aspire to revolutionize how projects should be led. We want less bureaucracy, less formal steering committee meetings and less contractual focus. We need less compliance and more commitment. We need leaders who cope with turbulence, conflicts and people – leaders who focus on the human aspects; work closely together on a regular basis; handle issues and complexity jointly and know the project inside out.

Laid-back formal steering committees that critically assess the project only once every two months are a thing the past. Project owner involvement, sparring with the project and intensity are the future. Project owners must dare take the lead and must invest and spend real time on the projects –simply because research has proven an active owner to be a critical prerequisite for project success.

Project leaders who view and promote themselves as the most technically savvy and think that structure can save any project are living in the past. Collaborative project leaders with a people-first approach who can embrace a complex human system are the future – because they actually succeed with their projects.

The HDM puts forward the following methods and tools to enhance project leadership in practice:

Leadership method 1: Be an active, committed and engaged project owner.

Research suggests one common denominator across all successful projects: an active, committed project owner who engages directly with the project on an ongoing basis. We therefore work intensively on ensuring that the right project owner is appointed in close collaboration with the steering committee. The project owner will be working closely together with the project leader and the steering committee to ensure project success. The project owner should focus on eliminating idiosyncrasy at the organizational level to pave the way for the Half Double mindset and to adapt the project to governance or vice versa. Furthermore, the project owner should spend real time on the project – three hours biweekly as a rule of thumb – to embrace uncertainty and adapt to changes with on-the-spot decision-making as the primary tool. Being part of the meetings will ensure continuous focus on impact and guide the overall project to stakeholder satisfaction. **Tool:** Active Ownership Approach.

Leadership method 2: Be a collaborative project leader (not manager) with a people-first approach.

It no longer suffices to be a trained technician who can follow detailed procedures and techniques, prescribed by project management methods and tools, if you are to lead a project to impact. Collaborative project leadership is about leading a complex system of human beings, embracing the inevitable uncertainty and making the project happen. A collaborative project leader is capable of using domain knowledge to provide some of the answers and ask the right questions. At the same time, a collaborative project leader is capable of facilitating a people process with high energy in interaction, to apply knowledge from cross-functional subject matter experts and solve complex project problems in the process. In other words, a collaborative project leader “knows what to do when you don’t know what to do”. We therefore coach our project leaders to reflect in practice and act off the cuff in challenging situations. **Tool:** Collaborative Leadership Approach.

Leadership method 3: Apply a reflective and adaptive mindset.

One of the most important leadership skills is adaptive competency: the ability to react swiftly and intelligently to whatever changes he or she might face; having a personal drive and at the same time the ability to keep an eye on what happens when you act. In order to act swiftly and focused, you need to know who you are. You need to be aware of what you do, why you do it, and be able to read and learn from the consequences of your actions. At the same time, you have to be able to read other people and their reactions. Enabling you to adjust your approach, tap into their underlying motivational drivers and to make them follow you. The reflective and adaptive mindset pinpoints three states of mind that the active project owner and the collaborative project leader should subscribe to in order to leverage their leadership and enable the Half Double approach. **Tool:** Reflective and Adaptive Mindset.

3.4 Local Translation

Principle: Build a Half Double mindset to initiate the Half Double approach.

Current practice will lead to current results and new results require new practices. In other words, implementing Half Double is implementing change. For the change to be a success, we have to establish a Half Double mindset with key stakeholders early in the process. This requires us to assess and rethink our current practice. All too often, the best of intentions are in place going in, but hurdles along the way – in the form of rigid governance structures, misalignment of expectations and lack of real commitment – may result in relapse into old habits and practices.

On the one hand, the organization must adapt to be in alignment with the Half Double mindset. It requires executive level commitment and willingness to think along new lines; abandoning the focus on early predictability in cost and specifications in favor of a focus on impact creation and stakeholder satisfaction; abandoning the idea of placing operational needs and hierarchies before the project instead providing the space and resources needed to ensure high intensity and weekly progression; dismissing contract and quality/time/cost as the only control mechanisms and allow for trust and relationships to be main drivers. And, last but not least, to move away from placing rules and best practice standardized before the needs of the specific project instead allowing for flexibility in governance and execution model to empower people and impact in gate decisions. In sum, the right choices must be made in order to create successful projects.

On the other hand, there is a need for aligning and tailoring the methodology to the situation at hand to organizational structures, cultures and to the local nature of the projects. There is no “one-size-fits-all” and the project, the methods and tools must be designed to fit the conditions of the surroundings.

The HDM puts forward the following methods and tools to ease implementation and ensure a change that sticks in the organization:

Local translation method 1: Build a Half Double mindset to initiate the Half Double approach.

A strong coalition that supports the change must be established. Based on our context, we consider who should support the change in order to make it sustainable. It is among these people that we must create a common mindset and vision right from the start. **Tool:** A Half Double mindset.

Local translation method 2: Customize to governance to ensure flow.

Each project must be customized to the specific governance and local best practice models to succeed. The uniqueness of the project must be handled on a broader organizational level to ensure the freedom to maneuver and progress. At the same time, the local governance and project execution standards are assessed to identify whether there is a fit or whether it would be beneficial to deviate from certain standards to ease progression and realize the impact solution design. Having this dialog in advance is crucial to deliver on the project's Impact Case. **Tool:** Customize to governance.

Local translation method 3: Anchor the HDM practice to pave the way for new results.

Implementation of Half Double is implementation of change. When change is introduced, there will be established habits that are difficult to alter. We therefore initially reflect on what radical changes are needed. Then, on an ongoing basis, we assess our progress in terms of anchoring the new methods and tools with key stakeholders. **Tool:** The reflective map.

4 Evaluating Half Double Projects

By Anna Le Gerstrøm Rode and Anne Jensby (Aarhus University)

This chapter presents the overall evaluation of the first 16 Half Double (HD) projects and organizations participating in phase 1 and phase 2 of Project Half Double (PHD).

The evaluation focuses on the performance and success rate of the HD projects and organizations and compares the overall evaluation results to three external benchmarking standards.

4.1 Evaluating Half Double project success and performance

The following table 4.1 serves as an overview of the evaluation results of the first 16 HD organizations and projects implementing the Half Double Methodology (HDM).

HALF DOUBLE ORGANIZATION	PROJECT TYPE	SUCCESS	PERFORMANCE
SIEMENS	Product Development	Medium	Low
GRUNDFOS	Product Development	Low	Low
Lantmännen Unibake	Business Development	High	High
Coloplast	Supply Chain	High	High
novo nordisk	Information Technology	High	High
Jabra GN	Information Technology	Medium	High
VELUX	Organizational Change	High	High
novozymes	Product Development	Low	Low
SAS	Supply Chain	High	Low
FoodService Danmark	Supply Chain	High	Medium
LINAK	Process Optimization	Medium	High
FIBERLINE	Process Optimization	Medium	Low
TERMA	Supply Chain	High	High
SCHOELLER PLAST	Process Optimization	Medium	Medium
Hydratech	Production Transfer	High	*No data*
LEGO	Process Optimization	High	Medium

Low performance/success rate *Medium performance/success rate* *High performance/success rate*

TABLE 4.1: HALF DOUBLE ORGANIZATIONS AND PROJECT RESULTS

The first two columns to the left show the HD organization and HD project in each case. The last two columns to the right show the results of the evaluation on two indicators.

First, table 4.1 shows the degree to which the HD projects' success criteria are fulfilled – indicating the absolute success rate of each project. These success criteria are specific targets set for the individual HD projects and reflect real business benefits. Hence, the success criteria are not restricted to a set of general evaluation criteria like the typical definition of success following the triple constraints of time, cost and quality. The absolute evaluation is operationalized into three levels:

- High success rate: all or above 67% of the success criteria are fulfilled
- Medium success rate: between 34% and 66% of the success criteria are fulfilled
- Low success rate: none or less than 33% of the success criteria are fulfilled

We have sufficient data to conclude on the success rate of all 16 cases from phase 1 and 2. Overall, the table shows that nine out of 16 (56%) organizations' HD projects have a high success rate. Only in two (13%) cases, HD projects have a low success rate. Five HD projects (31%) have a medium success rate.

Second, table 4.1 shows the degree to which the HD projects outperform the comparative group of reference projects not applying the HDM – indicating the relative performance of each project. The relative evaluation is based on a comparative case study between as similar projects as possible – except for the application of HDM. At least all projects have the same host organization – referred to as the HD organization. The Half Double performance evaluation is based on time and impact: two key performance indicators that are central to the ambition of the HDM: to deliver "Projects in half the time with double the impact" where projects in half the time should be understood as half the time to impact. The relative evaluation is operationalized into three levels:

- Higher performance: the HD project is completed faster and with higher impact than all the comparable reference projects
- Medium performance: the HD project is completed at approximately the same speed and with approximately the same impact compared to the reference projects
- Lower performance: the HD project is completed slower and with lower impact than all the comparable reference projects

We have sufficient data to conclude on 15 out of the 16 cases – lacking data from one organization in which the comparison is not possible.

Overall, table 4.1 shows that in seven (47%) out of 15 organizations, the HD projects have a high performance, in three (20%) cases, the HD projects score medium performance and in five (33%) cases, the HD projects have a lower performance relative to the comparable reference projects.

It is important to keep in mind that the results do not include causal mechanisms. They only point to the HD projects' relative performance and are only capable of answering the question: are the HD projects faster and more impactful than comparable reference projects? In that case, one plausible explanation is the HDM – operationalized as project practices. For further details on the methodology and the limitations behind the study, please see Appendices B and D.

The following figure 4.1 with two pie charts illustrates the proportion of high and low scoring HD projects of phase 1 and 2.

The first pie chart on the left illustrates the degree of fulfillment of success criteria in 16 HD projects employing the HDM. It illustrates that

14 of the 16 projects (87%) have a high or medium success rate, having fulfilled or partly fulfilled their success criteria. The second pie chart to the right illustrates the degree of performance in the 16 HD projects. It illustrates that 10 of the 16 projects (63%) have a high or medium performance compared to their reference project. The performance and success rate of the projects are combined in the matrix shown in figure 4.2, where success rate is on the x-axis, and performance is on the y-axis. The matrix shows that nine (56%) of the 16 projects are green having a medium/high performance and/or success rate. Five of the nine projects are both highly successful and high performing, which is illustrated with a darker

green color. There are four (25%) red projects with a low success rate and/or performance. Two (13%) of these projects are neither successful nor performing, illustrated with dark red. These two projects we label as failed projects – although it is important to note that they may be successful on other parameters excluded in this evaluation. There are two yellow projects: one scores medium both in terms of success rate and performance, and the other has fulfilled most success criteria, but performance is low compared to the reference projects. The colorless project lacks comparable project data as to its relative performance but has most success criteria fulfilled.

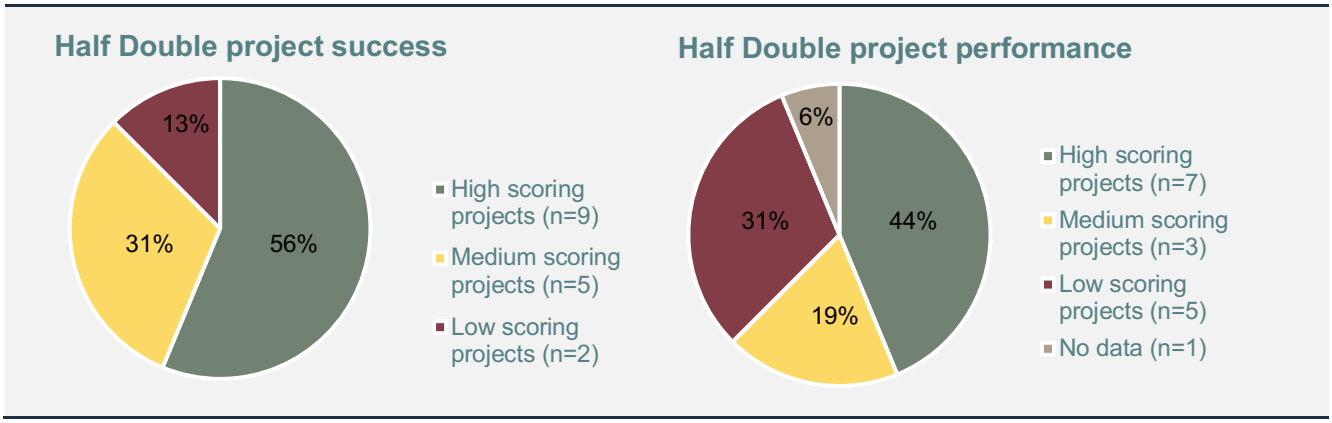
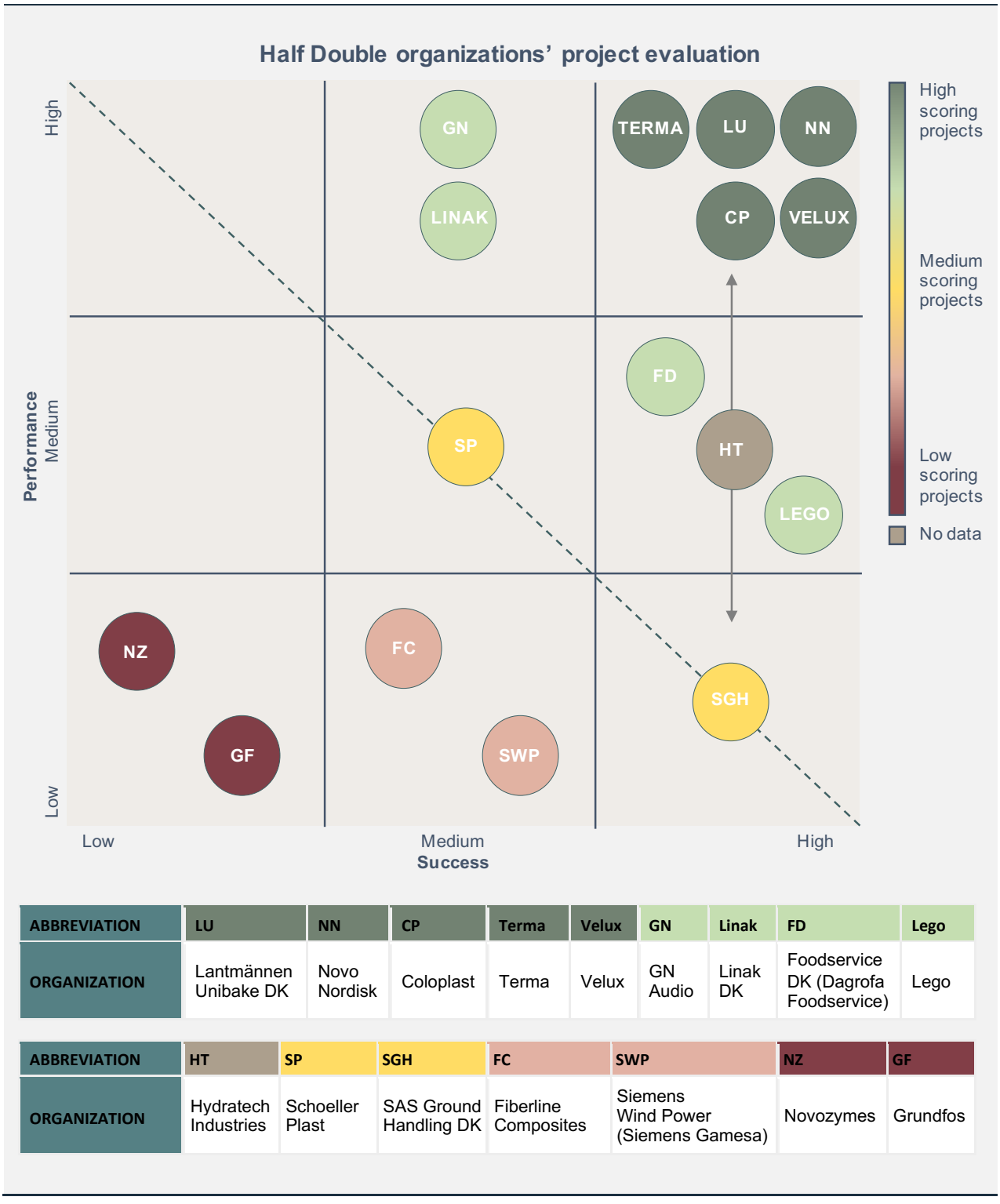


FIGURE 4.1: HALF DOUBLE PROJECT EVALUATION OF SUCCESS AND PERFORMANCE



ABBREVIATION	LU	NN	CP	Terma	Velux	GN	Linak	FD	Lego
ORGANIZATION	Lantmännen Unibake DK	Novo Nordisk	Coloplast	Terma	Velux	GN Audio	Linak DK	Foodservice DK (Dagrofa Foodservice)	Lego

ABBREVIATION	HT	SP	SGH	FC	SWP	NZ	GF
ORGANIZATION	Hydratech Industries	Schoeller Plast	SAS Ground Handling DK	Fiberline Composites	Siemens Wind Power (Siemens Gamesa)	Novozymes	Grundfos

FIGURE 4.2: HALF DOUBLE ORGANIZATIONS' PROJECT EVALUATION

4.2 Benchmarking Half Double project results

To better understand the results of the evaluation, we put them into perspective by benchmarking the evaluation results against three other studies on success/failure rates in projects.

The three benchmarking studies as well as the Half Double (HD) study is shown in Table 4.2.

EVALUATION CRITERIA		IPMA (2019)	PMI (2020)[1]	CHAOS (2018)	PHD (2021)
1	Deliver projects on time	30%	39%-63%	40%	N/A
2	Deliver projects on budget	36%	46%-67%	43-58%	N/A
3	Deliver projects that meet original goal and business intent	44%	56%-77%	26%[2]	56%[5]
4	Deliver stakeholder satisfaction	46%	N/A	32%[3]	88%[6]
5	Project failure	N/A	21%-11%	19%[4]	13%[7]

[1]PMI reports on all evaluation criteria in intervals ranging from low to high organizational maturity level
[2]CHAOS reports on the third evaluation criteria in an interval from precise to close
[3]CHAOS reports on the fourth evaluation criteria in an interval from satisfied to very satisfied
[4]CHAOS reports on the fifth evaluation criteria based on data from 2017
[5]PHD reports on the third evaluation criteria in an interval from 67% to 100% of project success criteria fulfilled
[6]PHD reports on the fourth evaluation criteria as high application of a practice focusing on stakeholder satisfaction
[7]PHD reports on the fifth evaluation criteria in an interval from 0% to 32% of project success criteria fulfilled

TABLE 4.2: BENCHMARKING THE HALF DOUBLE EVALUATION WITH THREE OTHER STUDIES

The first column to the left lists selected measurements across all four evaluations.

The remaining columns show three project and project management evaluations that serve as baselines in this external benchmarking of the above evaluation results presented in this report and shown in the fourth and final column.

IPMA (Sexton, Foley, & Wagner, 2019)

The second column shows the results from the Global Outlook Survey conducted by IPMA in collaboration with KPMG and AIPM (Sexton et al., 2019). The report examines project management performance based on a survey with 476 respondents across 57 countries.

PMI (Project Management Institute, 2020)

The third column shows results from the Pulse of the Profession survey conducted by the Project Management Institute (2020). The report examines project management performance based on survey answers from 3,972 respondents.

CHAOS (Johnson, 2018)

The fourth column shows the results from the CHAOS report published by The Standish Group (Johnson, 2018). The report examines project management performance based on survey data from a database of 50,000 projects and 1,000 organizations collected from 2013 to 2017.

PHD (Rode & Svejvig, 2021)

Finally, the last column to the right shows the results from the evaluation presented above and published in this report. The study is based on absolute and relative evaluations based on qualitative and quantitative data from 19 HD projects and 43 reference projects in 16 organizations amounting to a total of 62 projects.

The four studies are different in terms of their research methods. While the first three benchmarking studies are rather broad and based on statistical analysis from quantitative questionnaires, the PHD study is rather deep and based on mixed methods combining quantitative and qualitative data from interviews, observations, and documents. Each method has its advantages and disadvantages. A further discussion of the methodological differences and similarities across the four studies is outside the scope of this chapter. Notwithstanding these methodological differences, we find it reasonable and relevant to compare the PHD study with the three benchmarking studies in order to put the PHD evaluation into perspective.

The first two rows (measurement 1-2) show data on project management performance in terms of cost and time – which is not a part of the PHD study. The more interesting numbers are the three following rows in (measurement 3-5) which are comparable across the PHD study and two or three of the external benchmarking studies. Each benchmark is explicated in the sections below.

4.2.1 Projects that meet original goal and business intent

In terms of projects' ability to meet the original business intent and goal, two of the external benchmarking studies find that between 26% and 44% of projects are successful while the third report states that it depends on the maturity of the host organization and finds that the success rate ranges from 56% to 77% in low and high maturity organizations.

Compared to these standards, PHD data show a success rate of 56% meaning that more than half of the HD projects have fulfilled all or most of their success criteria. This result is considered in the high end compared to the two lower (26%-44%) scores and in the lower end compared to the maturity range (56%-77%). All in all, the success rate of 56% among the HD projects is neither considered high nor low due to the very broad range from 26% to 77% in the three benchmarking studies.

4.2.2 Projects that deliver stakeholder satisfaction

In terms of stakeholder satisfaction, two of the benchmarking studies evaluate this measurement and find that between 32% and 46% of projects deliver stakeholder satisfaction.

The PHD study does not have a measure that is exactly identical, but it does have data on how various project managers have worked with stakeholder satisfaction in the HD projects. All projects in the PHD study have been rated on of a scale of 1-4 (low/high) on four practices related to stakeholder satisfaction which is the ultimate success criterion in the HDM. The data reveal that 14 (88%) out of 16 HD projects have a high average score (above 2.5) of stakeholder satisfaction practices. Only two (13%) HD projects score low (below 2.5) on average in practices employed to generate stakeholder satisfaction. Compared to the IPMA scorings of 46% (Sexton et al., 2019) and the CHAOS scorings of 32% (Johnson, 2018) the PHD results of 88% are remarkable and positive. It should be noted, though, that the PHD data are not indicative of the actual stakeholder

satisfaction delivered by the project – but the proportion of projects working with stakeholder satisfaction as a focus area.

4.2.3 Projects that fail

In terms of failure, the CHAOS report finds that 19% of projects fail while PMI reports find that it depends on the maturity of the host organization and finds that failure rates range from 21% to 11% in low and high maturity organizations.

Compared to these standards, PHD data show a failure rate of 13% which means that two out of 16 projects fulfill none or few of their success criteria. This result is considered positive in comparison to the CHAOS report finding 6% higher failure rates and the PMI report finding 8% higher failure rates in immature organizations. In mature organizations the failure rate is 2% lower than the PHD failure rate. It should be noted, though, that the operationalization of failure in the PHD report is restricted to success criteria fulfillment whereas the CHAOS report also includes time and cost defining the term as not being able to deliver projects on budget, time and target (traditional measures), or with a satisfactory result (modern measures). It is also noteworthy that the two failed HD projects are only categorized as failures here on the basis of a success criteria evaluation and that the reason behind their low scores reside in a decision to close the projects due to early insight which can be framed as a successful decision in terms of waste reduction.

4.2.4 Learning from benchmarking evaluations

To sum up, the external benchmarking indicates that the results from the PHD evaluation are notable especially in terms of a high degree of focus on delivering stakeholder satisfaction. In general, the failure rate among HD projects is relatively low compared to other studies. In terms of delivering goal and business intent, the 56% success rate of HD projects is neither high nor low due to the broad spectrum of project success ranging from 26% to 77% in other benchmarking studies.

When reading table 5.2 and comparing the four studies, it is important to be aware of the different standards for measuring success and failure. Success is an ambiguous, complex, dynamic and multidimensional concept that is and has for a long time been heavily debated within the literature on projects and project management

(Judgev & Müller, 2005; Rode & Svejvig, 2018; Shenhar, Dvir, Levy, & Maltz, 2001). It may change over the period of the project and beyond its life cycle. Looking at the academic publications on project success, even the definition of success changes over time (Judgev & Müller, 2005). Often empirical studies examine performance and success (Jung Ho, Seung Eun, Jung In, & Tae Wan, 2019; Shao, Müller, & Turner, 2012) by evaluating the extent to which a project achieves a set of predefined success criteria (Haass & Guzman, 2019). Success criteria can relate to project outcomes (Chen, 2015) assessing project effectiveness (P. Crawford & Bryce, 2003): doing the right thing (Zidane & Olsson, 2017) or project processes (Chen, 2015) assessing project management efficiency (P. Crawford & Bryce, 2003): doing things right (Zidane & Olsson, 2017) for instance comprised by the classical iron triangle measuring scope, time and cost (Atkinson, 1999). Other studies see project success as a more subjective term – dependent on who evaluates, what is evaluated, and when it is evaluated. Some even suggest that evaluation of project success is a situated sense-making process and see project evaluations as social and constructed phenomena (McLeod, Doolin, &

MacDonell, 2012). Therefore, the underlying meaning behind the measures in the above benchmarking may vary across the studies and it is important to have these circumstances in mind when reading the comparison. Nevertheless, the comparison does add to the understanding of the PHD evaluation as it is put into a broader perspective by benchmarking it with other independent standards.

5 Characterizing Half Double Methodology Contexts

By Anne Jensby and Anna Le Gerstrøm Rode (Aarhus University)

This chapter characterizes the contextual similarities between the highest and lowest scoring Half Double (HD) projects identified in the overall evaluation presented in chapter 4.

The HD project evaluations of phase 1 and 2 show that nine (56%) of the 16 projects applying the Half Double Methodology (HDM) score medium/high on performance and success while four (25%) of the HD projects score medium/low on success and performance compared to the comparable projects not using the HDM.

This chapter aims to answer the question "why" by looking at the characteristics of the highest and lowest scoring HD projects.

The analysis is based on pattern matching between these two extreme groups of nine high scoring and four low scoring projects and largely disregards the rest of the medium projects scoring projects and the one project with insufficient data. Hence, as such, the analysis is a comparative case study based on patterns in the data, and not statistical analysis with calculated confidence interval and significance.

5.1 Half Double Methodology sweet spots

We label the project characteristics and contextual factors that are similar for the best HD projects the Half Double sweet spots – which is a term borrowed from sports in which it refers to the area around the center of a bat that is the most effective part with which to hit a ball. In research, it is defined *"as an element of, or an approach to, a change intervention that quickly delivers an effect..."* (Gregor, Imran, & Turner, 2014, p. 656). In this analysis, the Half Double sweet spots mean projects and contexts in which the HDM seems to work especially well and be most effectful.

The analysis draws on the overall evaluation presented in the former chapter 4 where each HD project is evaluated with a high, medium or low (red/yellow/green) score based on the two evaluation dimensions: absolute success rate and relative performance comprised of impact and speed compared to the reference projects not applying the HDM.

The analysis is divided into six sub-sections – including two organizational characteristics (host organization size and industry) as well as three project characteristics (type, duration, size) and a final section on the four project dimensions identified by the diamond of innovation: novelty, technology, pace (Shenhar & Dvir, 2007) and complexity which is further operationalized by the three project management complexity dimensions (Fangel, 2005).

5.1.1 Host organization size

Concerning the projects' host organizations, figure 5.1 shows the three size categories in which we are able to classify the 16 organizations. 12 organizations are large, three are medium, and one organization is small. It is difficult to conclude on the few HD projects in the small and medium enterprises (SMEs) because they are distributed evenly across the four scoring categories with one project in each (green, yellow, red, and grey) category. A clearer picture can be derived from the 12 projects from large organizations. Eight (67%) of the 12 large organizations have green high scoring projects and of the nine high scoring projects, eight (89%) are green. This predominance of high/green projects in large organizations indicates that the HDM

works well in large organizations. It is difficult to derive an indication of the fit between the HDM and small and medium organizations as the data from this segment are restricted to one small and three medium organizations.

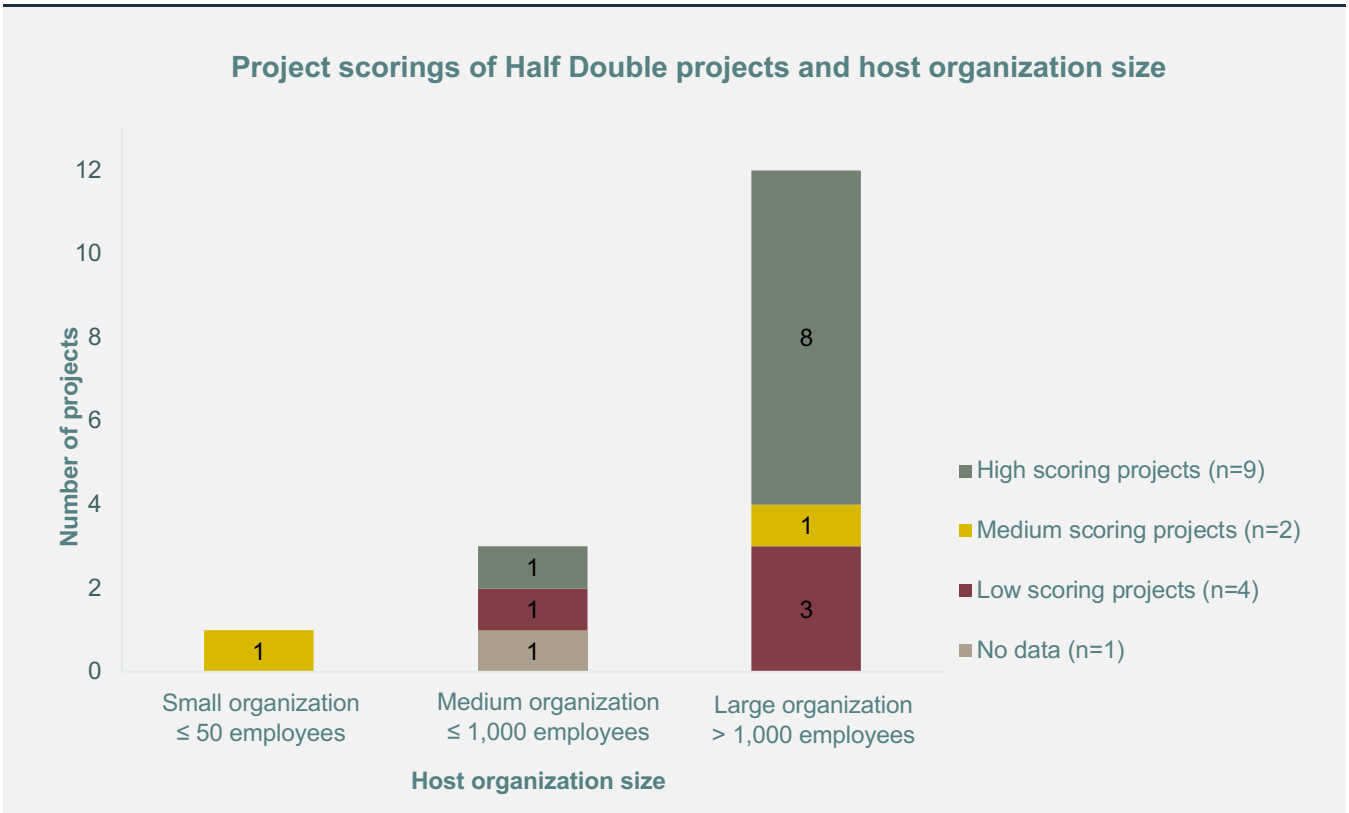


FIGURE 5.1: PROJECT SCORINGS OF HALF DOUBLE PROJECTS AND HOST ORGANIZATION SIZE

5.1.2 Host organization industry

The 16 HD organizations can also be classified into eight different industries. One of these industries; engineering, is only represented (100%) by red low scoring projects – indicating that the HDM has difficult odds within this context. On the other hand, four industries; manufacturing, healthcare, food, and electronics, are only represented (100%) in the green high scoring project group with two organizations in each industry. Altogether, the nine green Half Double projects are located within five industries. Thus, the data in figure 5.2 suggest that the HDM works well within a variety of different industries – but faces difficulties in engineering contexts. This indication should, however, be interpreted with caution as data within this industry are restricted to large engineering projects and it might be that the HDM works well within smaller non-engineering projects within the engineering industry.

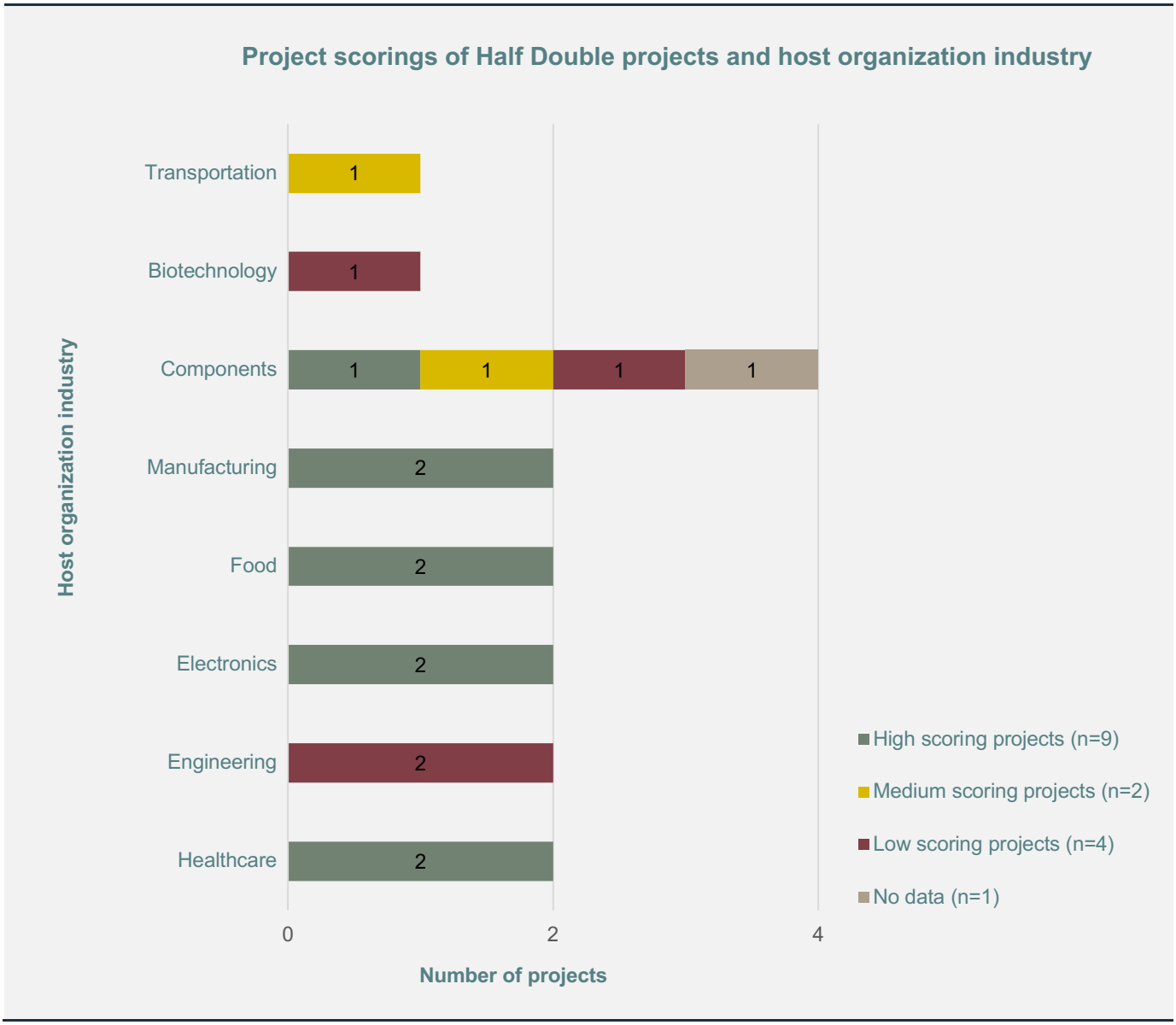


FIGURE 5.2: PROJECT SCORINGS OF HALF DOUBLE PROJECTS AND HOST ORGANIZATION INDUSTRY

5.1.3 Project type

Concerning project type, figure 5.3 shows the seven project types that are represented in the data. All three (100%) product development projects are red and of the four red projects, three (75%) are product development projects – indicating that the HDM is less beneficial for this type of project. On the other hand, of the four supply chain projects, three (75%) are green high scoring projects and one is yellow (medium scoring). All four projects have a high success rate, while two projects score high on performance, one project scores medium, and the last project scores low on performance. Besides the supply chain category, we identify green high scoring projects in a variety of other project types such as business development, information technology, and organizational change.

Thus, the data suggest that the HDM works well within a variety of different project types and especially supply chain projects – but faces difficulties in product development projects.

FIGURE 5.3: PROJECT SCORINGS OF HALF DOUBLE PROJECTS AND PROJECT TYPE

5.1.4 Project duration

Project size is operationalized into the three project duration categories shown in figure 5.4. Small projects are shorter than 250 days; medium projects are between 250 and 500 days; and large projects are more than 500 days from start to closure. Of the 16 Half Double projects, we find that five (71%) of seven short projects are green high scoring

projects and of the nine green high scoring projects, five (56%) are short projects. At the other end of the scale, two (50%) of the four red projects are long projects with a duration of more than 500 days. If we examine the five dark green projects, which both have a high performance and a high success rate, four (80%) have a duration of less than 430 days. Eight out of nine of successful and/or high performing green projects have a duration of less than 500 days. Thus, the data suggest that the HDM works well in projects shorter than 500 days.

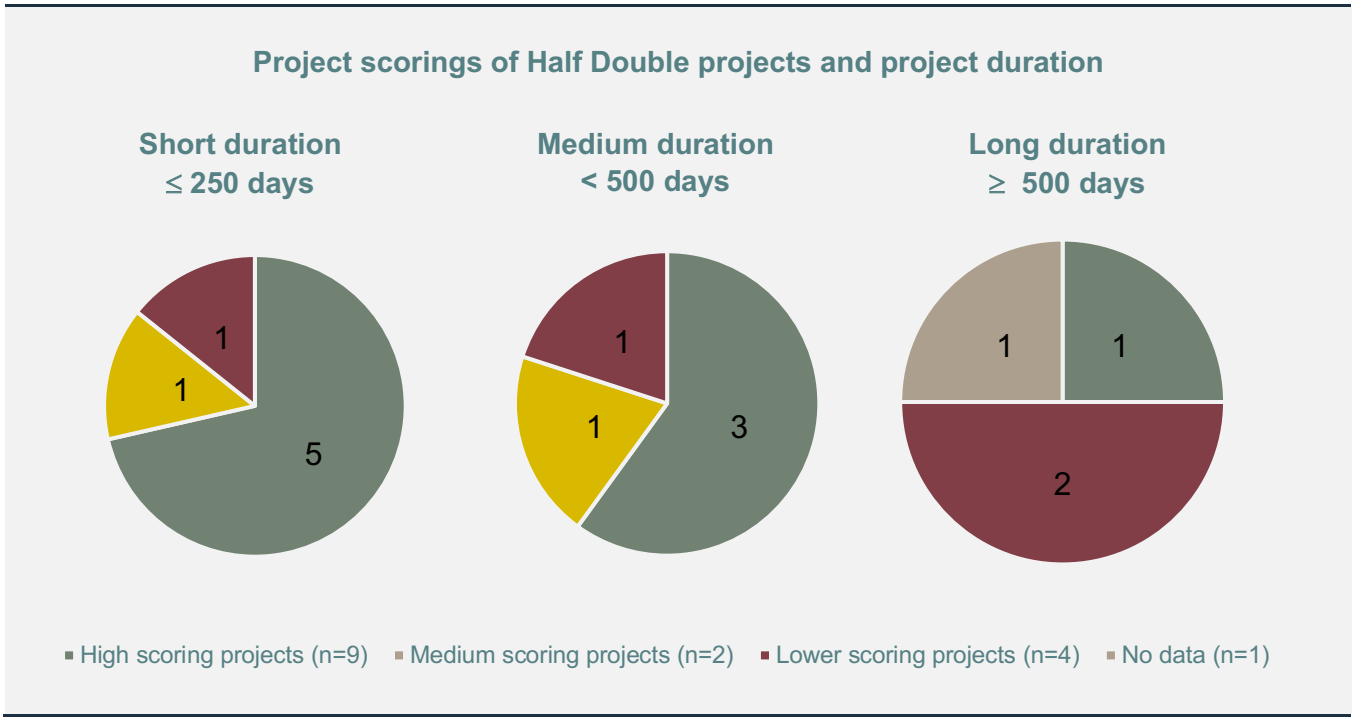


FIGURE 5.4: PROJECT SCORINGS OF HALF DOUBLE PROJECTS AND PROJECT DURATION

5.1.5 Project investment

Project size is also operationalized into the three project investment categories shown in figure 5.5. Small projects cost less than DKK 5,000,000; medium projects cost between DKK 5,000,000 and 10,000,000; and large projects cost more than DKK 10,000,000. There is sufficient data on investments in 13 projects, but as there is only performance data on two medium projects and three large projects, it is not possible to elicit indicators of the HDM in medium and high investment projects. There is one red project in each of the three investment categories, and one to five green projects in each of the categories. Five (63%) out of eight green projects are small and of the seven small projects, five (71%) are green. Thus, the data suggest that the HDM works well in small project

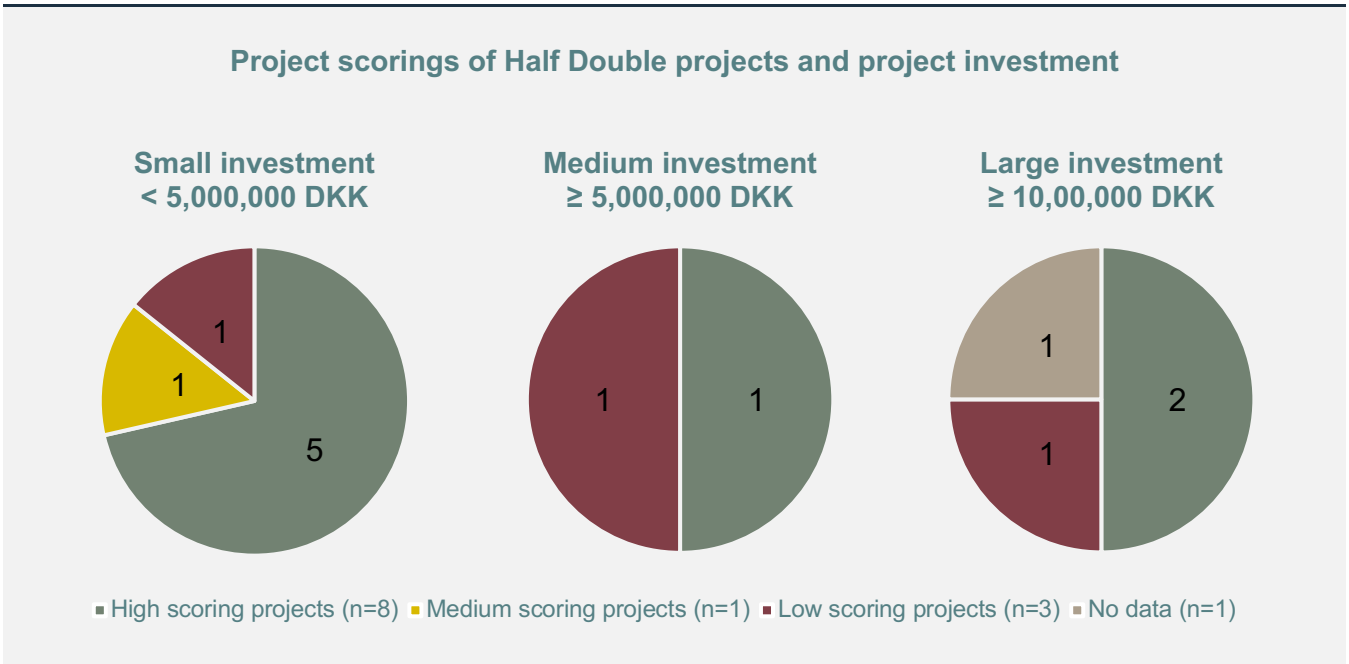


FIGURE 5.5: PROJECT SCORINGS OF HALF DOUBLE PROJECTS AND PROJECT INVESTMENT

5.1.6 Project novelty, complexity, technology and pace

All projects are evaluated based on the diamond model and scored in terms of the four dimensions: novelty, technology, pace (Shenhar & Dvir, 2007) and complexity (Fangel, 2005). The distribution of red, yellow and green scoring projects on these four dimensions are shown in the four individual bar charts in figure 5.6. None of these four dimensions reveal a clear pattern or picture of a sweet spot for the HDM: the red projects have several characteristics, but especially the green projects are distributed across both ends of the four continua. The key takeaway from this evaluation is that the HDM is implemented not in a specific type of project but in a broad variety of projects which for the most part are successful and high performing. The complete distribution of all projects on each characteristic is described in detail in the next four sections.

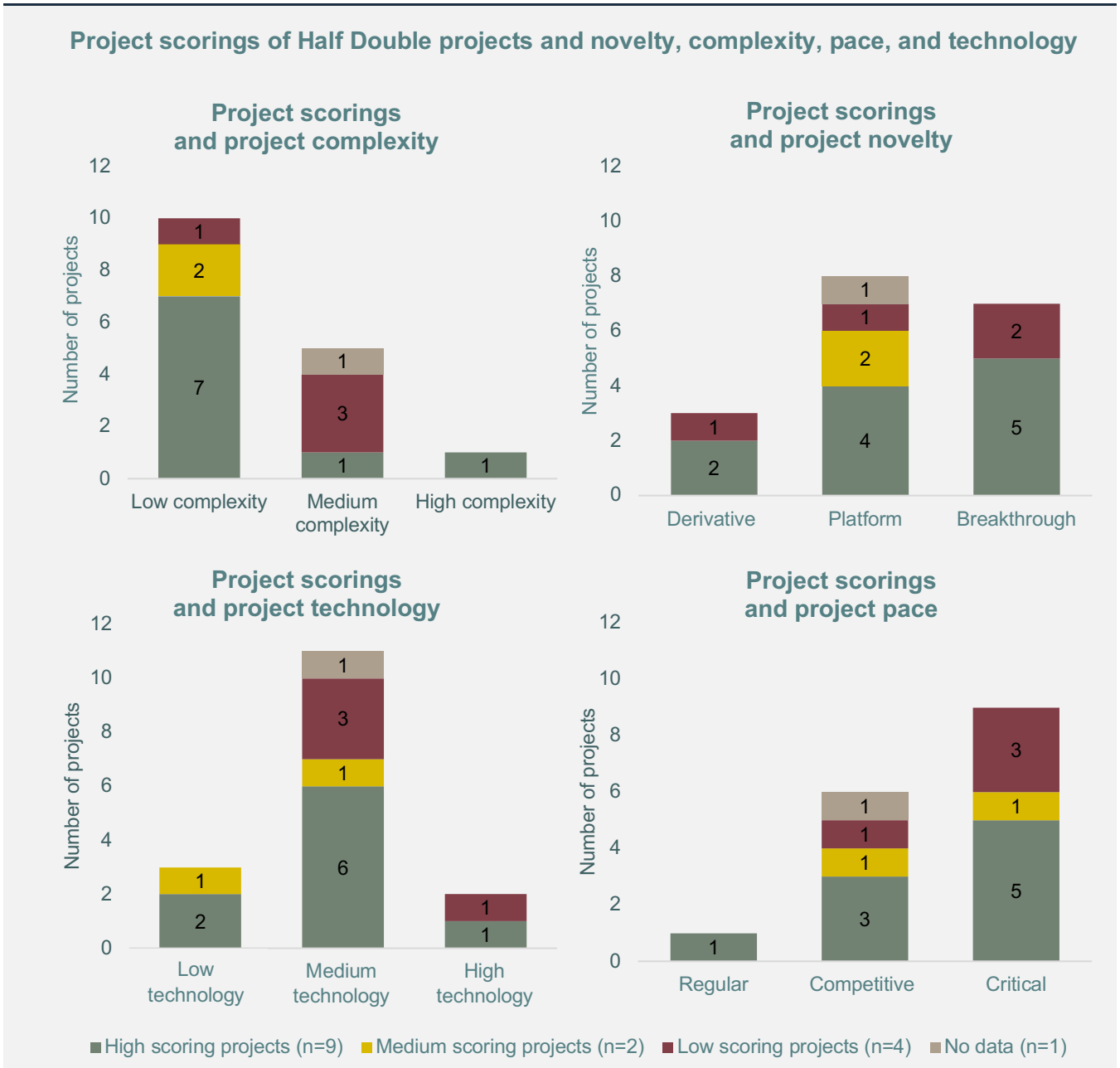


FIGURE 5.6: PROJECT SCORINGS OF HALF DOUBLE PROJECTS AND PROJECT NOVELTY, COMPLEXITY, PACE, AND TECHNOLOGY

Project novelty

Project novelty relates to the newness of the project's given output and can be categorized as derivative (low), platform (medium) or breakthrough (high) projects (Shenhar & Dvir, 2007). We find that four of the eight projects scoring medium on novelty are green projects and two are yellow. Two out of three projects scoring low on novelty are green. Examining red low scoring projects, two out of the four red projects score high on novelty. Thus, there is a slight indication in the data that the HDM works well in medium scoring platform projects that develop new product/service generations to new/existing markets. But as both green

and red projects are represented and almost evenly distributed in all three novelty categories, it blurs the sweet spot picture.

Project complexity

Project complexity concerns the project's environment, tasks, processes, resources, and organization and is an aggregate score based on three dimensions (Fangel, 2005). We find that seven out of the nine green projects have a low degree of complexity. Of the 10 projects that score low on complexity, seven are green – indicating that he HDM seems to work well in projects with low complexity. At the other end of the scale, three of the four red projects have a high degree of complexity – indicating that the HDM faces difficulties in very complex projects. However, the two projects with the highest complexity scores are dark green projects, blurring the sweet spot picture of complexity.

Project technology

Project technology is based on technological uncertainty at project initiation and whether or not the project depends on mature or new technologies (Shenhar & Dvir, 2007). As for technology, two of the three projects being defined as low tech are green, which makes a slight indication that the HDM seems to work well in low tech projects. However, both green and red scoring projects have similar technology levels which blurs the sweet spot picture of technology.

Project pace

Project pace relates to urgency of the project's delivery which can be regular (low), competitive (medium), or critical (high) (Shenhar & Dvir, 2007). Looking at project pace, green projects score both high, medium and low, but the biggest proportion (five out of nine) score high. However, also the biggest proportion (three out of four) of red projects score high on project pace. Thus, it is not possible to see a clear pattern but only a blurry picture of HDM sweet spot in terms of pace.

5.1.7 Defining Half Double sweet spots

Based on the above analysis of the 16 projects from phase 1 and 2, it is evident that the HDM is implemented in many different types of organizations and projects. The majority of these projects are high performing and successful projects – indicating that the HDM seems to work well across a variety of contexts. To be more specific, patterns in the data seem to suggest a HDM sweet spot in large organizations across different industries including healthcare, electronics, food, and manufacturing and in small and short projects of various types but especially supply chain projects.

In total, five of the 16 projects are dark green and score high both in terms of performance and success. Looking at these projects alone, they are from large organizations in industries of healthcare, food, electronics or manufacturing. They are projects concerning supply chains, organizational change, IT and business development. They cover costs from DKK 750,000 to DKK 40,000,000 and have a duration of approximately 100 to 430 days. Lastly, the majority of these are platform projects of medium technology and complexity with a fast/competitive or time-critical pace.

5.2 Learning from failure

Success and failure evaluations can hold interesting and relevant information for project decision makers. However, the success/failure distinction is often incomplete and it only gives a partial picture of the project's process and outcome. Success/failure evaluations are always directed toward some sort of evaluation criteria while omitting other aspects (McLeod et al., 2012). In general, the success/failure dichotomy is limited in terms of

answering questions regarding the subtle learnings in and from each project. Every project –no matter its performance and success rate- constitutes a learning opportunity. *"For instance, a project can be a good failure when the original mission is failed, but the project enables learning that leads to success in future projects."* (Lehtonen & Martinsuo, 2006, p. 6). Hence, failure is a great opportunity for deriving valuable learning of vital importance (Desai, 2015). Therefore, in this last section we turn to the four red low scoring projects and examine them in detail with the aim of generating valuable lessons learned with relevance for PHD stakeholders in general.

In total, two of the 16 projects are dark red and classified as failures, as they score low both on success and performance. In one of these projects, the implementation of the HDM was subject to several delays and resistance, and the methodology was implemented relatively late – suggesting that it is important to implement the methodology early in the project life cycle. Furthermore, the project was one of the first Half Double projects from phase 1 – indicating a HDM front-loading process that introduces the HDM as a minimum viable product that can and has been adjusted and improved since then.

Two other projects are classified as light red, as they have a medium success rate and perform relatively low. One of these projects was the first Half Double project from phase 1 – again indicating the front-loading process of PHD. Furthermore, the HDM was not introduced in the project initiation phase but added the following year – again indicating the importance of agreement on the project methodology early in the project life cycle. The other project was executed later in the second phase of PHD when the HDM was more mature and the methodology was implemented early in the project life cycle – pointing in the opposite direction than the other low scoring projects. In this project, the manager explains that the HDM worked and that the reason the project scores low resides in defects in the material from the supplier. He states that the HDM identified and facilitated the change needed to achieve impact, which became a key learning for the organization, and consequently the methodology was perceived a success within the company notwithstanding the evaluation presented in this report.

Reasons for the relatively low scores in the four red projects can be many. We learn that it probably matters when the methodology is introduced – for two reasons. First, the data indicate that the methodology does not work well when it is introduced late in the project life cycle – suggesting that it is important to agree on the project management methodology early in the project life cycle. Second, the data indicate that the HDM was introduced as a minimum viable product that can and has been adjusted and improved along the way as important learnings were integrated into the concept itself. Notwithstanding, it is important to mention that two of the red projects are evaluated as failures because they are closed as a results of early insight – and that this decision can in itself be seen as a successful attempt to reduce waste. Moreover, some of these red HD organizations express enthusiasm and positive experiences with the methodology, for instance claiming that it has increased their focus on impact or flow, which is a mindset contributing positively to other projects in the organizations. Evaluations going more systematically and thoroughly into depth with these cases of failure constitute an interesting avenue for future research.

6 Comparing Half Double Methodology Practices

By Pernille Nørgaard Boris, Camilla Kølsen Petersen and Per Svejvig (Aarhus University)

The aim of this chapter is to analyze whether the Half Double (HD) projects actually apply the Half Double Methodology (HDM) and document whether the introduction of the HDM in a project also yields higher usage of the HDM practices.

As described in the storyline of Project Half Double (PHD) in chapter 2, a set of practices was developed as a part of an initiative to rethink project management (Svejvig & Grex, 2016), which today is a part of the HDM and referred to as the HDM practices.

In this context, a practice is understood as "a set of socially defined ways of doing things in a specific domain: a set of common approaches and shared standards that create a basis for action, problem solving, performance and accountability" (Wenger, McDermott, & Snyder, 2002, p. 38).

As described in the presentation of the HDM in chapter 3, the HDM practices include three core principles which each have three associated practices amounting to a total of nine different HDM practices.

All projects in PHD are evaluated in terms of their project management practices and scored on a scale from zero to four for each of the HDM practices.

The analysis is undertaken by comparing the usage of HDM practices in the HD projects applying the HDM with the reference projects not applying the methodology. The projects analyzed count in total 68 projects, where 22 are HD projects and 46 are comparable reference projects. These reference projects are typically done and terminated when the HDM is introduced in the case organization, and hence, the pool of reference projects can be seen as a kind of "normal practice" indicative of "business as usual" in these 16 organizations.

As previously stated, the aim of this chapter is to analyze whether the HD projects actually apply the HDM and document whether the introduction of the HDM in a project also yields higher usage of the HDM practices. To fulfill this aim, HD projects are statistically compared to reference projects in terms of usage of the HDM practices. The reasoning behind the comparison between HD projects and reference projects is that the HDM combines different practices from different project management fields, i.e. a HDM practice may be used within an organization even though the project has not implemented the HDM, as the HDM is a combination of different existing practices and mindsets (Svejvig & Grex, 2016).

The research design used in this type of analysis requires setting up a hypothesis which will be confirmed or rejected based on the statistical analysis. The hypothesis explored in this analysis is that HD projects (i.e., implementing the HDM) also will use the HDM practices more intensively than reference projects (i.e., not implementing the HDM). This hypothesis will be tested through comparison of mean values for HD projects and reference projects.

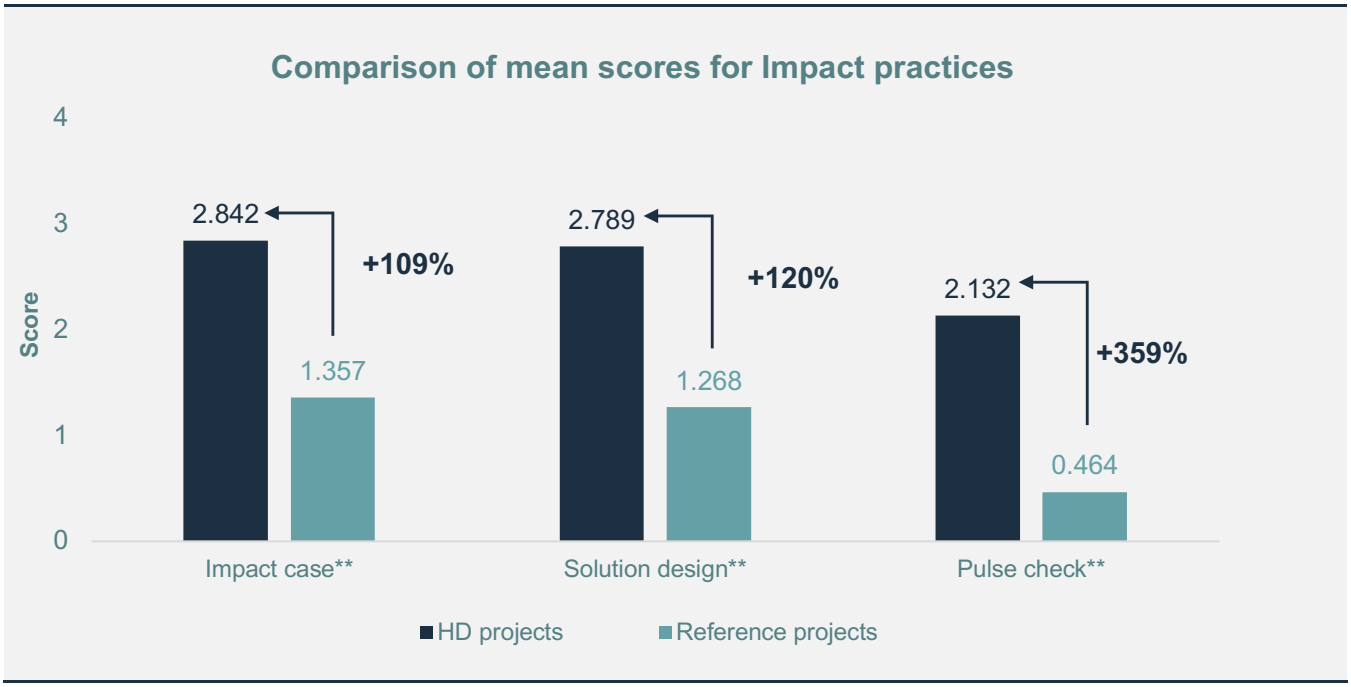
The analysis explores not only if, but also which HDM practices are more often used in HD projects compared to reference projects, and whether any of these potential practice differences are significant.

In the following sections, each of the three core principles are analyzed with respect to confirming or rejecting the hypothesis that projects implementing the HDM (i.e., HD projects) more intensively use the HDM practices, than projects not implementing the HDM (i.e., reference projects).

6.1 Impact practices

The core principle Impact aims to reduce the focus on deliverables and enhance focus on effect. The data reveals that HD projects using the practices i) Pulse Check, ii) Impact Case, and iii) Impact Solution Design score significantly higher on usage of these practices compared to reference projects.

The mean scores for the Impact practices are visualized in figure 6.1.



*** indicates that the difference in mean values for HD projects and reference projects are significant at a level of 99% ($\alpha = 0.01$).*

FIGURE 6.1: COMPARISON OF MEAN SCORES FOR IMPACT PRACTICES

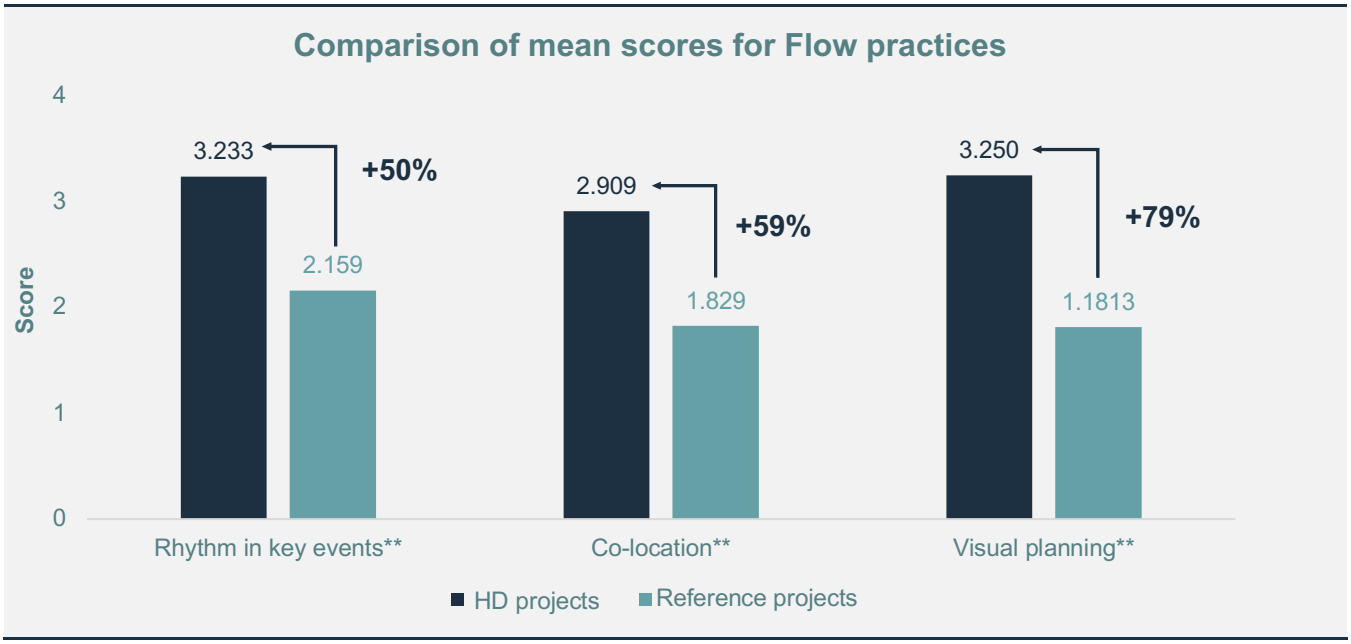
Figure 6.1 shows that all three impact practice scores are significantly higher for the HD projects than for the pool of reference projects representing normal practice.

The figure also shows the percentage difference between HD projects and reference projects for each of the three practices within the impact principle. The figure shows that HD projects on average score 359% higher than reference projects on the practice of Pulse Check. The corresponding difference is 109% and 120% higher on the practices Impact Case and Impact Solution Design correspondently. It is interesting to note that Pulse Check is used markedly less in the reference projects compared to the use of Impact Case and Impact Solution Design implying that it is not normal practice to systematically keep track of the satisfaction and progress perception among core members of the project team.

6.2 Flow practices

The core principle Flow aims to reduce the focus on utilization rate and enhance focus on the project's progression. The data reveal that HD projects using the practices i) Co-Location, ii) Visual Planning, and iii) Rhythm in Key Events score significantly higher compared to reference projects.

The mean scores for the Flow practices are visualized in Figure 6.2.



*** indicates that the difference in mean values for HD projects and reference projects are significant at a level of 99% (α = 0.01).*

FIGURE 6.2: COMPARISON OF MEAN SCORES FOR FLOW PRACTICES

Figure 6.2 shows the percentage difference between HD projects and reference projects for each of the three practices within the Flow principle.

The figure shows that the Flow practices' scores are significantly higher for the HD projects than for the reference projects representing business as usual. Interestingly, Rhythm in Key Events is used with relatively high intensity in both HD projects and reference projects, which may be a sign of agile practices becoming part of business as usual.

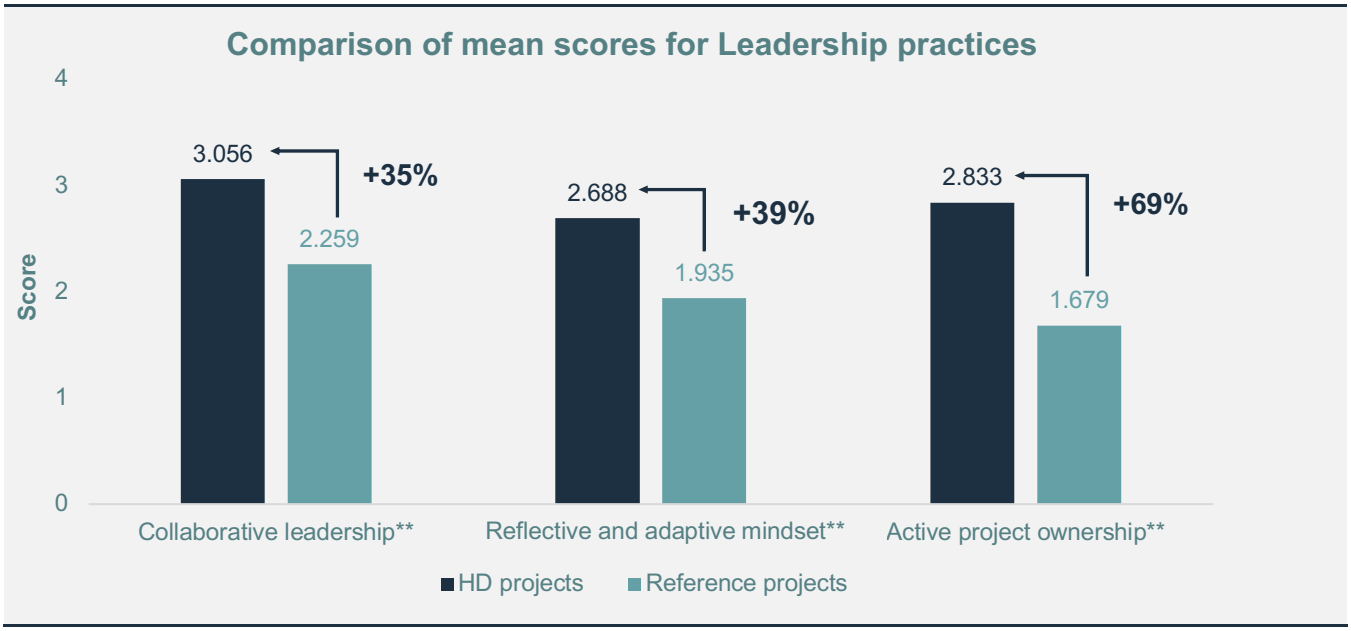
The figure also shows that HD projects on average score 79% higher than reference projects on Visual Planning, where the same number is 59% and 50% on the practices of Co-Location and Rhythm in Key Events correspondently. The numbers indicate that the reference projects to some extend apply the HDM practices, but it also indicates that the introduction of the HDM significantly raises the intensity of the usage of all Flow practices, where the relative increase is the highest for the practice Visual Planning.

6.3 Leadership practices

The core principle Leadership aims to reduce formalism and enhance the focus on active involvement of the project owner and reduce the focus on management of systems and

enhance the focus on Leadership of people. The data reveal that HD projects using the practices i) Collaborative Leadership, and ii) Reflective and Adaptive Mindset, and iii) Active Project Ownership score significantly higher compared to reference projects.

The mean scores for the Leadership practices are visualized in Figure 6.3.



*** indicates that the difference in mean values for HD projects and reference projects are significant at a level of 99% ($\alpha = 0.01$).*

FIGURE 6.3: COMPARISON OF MEAN SCORES FOR LEADERSHIP PRACTICES

Figure 6.3 shows that the usage of the Leadership practices of Collaborative Leadership, Reflective and Adaptive Mindset, and Active Project Ownership are significantly higher for the HD projects than for the reference projects representing business as usual – although with a varying confidence level.

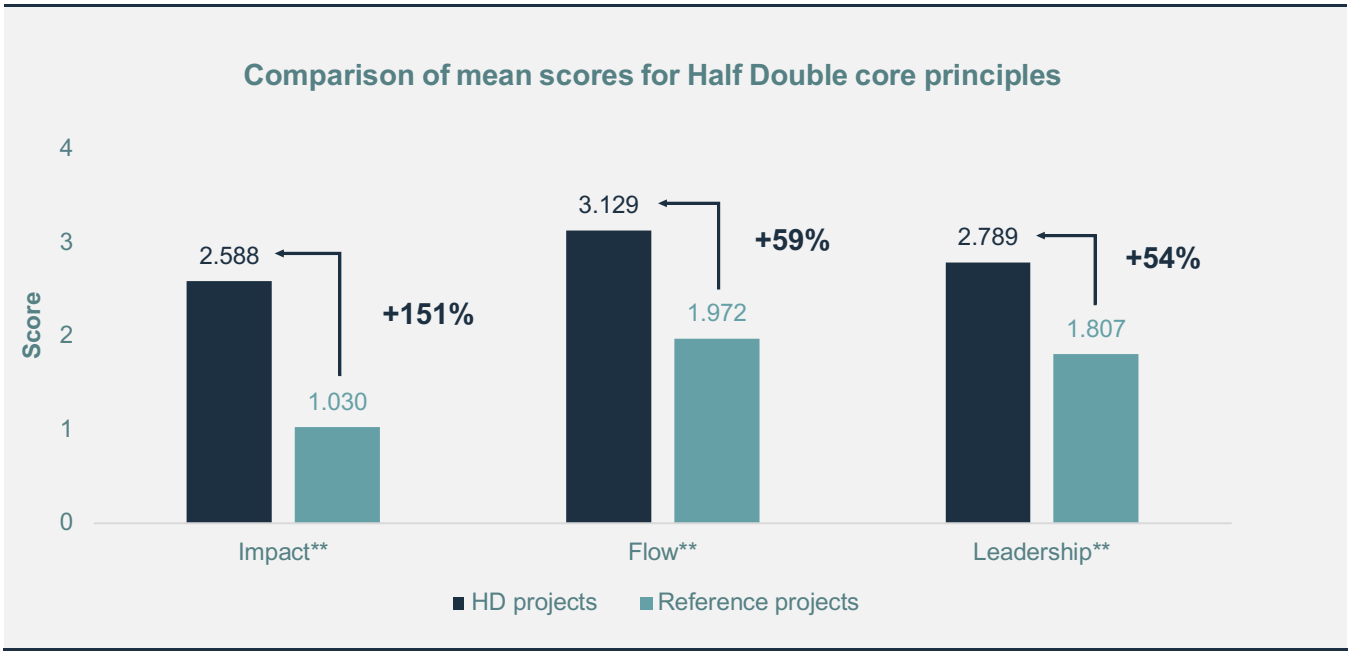
The figure also shows the percentage difference between HD projects and reference projects for each of the three practices within the leadership principle. The figure shows that HD projects on average score 69% higher than reference projects on Active Project Ownership, where the same number is 39% and 35% on the practices Reflective and Adaptive Mindset and Collaborative Leadership correspondently. Compared to the other two principles, the Leadership practice differences are smaller and less significant, which may indicate that leadership practice as usual is closer to the HDM than impact and flow practice as usual.

6.4 Three core principles

The mean scores for HD projects and reference projects on the three core principles in the HDM are summarized in figure 6.4.

The data reveals that there is a significant difference between the usages of the HDM practices related to each of the three core principles when comparing HD projects to normal practice represented by the pool of

reference projects. This was also expected, and it underlines the difference between applying the HDM and practicing "business as usual".



*** indicates that the difference in mean values for HD projects and reference projects are significant at a level of 99% (α = 0.01).*

FIGURE 6.4: COMPARISON OF MEAN VALUES FOR THE THREE HALF DOUBLE CORE PRINCIPLES

The largest difference between HD projects and reference projects is found when looking at the core principle Impact, where the second-largest difference is for the core principle Flow closely followed by the core principle Leadership, which is shown in table 6.1.

CORE PRINCIPLE	MEAN OF HDPS' MEAN SCORE	MEAN OF RPS' MEAN SCORE	SIGNIFICANT DIFFERENCE (UNCERTAINTY LEVEL)	% DIFF HDP/RP
Impact	2,59 (n=19)	1,03 (n=28)	Yes (1%)	151%
Flow	3,13 (n=22)	1,97 (n=41)	Yes (1%)	59%
Leadership	2,79 (n=19)	1,81 (n=32)	Yes (1%)	54%

The mean of the mean score is found by taking the average of the projects' average usage of the core principle (found by the average of the three corresponding practices per project).

TABLE 6.1: COMPARISON OF MEAN OF MEAN SCORES FOR THE THREE HALF DOUBLE PRINCIPLES

Table 6.1 provides an overview of the mean of the mean scores for HDM core principles sorted based on percentage difference between HD projects and reference projects with reference projects as basis. The overview suggests that the HDM differs most from normal practice in terms of its extensive focus on Impact and least when it comes to Leadership. It should be noticed that the leadership practice Active Project Ownership

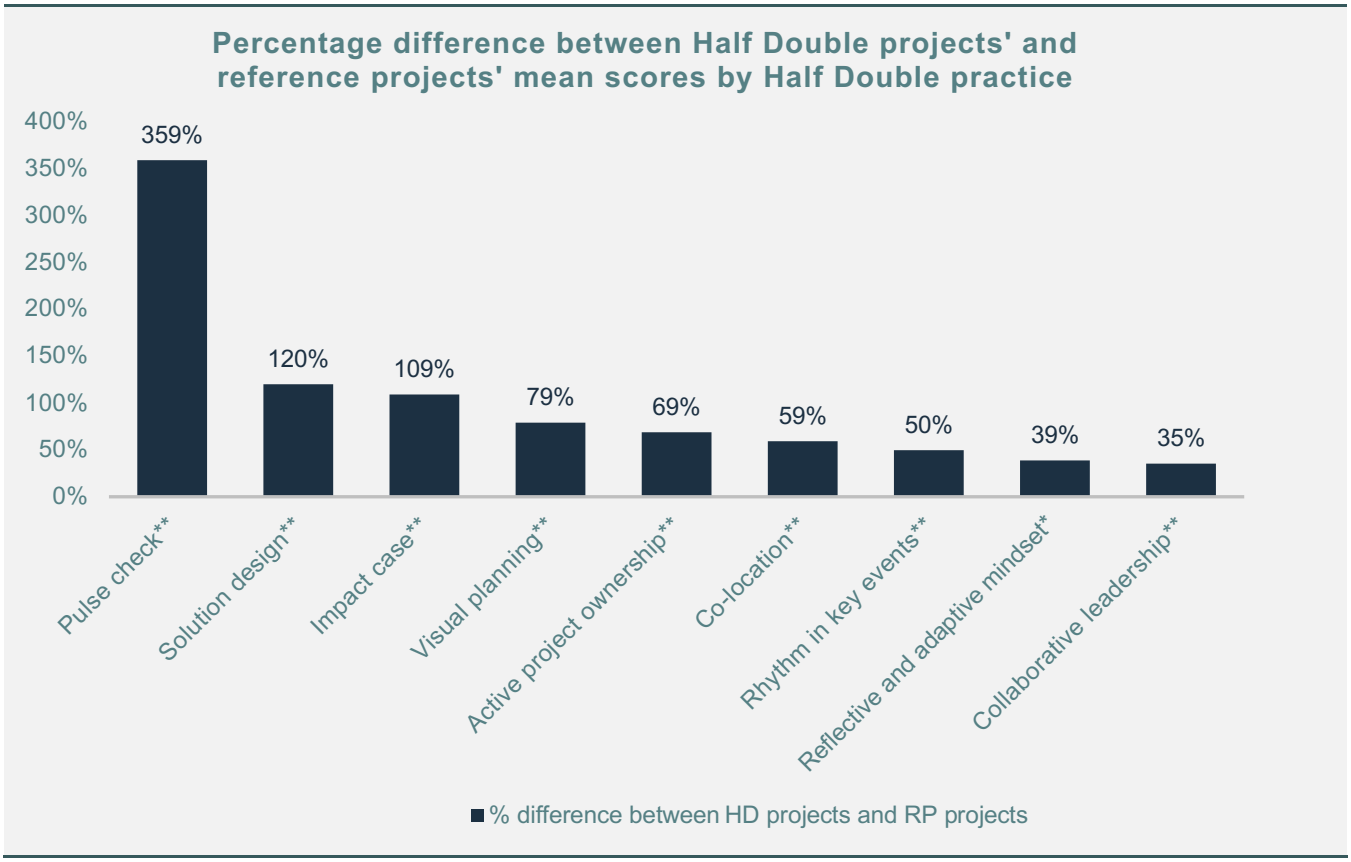
is an important Leadership practice, which is also visible in Table 6.2, where Active Project Ownership is placed on the fifth place of all HDM practices. This is likely to be a result of Active Project Ownership often being a critical factor for project success.

This is a result of the Impact practices i) Pulse Check, ii) Impact Solution Design and iii) Impact Case all yielding the highest difference in score when comparing HD projects and reference projects.

The difference in percentage between HD projects and reference projects on a practice level is visualized in figure 6.5 and listed in table 6.2 which show the mean score and the percentage difference between HD projects and reference projects for each practice sorted by percentage difference between HD projects and reference projects.

CORE PRINCIPLE	PRACTICE	MEAN OF HDPS' MEAN SCORE	MEAN OF RPS' MEAN SCORE	SIGNIFICANT DIFFERENCE (UNCERTAINTY LEVEL)	% DIFF HDP/RP
Impact	Pulse Check	2,13 (n=19)	0,46 (n=28)	Yes (1%)	359%
Impact	Solution Design	2,79 (n=19)	1,27 (n=28)	Yes (1%)	120%
Impact	Impact Case	2,84 (n=19)	1,36 (n=28)	Yes (1%)	109%
Flow	Visual Planning	3,25 (n=22)	1,81 (n=40)	Yes (1%)	79%
Leadership	Active Project Ownership	2,83 (n=18)	1,68 (n=28)	Yes (1%)	69%
Flow	Co-Location	2,91 (n=22)	1,83 (n=38)	Yes (1%)	59%
Flow	Rhythm in Key Events	3,23 (n=15)	2,16 (n=22)	Yes (1%)	50%
Leadership	Reflective and Adaptive Mindset	2,69 (n=16)	1,94 (n=23)	Yes (5%)	39%
Leadership	Collaborative Leadership	3,06 (n=18)	2,26 (n=29)	Yes (1%)	35%

TABLE 6.2: COMPARING MEAN SCORES FOR THE NINE HALF DOUBLE METHODOLOGY PRACTICES



*** indicates that the difference in mean values for HD projects and reference projects are significant at a level of 99% ($\alpha = 0.01$).*

** indicates that the difference in mean values for HD projects and reference projects are significant at a level of 95% ($\alpha = 0.05$).*

FIGURE 6.5: PERCENTAGE DIFFERENCES BETWEEN HALF DOUBLE PROJECTS' AND REFERENCE PROJECTS' MEAN SCORES BY HALF DOUBLE PRACTICE

Altogether, the analysis shows that projects implementing the HDM are significantly different from projects practicing "business as usual" both when looking toward the individual practices as well as the summarized core principles.

On the principle level, the HD projects distinguished themselves least from normal projects in terms of Leadership, more in terms of Flow and most in terms of Impact.

Looking toward the individual practices, all nine practices are used significantly more in HD projects than in comparable reference projects – although with varying confidence levels. This means that the HDM way of managing projects is not business as usual.

As anticipated, this analysis confirms the hypothesis that all the HDM practices are being used significantly more in HD projects than in reference projects (i.e., not implementing the HDM). However, all HDM practices are not used with equal intensity. The differences in usage of HDM practices naturally leads to wondering why some practices are used more than others. While this question of why some practices become more prevalent than others is left unanswered for now, it does present an interesting opportunity for further research.

7 Diffusing the Half Double Methodology

By Anne Jensby, Pernille Nørgaard Boris and Per Svejvig (Aarhus University)

The purpose of this chapter is to report on the diffusion, or spreading, of the Half Double Methodology (HDM) within and across the first 16 case organizations from phase 1 and phase 2 of Project Half Double (PHD) plus an additional 17th case organization from phase 3. The aim of the chapter is to understand the degree of diffusion of the HDM in these 17 organizations. Additionally, the chapter provides an in-depth study within two single case organizations: Grundfos and GN Audio. These two case studies put the overall diffusion analysis into perspective by showing in detail how a diffusion process takes place and what it looks like within these organizations. The chapter draws on concepts within diffusion and management innovation and ends with a set of learning points and recommendations to guide future organizations aiming to scale and diffuse the HDM.

7.1 Literature on diffusion of management innovations

There is an extensive body of literature on the field of diffusion and adoption, developing an understanding of how things go from ideas to practice, identifying several key concepts (Ansari, Fiss, & Zajac, 2010). Table 7.1 serves as an overview of diffusion studies included in this section. It highlights some of the many concepts of diffusion theory. This report takes its point of departure in the diffusion of a management innovation which in our case is the HDM. Furthermore, we follow the definition of management innovation as suggested by Birkinshaw, Hamel, and Mol (2008). Their definition states that management innovation is defined as new management practices, processes, structures and techniques which are intended to further an organization's goals (Birkinshaw et al., 2008).

CONCEPT	AUTHORS	DEFINITION (EXAMPLE)
Management innovation	Abrahamson (1996) Birkinshaw et al. (2008) Birkinshaw and Mol (2006) Scarbrough, Robertson, and Swan (2015)	*"the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals"* (Birkinshaw et al., 2008, p. 825)
Management fashion	Abrahamson (1996) Perkmann and Spicer (2008)	*"is a relatively transitory collective belief, disseminated by management fashion setters, that a management technique leads rational management progress."* (Abrahamson, 1996, p. 257)
Adoption	Ansari et al. (2010) Turetken, Stojanov, and Trienekens (2016) Zeitz, Mittal, and McAulay (1999)	*"refers to its selection and initial use [of a practice] by an organization or subunit that had not used it previously"* (Zeitz et al., 1999, p. 743)
Entrenchment	Perkmann and Spicer (2008) Zeitz et al. (1999)	*"the institutionalization of a practice to the extent that it is unlikely to be abandoned"* (Perkmann & Spicer, 2008, p. 814)

CONCEPT	AUTHORS	DEFINITION (EXAMPLE)
Diffusion	Abrahamson (1996) Ansari et al. (2010) Guler, Guillén, and Macpherson (2002) Lawrence, Winn, and Jennings (2001) Scarbrough et al. (2015) Schlauderer and Overhage (2013) Perkmann and Spicer (2008) Vitharana and Dharwadkar (2007) Zeitz et al. (1999)	*"The process of introducing a practice to an organization – crossing its organizational boundaries"* (Zeitz et al., 1999, pp. 743-744)
Change agents	Abrahamson (1996) Birkinshaw and Mol (2006) Birkinshaw et al. (2008) Scarbrough et al. (2015)	*"internal change agents […] are the employees of the innovating company proactive in creating interest in, experimenting with, and validating the management innovation"* *"external change agents […] are independent consultants, academics, and gurus proactive in creating interest in, influencing the development of, and legitimizing the effectiveness and retention of new management practices"* (Birkinshaw et al., 2008, p. 832)
Adaptation	Ansari et al. (2010)	*"the process by which an adopter strives to create a better fit between an external practice and the adopter's particular needs to increase its "zone of acceptance" during implementation"* (Ansari et al., 2010, p. 71)
Institutionalization	Lawrence et al. (2001) Perkmann and Spicer (2008) Vitharana and Dharwadkar (2007)	*"objects are first recognized, then accepted by relatively few actors, and then widely diffused and broadly accepted within a field"* (Lawrence et al., 2001, p. 626)
Legitimacy	Ansari et al. (2010) Birkinshaw and Mol (2006) Birkinshaw et al. (2008) Lawrence et al. (2001) Perkmann and Spicer (2008) Vitharana and Dharwadkar (2007) Zeitz et al. (1999)	*"to make it [a new practice] acceptable to the various constituencies in the organization"* (Birkinshaw et al., 2008, p. 831)

TABLE 7.1: CONCEPTUAL OVERVIEW OF DIFFUSION LITERATURE

7.1.1 Change agents and management innovation

One of the very cited scholars of diffusion and adoption theory is Abrahamson who examines the adoption of management fashion (Abrahamson, 1996). He defines management fashion as "a relatively transitory collective belief, disseminated by management fashion setters, that a management technique leads to rational management progress" (Abrahamson, 1996, p. 257). Therefore, he argues that as a management practice becomes collectively fashionable, it tends to diffuse across organizations. Further, he emphasizes the role of change agents, or fashion setters and followers, in this diffusion process (Abrahamson, 1996). Fashion setters serve to identify and disseminate new management

fashions and introduce them to followers (Abrahamson, 1996).

The role of change agents has defined many studies of diffusion and management innovation, which this section will highlight. For example, as mentioned previously, Birkinshaw et al. (2008) define management innovation as new management practices, processes, structures and techniques which are to further an organization's goals. In this regard, they present the notion of internal and external change agents and their role in the shaping management innovation process (Birkinshaw et al., 2008). The process itself is divided into four stages of motivation, invention, implementation, theorizing and labelling, where internal and external change agents are assumed to play key roles shaping and driving the process, and therefore also the success of management innovation providing credibility and expertise (Birkinshaw et al., 2008).

Furthermore, external change agents (e.g. consultants or academics) and internal change agents (employees) are argued to build legitimacy of practices, which is defined as an important sign of acceptance of new practices in organizations (Birkinshaw et al., 2008). In this regard, Birkinshaw et al. (2008) emphasize the notion of cognitive legitimacy, as connecting new practices with the established belief system and reality in an organization. In another paper, Birkinshaw and Mol (2006) suggest management innovation as being a process initiated by a dissatisfaction with status quo, moving to inspiration, invention, internal and external validation and lastly to diffusion to other organizations. They suggest external validation to be the "essential stamp of approval from an independent observer" (Birkinshaw & Mol, 2006, p. 86), which for instance could be a consultant or academia who shape and legitimize the management innovation. Internal validation is suggested to be more crucial for gaining acceptance within an organization, as this represents employees legitimizing a management innovation (Birkinshaw & Mol, 2006).

Again, Birkinshaw and Mol (2006) highlight the role that agents play in the process of successful management innovation. Similarly, Scarbrough et al. (2015) examine the concept of management innovation employing the same definition as Birkinshaw et al. (2008). Scarbrough et al. (2015) explore the spread of management innovation across organizations. In doing so, they develop a model of the process, employing the concepts of diffusion and implementation. They argue that diffusion is the product of interplay by field level actors (Scarbrough et al., 2015). Meanwhile, implementation is on an organizational level. Thus, implementation and diffusion are dependent on actors who enact and interpret in order to diffuse and implement management innovation within organizations, which will influence the spread across organizations. Similarly, Guler et al. (2002) examine diffusion across borders, arguing that global firms imitate powerful organizations and their practices to boost their own performance and maintain competitiveness, and thus practices become diffused through networks – what they define as a coercive isomorphism.

7.1.2 From adoption to institutionalization and legitimacy

Zeitz et al. (1999) distinguish between the concepts of adoption and entrenchment in their analytical framework for two stages of management practices in organizations. Adoption refers to the initial use of a new practice in an organization (Zeitz et al., 1999). The notion of entrenchment refers to embedded practices that are likely to institutionalize, and thus endure and resist pressure for change (Zeitz et al., 1999). If

adoption does not result in becoming institutionalized and thus entrenched, it is instead defined as a fad: an adopted practice that is likely to be abandoned. In terms of their analytical framework, they distinguish between the adoption and entrenchment processes along six dimensions presenting a continuum of this adoption or entrenchment. In this regard, number of bases, compatibility, formality, depth, systemic coherence and interdependencies indicate level of adoption or entrenchment (Zeitz et al., 1999). Here, bases are understood as models, culture, education, regulation and technicalities, i.e. indicators which drive either adoption or entrenchment (Zeitz et al., 1999).

Ansari et al. (2010) examine the degree and timing of diffusion. They suggest that diffusion evolves during the process of implementation, and therefore require adaptation to become meaningful in a specific organizational setting. Thus, they propose examining the process of diffusion and adaptation by the (mis)fit between the practice to be implemented and the adopters, and furthermore argue that this degree of (mis)fit is influenced by technical, cultural and political factors (Ansari et al., 2010). By applying their framework, one can predict the organization's degree of adaptation on two dimensions: extensiveness and fidelity. Extensiveness can be viewed as a continuum of scope in terms of the number of practices used by an organization and the number of organizational teams/people using it. Fidelity can be seen on a continuum from distant, or low, to true, or high, implementation of practice in an organization, i.e. if the practices are translated, or adapted to the organization, or if the organization stays true to the practice (Ansari et al., 2010).

Furthermore, this can predict the timing of adoption, if it is early or late adoption, dependent on factors at play. Their framework of extensiveness and fidelity can be visualized as figure 7.1 (Adapted from Ansari et al., 2010, p. 74). Here, we identify extensiveness as scope, and fidelity as implementation.

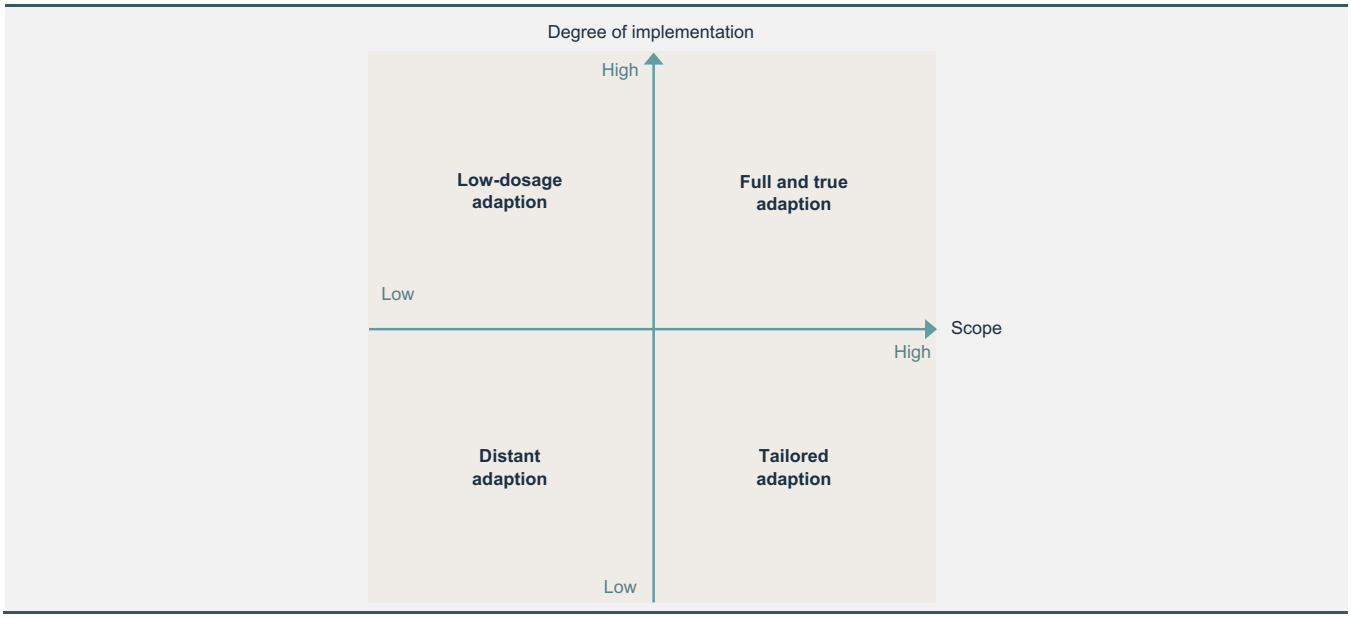


FIGURE 7.1: DIMENSIONS OF PRACTICE ADAPTATION

Lawrence et al. (2001) also examine the relationship between timing and process. They argue that pace and stability are two dimensions of timing of institutionalization. Furthermore, they emphasize that agents through influence, force, discipline or domination affect this pace and stability towards institutionalization (Lawrence et al., 2001). In their study, they define pace as "the length of time taken for management innovation to become diffused throughout an organizational field" (Lawrence et al., 2001, p. 627). As the management innovation is diffused, the focus shifts from pace towards stability, defining stability as "the length of time over which an institution remains highly diffused and legitimated" (Lawrence et al., 2001, p. 628).

Another example of institutionalization stems from Perkmann and Spicer (2008), who also argue that technical, cultural and political factors influence the effect of the institutionalization. Again, the role of actors is emphasized as paramount for institutionalization, finding that the success of institutionalization is dependent on the involvement of actors with cultural, technical and political skills being the source of isomorphic pressures (Perkmann & Spicer, 2008). Further, they emphasize the collective and uncoordinated actions by many actors, seeing institutionalization as an emerging process.

Vitharana and Dharwadkar (2007) also examine the process of institutionalization, suggesting a path of a stage of early acceptance followed by diffusion, a stage of stability, which can result in a stage of de-legitimization. With their study, they emphasize that the first stage of diffusion is rational, i.e. entailing reasons of efficiency to initiate diffusion, whereas the latter stage of stability is based on institutional factors, i.e. pressure from the environment to conform to institutional norms (Vitharana & Dharwadkar, 2007).

7.1.3 Diffusion of agile project management methodologies

Few studies explore the diffusion of agile project management methodologies; which this report also examines to an extent. One study originates from (Schlauderer & Overhage, 2013), who examine which factors determine the acceptance of agile methodologies by customers, applying diffusion of innovations theory. They take their point of departure in Scrum as an agile methodology and find that perceived relative advantages and compatibility are factors which drive acceptance of agile methodologies (Schlauderer & Overhage, 2013). Further, they find that perceived complexity can act as a barrier towards customer acceptance of agile methodologies.

Similarly, Turetken et al. (2016), examine the adoption level of scaled agile development, taking point of departure in the adoption of SAFe, a scaled agile framework created to help the scalability and integration of agile methodologies in organizations. They find indications of difficulties in fully adopting SAFe practices. Therefore, they have established a model assessing the maturity level of SAFe adoption, i.e., the SAFe maturity model (SAFe MM). This model identifies SAFe practices within five maturity levels. From different levels, one can establish the extent to which SAFe is adopted in an organization, and what the necessary steps are towards this adoption (Turetken et al., 2016). Table 7.2 summarizes the "SAFe Maturity model: levels, principles and practices" as presented by Turetken et al. (2016, p. 11).

	Principles				
	Embrace change to deliver customer value	Plan and deliver software frequently	Human centricity	Technical excellence	Customer collaboration
Level 5 Encompassing	• L5P1: Low process ceremony • **L5P2: Continuous SAFe Capability Improvement**	• L5P3: Agile project estimation	• L5P4: Ideal Agile physical setup • **L5P5: Changing organization**	• L5P6: Test driven development • L5P7: No/minimal number of level -1 or 1b people on team • **L5P8: Concurrent testing**	• L5P9: Frequent face-to-face interaction between developers and users (collocated)
Level 4 Adaptive	• L4P1: Client driven iterations • L4P2: Continuous customer satisfaction • **L4P3: Lean requirements at scale**	• L4P4: Smaller and more frequent releases • L4P5: Adaptive planning • **L4P6: Measuring business performance**	• **L4P7: Managing highly distributed teams**	• **L4P8: Intentional architecture** • L4P9: Daily progress tracking meetings	• L4P10: CRACK customer immediately accessible • L4P11: Customer contract revolves around commitment of collaboration
Level 3 Effective	• **L3P1: Regular reflection and adaptation**	• L3P2: Risk driven iterations • L3P3: Plan features not tasks • **L2P4: Roadmap** • **L3P5: Mastering the iteration** • **L3P6: Software Kanban Systems** • **L3P7: PSI/Release** • **L3P8: Agile Release Train**	• L3P9: Self-organizing teams • L3P10: Frequent face to face communication • **L3P11: Scrum of Scrum**	• L3P12: Continuous integration • L3P13: Continuous improvement (refactoring) • L3P14: Unit tests • L3L15: 30% of level 2 and level 3 people	• **L3P16: DevOps (Integrated Development and Operations)** • **L3P17: Vision, features** • **L3P18: Impact on customers and operations**
Level 2 Evolutionary	• L2P1: Evolutionary requirements • **L2P2: Smaller, more frequent releases** • **L2P3: Requirements discovery**	• L2P4: Continuous delivery • ***L2P5: Two-level planning and tracking*** • **L2P6: Agile Estimating and Velocity** • **L2P7: Release planning**	• **L2P8: Define/Build /Test team**	• L2P9: Software configuration management • **L2P10: Automated testing** • L2P11: Tracking iteration progress • L2P12: No big design up front (BDUF) • ***L2P13: Product Backlog***	• L2P14: Customer contract reflective of evolutionary development
Level 1 Collaborative	• L1P1: Reflect and tune process	• L1P2: Collaborative planning	• L1P3: Empowered and motivated teams • L1P4: Collaborative teams	• L1P5: Coding standards • L1P6: Knowledge sharing • L1P7: Task volunteering • **L1P8: Acceptance testing**	• ***L1P9s User stories*** • L1P10: Customer commitment to work with development team

TABLE 7.2: SAFE MATURITY MODEL – LEVELS, PRINCIPLES AND PRACTICES (TURETKEN ET AL. 2016)

7.1.4 Synthesising diffusion of management innovations

To sum up, this section serves as a theoretical point of departure for the following empirical sections. More specifically, we employ the notion of management innovation as suggested by Birkinshaw et al. (2008), which enables us to examine what happens for the 17 organizations after a new management practice, in this case the HDM, has been introduced. We will assess organizations' degree and dimensions of diffusion based on the framework of Ansari et al. (2010) and examine the role of change agents based on the thinking of Birkinshaw et al. (2008).

7.2 Overview of diffusion study

This section will present and discuss the diffusion of the 16 organizations of phase 1 and 2 of PHD. Furthermore, an additional organization is included. The names of the organizations have been excluded to make responses anonymous. The diagram in figure 7.2 presents all 17 organizations and their degree of implementation at the time of data generation. Four categories with different degrees of implementation have been established: Firstly, we have established a group of organizations with no implementation of the HDM. Second is the category of superficial implementation. The third category entails organizations with a medium degree of implementation. Lastly, the fourth category represents organizations with deep implementation. It is relevant emphasizing that the diffusion of the 17 organizations presented in this section is a snapshot of their diffusion at a given point in time. Thus, this diffusion should not be understood as the end result for the organizations. Likewise, it is worth noting that this section does not examine the extent of the use of the HDM practices, but instead we are investigating the spread of the HDM.

Furthermore, only a limited amount of the 16 organizations have had a deliberate strategy to diffuse the HDM (e.g., GN Audio). For most of the HD organizations, spreading and diffusing the methodology as part of PHD were not an active focus.

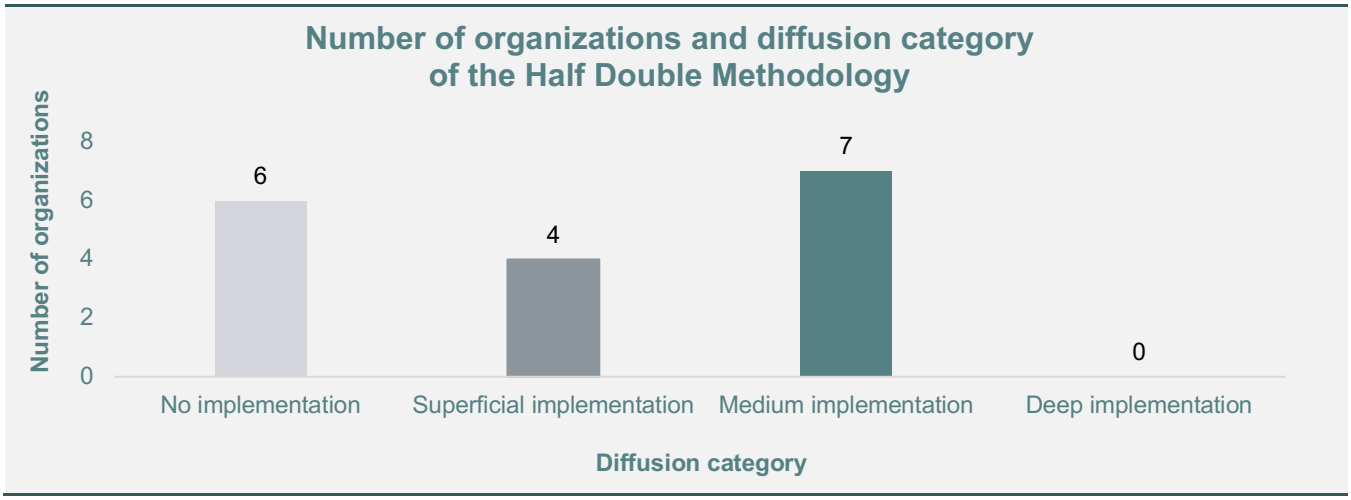


FIGURE 7.2: OVERVIEW OF 17 ORGANIZATIONS' DEGREE OF HALF DOUBLE DIFFUSION (AS OF 2019)

The visualization above illustrates that six of the 17 organizations have not implemented the HDM after the initial HD project(s) had finished. Four organizations have a superficial degree of implementation. Seven other organizations have a medium implementation of the HDM after HD projects have finished. None of the 17 organizations can be explained as having a deep degree of implementation of the HDM as of January 2020. In other words, 35% of organizations have no implementation of the HDM after HD projects were finalized. 24% of organizations have continued with the HDM to a superficial degree. 41% of organizations have a medium degree of implementation of the HDM. Thus, 65% of the 17 organizations still use the HDM to some degree after finishing initial HD projects during phase 1 and 2 of PHD.

The four different groupings have been established based on Scarbrough et al. (2015) grouping categories of no-, superficial-, medium- and deep implementation. The criteria for each grouping take point of departure in figure 7.1, the degree of implementation and scope, as suggested by Ansari et al. (2010). Table 7.3 highlights the different criteria used to assess the 17 organizations' implementation.

CATEGORY	DEGREE OF IMPLEMENTATION	SCOPE
NO IMPLEMENTATION	No or little and indirect implementation of the HDM, other potential practices are used instead.	None or few HDM practices used indirectly by handful of project employees or project teams in the organization.
SUPERFICIAL IMPLEMENTATION	HDM practices implemented superficially, thus used in combination with other project management methodologies/tools.	Implementation of some HDM practices by some project employees or project teams in the organization.
MEDIUM IMPLEMENTATION	HDM practices of medium implementation, thus entailing local adaptation of the methodology.	Implementation of several HDM practices and core concepts by many project employees or project teams in the organization.
DEEP IMPLEMENTATION	Deep implementation of the HDM, implementing HDM thoroughly, however open to meaningful adaptation.	Implementation of all the HDM practices by all or most project employees or project teams in the organization.

TABLE 7.3: DIFFUSION CATEGORIES AND CRITERIA

The following sections will examine each of the four groupings in relation to the 17 organizations.

7.2.1 No implementation

We define the category of no implementation as entailing organizations who have not employed the HDM in their project management. However, this group can potentially have the HDM in mind for future use or use few practices indirectly. Examining the six organizations with no implementation of the HDM, we find several reasons that can explain the lack of implementation. For two organizations, the primary employees working with the HDM in the HD projects are no longer employed in the organizations and therefore not present to employ and share the HDM. Here, only one person in one organization states a willingness to employ Visual Planning as a mindset for future projects. However, in four other organizations, the interviewees reveal that they have learned from working with the HDM. In one organization, an interviewee also emphasizes the HDM mindset; that visuals, Co-Location and Pulse Check are practices that they are planning to use in future projects. in another organization, the interviewees emphasize using the HDM indirectly in some projects to focus on value creation. This indirect focus is also present in a third organization, as it now has an increased focus on the notion of impact but using it unstructured in the sense that it is not directly connected to the HDM. Lastly, an interviewee in an organization states that there are burning platforms in the organization to take care of before working more with the HDM, but that it is imagined in the organization to use the methodology for its bigger projects in the future.

Returning to the theoretical overview in section 2, we can establish that the lack of Half Double (HD) trained employees, i.e., internal change agents, could have been a factor influencing the absence of implementation. According to e.g. Birkinshaw et al. (2008), internal and external change agents should work to legitimize the management innovation to remove potential skepticism and instead motivate employees and management to see value in the management innovation and legitimize it. Therefore, for the HDM to have endured in these six organizations, the employees trained in the HDM should remain present to spread and implement the HDM, possibly in combination with external change agents, i.e., consultants. Furthermore, the lack of the HDM implementation can also be linked to a lack of compatibility and the notion of fad (Zeitz et al., 1999) meaning that the HDM is

currently in a state of adoption where it is not entrenched, and risk not enduring over time. It can also be a sign of culture as a barrier to institutionalization (Perkmann & Spicer, 2008).

7.2.2 Superficial implementation

Four organizations categorize as with a superficial implementation of the HDM, meaning that they have implemented some HDM practices to a degree, but potentially in combination with other project management methodologies or tools. Furthermore, only certain groups or teams have engaged in the HDM in these organizations. A common denominator for the four organizations in this group is that they are engaging with core elements of the HDM. For example, in one organization the core elements of the HDM such as Leadership and Impact are used. Further, employees use an internal project management guide based on a combination of IPMA and HDM practices. In a second organization, an interviewee also emphasizes the focus on fast Impact as well as Flow in their project management. Furthermore, an employee from the same organization mentions a focus on employing Pulse Checks, Co-Location and Visual Planning in other projects. An interviewee in a third organization points out using several HDM practices in their projects, but without labelling them as such. In a fourth organization the practices of Kill Complexity and Pulse Check have been employed in several projects and is incorporating HDM practices in 2-10 other projects than the HD project and with the same project manager. This highlights the degree of scope (Ansari et al., 2010); that this group of organizations chooses few specific methods within the HDM, and only a small group of employees have been introduced to the HDM. Correspondingly, there can be a lack of change agents who can inspire, motivate and add validation to the new management innovation, which can result in further diffusion (Birkinshaw & Mol, 2006).

In the four organizations with superficial implementation, the interviews suggest they have faced different issues in regard to the diffusion of the HDM. Interviewees in two organizations reveal that the lack of HDM implementation can be due to structural changes in the organization, i.e., new management without any HDM awareness. This can be linked to Ansari et al. (2010) and Perkmann and Spicer (2008) emphasis on cultural factors, i.e., that management can act as a barrier to the diffusion process, and thus not provide any legitimization or validation to the management innovation (Birkinshaw & Mol, 2006). For the two other organizations, there is an emphasis on the use of other project management methodologies and competence standards such as IPMA, Stage Gate model and Agile 42. Potentially, there can be a lack of compatibility between the HDM and other project management practices that are embedded which, according to the adoption-entrenchment continuum (Zeitz et al., 1999), can result in a lack of entrenchment, and instead they remain in a phase of adoption. Furthermore, one organization stands out, as employees have used many HDM practices, also prior to the HD project, without knowing or labelling it as such. This is for example Short and Fat Projects and Visual Planning. Therefore, they have a superficial to medium degree of application, however, this may not be due to the official HDM implementation. Interviewees in another organization also emphasize a use of HDM practices post their HD project, and without labelling them as HD. This lack of formality can also be a barrier towards entrenchment according to the dimensions of the adoption-entrenchment framework (Zeitz et al., 1999).

7.2.3 Medium implementation

As shown in figure 7.2, seven organizations categorize as having a medium implementation of the HDM, which means that several of the HDM practices are employed although with a degree of local adaptation across the organization. An interviewee in one organization emphasizes employees having a general positive view on the HDM and also a high degree of managerial support in employing the HDM in future projects, enhancing hierarchical internal validation to the HDM practices (Birkinshaw & Mol, 2006). As of September 2019, this organization had four projects employing the HDM with deep implementation and expects 10 more projects with deep implementation in the near future. In this organization, it is expected they will use the HDM in that 15 other projects in the second half of 2019, however, on a superficial level, emphasizing the HDM concept of Flow. Another relevant finding from this organization is its ability to spread the HDM to other organizations. This organization shared the HDM with a supplier through a joint project, which is believed to have shared the HDM with other organizations. Thus, in one organization employees were able to diffuse the HDM across to other organizations, which can be a bandwagon effect (Scarbrough et al., 2015) or isomorphism (Perkmann & Spicer, 2008), by which the first organization proves HDM to be legitimate, successful, credible and potentially even a must-have. This allows for the HDM to spread from organization to organization. This notion of legitimacy and credibility can be linked to the important role of successful internal change agents, which can be why the organization emphasizes the positive attitude towards the HDM from employees and management (Abrahamson, 1996; Birkinshaw et al., 2008; Birkinshaw & Mol, 2006). According to Lawrence et al. (2001), this positive attitude and dominating enforcement from management can help the process towards a stable institutionalization of a management innovation such as the HDM. The same organization states having worked with consultants on internal initiatives to spread HDM, and to train and motivate employees to employ the HDM through communicating impact of the projects across the organization. This highlights the use of external change agents legitimizing and shaping the management innovation process (Birkinshaw et al., 2008). An employee in another organization describes how they have attempted to copy their HD project to another department in a different location in Denmark together with consultants. In the department of the original HD project, they continued using several HDM practices such as Co-Location, Visual Planning and reaching goals faster, and they have experienced positive results in doing so. Interviewees in a third organization also highlight the use of visuals together with sprint planning from which they have experienced positive results. Furthermore, they state noticing an increase in employee participation when planning is a visual and physical process in paper rather than in the form of Excel sheets on a computer. They have continued to use the HDM in 12 projects in Q1-Q2 2019, 10 projects in Q2-Q3 2019, and expect 8 projects using the HDM in Q4 2019. Furthermore, they have worked with consultants in an additional HD project.

Employees in one organization were introduced to the HDM by a customer through a joint project. They state that they have employed the HDM in all of their projects, however in different degrees, emphasizing that specific practices are selected and employed (Ansari et al., 2010). Especially, they have used Impact Case and Pulse Check, and state that employees and collaborative customers are positive about the HDM, again highlighting the role of change

agents and the motivation to adopt the HDM from another organization (Scarbrough et al., 2015). Furthermore, they have implemented their own project model based on the HDM. This emphasizes adaptation of the management innovation (Ansari et al., 2010). A number of their projects have a medium degree of implementation of the HDM, and a HD project has a deep implementation. Further, the interviewee highlights working with minimum viable projects, meaning a superficial use of HDM with sprint plans, which they have employed in almost all of their other projects. Employees in another medium implementation organization state that they have based their projects on the "HDM philosophy" to a high degree, which has resulted in several successful projects. Furthermore, they argue that half of their projects have deep implementation of the HDM, and the other half medium implementation. However, they do not refer to their project management as the HDM and argue that the reason for this was having gotten the methodology "under their skin", and also having used some of the practices before their HD project.

In one organization it is revealed that they have a project forum in which project managers are trained in the HDM. An interviewee states that employees are motivated to use the HDM to speed up projects in their quality department, suggesting internal validation as a result of success with the HDM (Birkinshaw & Mol, 2006) and by having consultants introduce the methodology to this department, emphasizing the role of external change agents to add validation (Birkinshaw et al., 2008). Additionally, they emphasize the use of HDM tools such as visuals, being close to decisions, Co-Location, 50% allocation and Pulse Checks. They have used the HDM in 7-8 bigger projects with more than 20 participants. Furthermore, they have used the HDM in several other smaller projects. However, the same organization states difficulties in following the Leadership and Impact principles due to the organizational governance structure, emphasizing how complexity can act as a barrier to the diffusion process (Schlauderer & Overhage, 2013). Nonetheless, through active Local Translation they have been able to work with Leadership and Impact. Another barrier in the organization is little knowledge sharing between departments, resulting in the HDM not diffusing into other departments. An employee in the HR department argues that a barrier for departments to implement the HDM is that HDM requires a change from management, and that management in other organizations have reached out to her out of curiosity, interested in the HDM.

Lastly, in one organization an interviewee states a two-year strategic focus on the HDM with the help of consultants. Interviewees state an impact gained from the focus on impact sessions, meetings, Pulse Checks, sprint plans, and dialogue-based planning, helping them to create Flow in the project, focus on fast Impact and identify interorganizational dependencies. They express difficulties in fully focusing on Leadership, lacking project owner and steering group, but this due to organizational change. At the same time, they also highlight the importance of Local Translation, e.g., in terms of Co-Location, to ensure that the methodology functions well with the organization.

As indicated above, one of the hurdles found in this group of organizations is the difficulty in communicating the HDM to employees to convince them to employ the methodology. In one organization it was attempted to transfer the HDM practices to another department in another location, but without success, arguably due to departmental cultural

differences. In the same organization, new management have had more critical tasks to focus on. An interviewee in the organization suggests this could be the reason why the HDM is not shared across departments. However, they expect to focus on employing HDM on projects in 2020. Thus, the organization can have some cultural barriers that result in a degree of misfit between the HDM and the organization (Ansari et al., 2010) or lack of compatibility (Zeitz et al., 1999) for full, deep implementation. Furthermore, the difficulty in convincing other employees to embrace the HDM suggests that employees have yet to become inspired or motivated by change agents for the HDM to spread (Birkinshaw et al., 2008; Birkinshaw & Mol, 2006). Another issue in implementing and spreading the HDM could be that some of the organizations do not refer to their practices as specifically HDM practices, suggesting that the HDM has yet to become deeply embedded in the organizations, due to lack of formality or systemic coherence (Zeitz et al., 1999). However, an interviewee in one organization emphasizes this lack of labelling as due to them getting the methodology 'under their skin'. Furthermore, some organizations also state not using all practices, e.g., Co-Location and Pulse Check, or at least experiencing difficulties with some, emphasizing a Local Translation excluding practices that are not relevant for them.

7.2.4 Deep implementation

We argue that deep implementation means applying the HDM thoroughly in multiple projects, albeit with some adaptation. However, none of the 17 organizations are at a deep level of implementation, as of yet. Some organizations do selected projects with deep implementation, and one organization is actively moving towards the category of deep implementation. This organization is GN Audio, whose diffusion process will be described in detail in section 7.4. The next section summarizes the findings of the 17 different cases by presenting the organizations' benefits of the HDM together with the main issues that the different organizations are facing.

7.2.5 Overall diffusion

Table 7.4 summarizes the benefits and issues identified in the overall diffusion study. We find that several organizations' degree of diffusion is highly impacted by internal and external change agents as well as the cultural factors of the organization. Thus, change agents' and management's motivation, success stories and legitimization of HDM could have had a significant impact in the spread of the HDM, as it becomes a more valuable methodology for project management. An additional insight is the degree of adaptation of the HDM in the different organizations customizing the HDM to the local governance and mindset of the organization. This corresponds with one of the core principles of the HDM, namely Local Translation and can perhaps also explain why a majority of the 17 organizations score a medium degree of implementation and not a high degree.

	FIRM	IMPLEMENTATION BENEFITS	IMPLEMENTATION ISSUES
NO IMPLEMENTATION	1	N/A	Organizational change and the employees taught the HDM are no longer employed
	2	More focus on Impact	Does not label it as the HDM, and do not talk about HDM
	3	More focus on value creation	The HDM has not been employed after the HD project finished
	4	N/A (plan to use Co-Location, Visual Planning and Pulse Check for a later project)	Employs Kaizen, an approach that the organization is more used to
	5	Interviewee has learned to Work with Visuals	Organizational change and new management
	6	N/A	Burning platforms to take care of
SUPERFICIAL IMPLEMENTATION	7	Focus more on faster Impact and Flow	Continues to use Agile 42 and Scrum. Use practices, but do not refer to them as the HDM. Challenged by Co-Location
	8	N/A (used many of the practices before being introduced to the HDM)	Does not label it as HDM
	9	Satisfied with results from the HDM, focus on Leadership and Impact	Structural changes in management as a barrier. Follow IPMA guide
	10	Positive about the HDM, benefitted from Pulse Check and Kill Complexity	New management's resistance, and only one employee was educated in HDM
MEDIUM IMPLEMENTATION	11	Very enthusiastic of the HDM, has documented positive results and more participation	Does not use all practices (e.g., Co-Location and Pulse Check), does not refer to practices as HDM
	12	Focus more on Flow and Impact, and has experienced faster delivery	Reluctant to change, challenged by Co-Location and the principle of Leadership
	13	Employees and customers are positive towards the HDM, learned of the HDM from a customer	Uses practices to different degrees of projects
	14	High degree of managerial support, positive towards the HDM. Diffused the HDM to supplier	Difficult to convince (or communicate to) people to use the HDM
	15	Increased project success rate	Does not refer to the practices as explicitly the HDM
	16	Have experienced positive results with the HDM, reaching goals faster	Hard to transfer to other departments, organizational culture acts as a barrier as well as new management
	17	Speed up projects in the departments, and more focus on Flow	The organizational change, management acts as a barrier, corporate governance

TABLE 7.4: BENEFITS AND ISSUES WITH HALF DOUBLE METHODOLOGY IMPLEMENTATION

The following two sections examines two specific cases.

First, Grundfos is introduced as an organization with superficial degree of implementation. Second, GN Audio is introduced as an organization with a medium degree of implementation.

7.3 Superficial implemention in Grundfos

Grundfos is the world's largest pump manufacturer, based in Denmark, with more than 19,000 employees globally and a turnover in 2018 at 26,721 million DKK. The annual production is more than 16 million

pump units, circulator pumps (UP), submersible pumps (SP), and multi-stage pressurizing pumps (CR) as the main product groups. Grundfos also produces electric motors for the pumps as well as electric motors for separate merchandising. Grundfos develops and sells electronics for controls for pumps and other systems. The Grundfos motto is “Be-Think-Innovate”, and Grundfos is very focused on innovation and research in order to maintain its market leading position. Day-to-day contacts between research and development centers in Denmark, China, India and the US are made through video conferences and virtual systems. Big global development projects are carried out in several locations in the world.

7.3.1 The first step with the Half Double project

In 2012, Grundfos established a project model for frontloading projects consisting of three stages after ideation: Initiate, create and mature. Frontloading projects are used as a way to accelerate the knowledge and remove major uncertainties prior to product development. The HD project was a frontloading project and was initiated to assure Grundfos an increased market share whilst maintaining its leading position as a world-class pump manufacturer. This was expected through the development of a robust concept which not only needed to be technically feasible but also to have the projected attractiveness and impact for Grundfos’ customer segments.

The overall aim with the HD project was also to reduce time to market in the R&D process. Initially, Grundfos was interested in trying out three of the leading stars defined in the early phase of PHD: Focus on Customer Value, Kill Complexity, and Visual Planning. In reality, the HD project experiment became a mixed approach of leading stars and the HDM, and it is difficult to isolate them from one another. Even though the frontloading phase of the HD project ran smoothly and could have been terminated sooner, lead time still depended on the next step in the development process being allocated and ready to take over. Moreover, outside contingencies and management decisions resulted in a further delay. Consequently, the HDM did not reduce time to impact or impacted on the overall Grundfos business. Still, HDM practices such as the Pulse Check, Visual Planning and Co-Location have been reported to work well and contributed beneficially to running the HD project.

7.3.2 Story about the adoption process in Grundfos

In order to understand the adoption process of the HDM in Grundfos after the ending of the HD project, figure 7.3 illustrates how Grundfos is organized and how many people are employed in each department. The green boxes show departments that have knowledge about the HDM and used elements of the methodology.

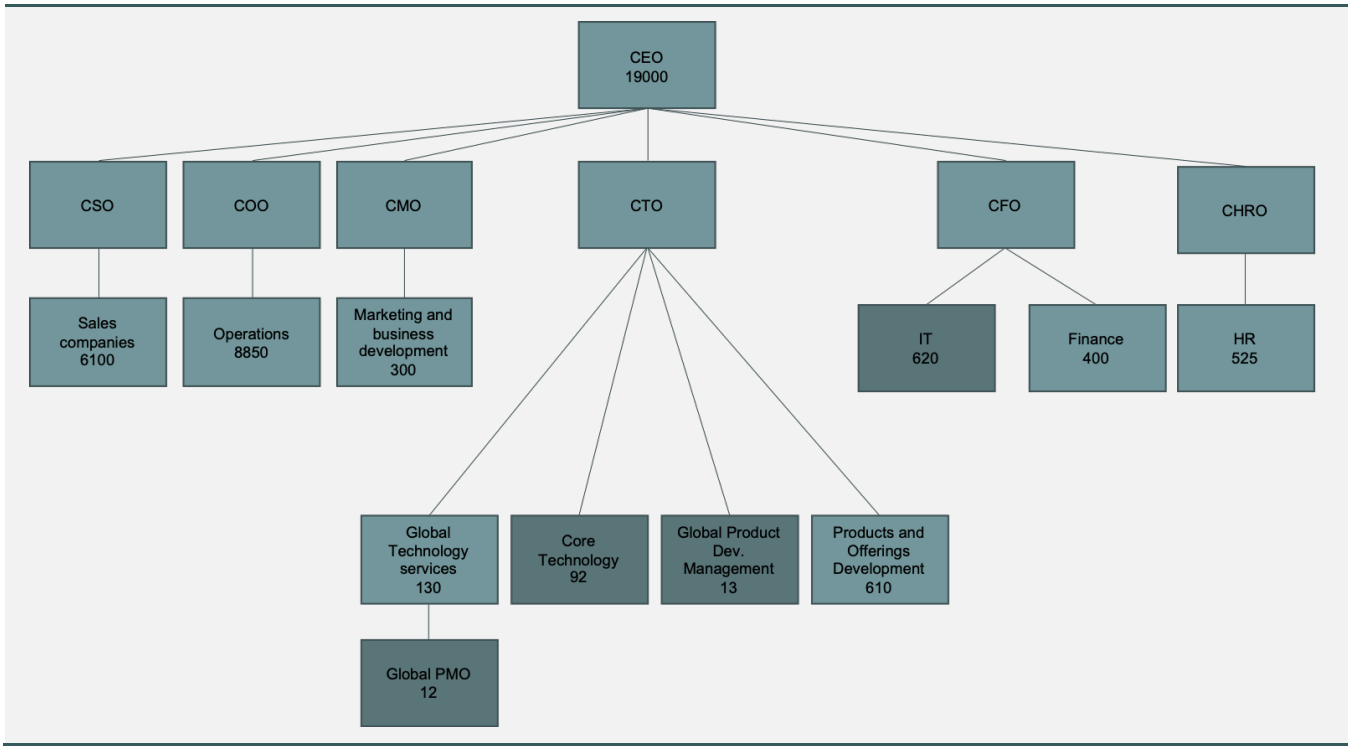


FIGURE 7.3: ORGANIZATION DIAGRAM OF GRUNDFOS

The HDM has been applied in the *IT* department, which is part of the CFO's responsibility, and within *Core Technology, Global Product Development Management, and Global PMO* which are within the CTO's responsibility. Grundfos implemented the HDM deeply during the HD project in the *Core Technology* department. After the closure of the HD project in 2015, the *Core Technology* department has used elements of the HDM superficially, meaning that they have used the HDM as a philosophy or a mindset rather than strictly executed all the practices (Scarbrough et al., 2015). Without referring to the HDM when executing projects, they have acquired several of the HDM practices – especially the core elements of Impact and Flow. The Leadership element was considered harder to follow because of the distance to the project owner. The philosophy has diffused to the *IT department* through an external network and additional outreaching search for information about the HDM. One project manager from the *IT department* participated in an HDM education course with the purpose of trying some of the tools in a project. The outcome was positive, and the *IT department* agreed on the potential for improving IT projects, as they were able to copy some of the practices which were experienced to have a positive effect in Grundfos (Zeitz et al., 1999).

The *IT department* in Grundfos then invited Implement Consulting Group with the purpose of educating around 20 project managers in the HDM within the *IT department*. The goal was to implement the HDM in 3-5 projects but did only succeed in executing one HD project, as it was difficult to persuade business partners to use the methodology fully. Zeitz et al. (1999) also state that education is just one of the bases for entrenchment of management practices (Zeitz et al., 1999). However, Grundfos has experienced some resistance against the implementation of the HDM from the employees and

difficulties getting external business partners onboard, which restrict their possibility of using the entire set of elements in the method. It is vital to recognize that the *IT department* experiences the HDM as a mindset rather than a strict methodology, and therefore refers to the HDM as introduced rather than implemented. One of the project managers in the *IT department*, who was educated by Implement Consulting Group, has further adopted a full-blown version of the HDM to a project involving both internal and external parties. The project involved a critical deadline where the process required phases and sprints, and the need for agility motivated the project manager to use the HDM. Hence, the method was initiated to count for uncertainties, in which an agile method was considered suitable to overcome those uncertainties. The project involved approximately 25-30 employees in different countries, where a project room was dedicated to the project. The project room provided a significant positive outcome, but different locations made it difficult to use onsite visualization, hence an online visualization tool was used to simulate the effect. During the project the method was not labelled as HD, though the project manager was aware that the method was used. The *Global PMO Excellence* department has made four agile HD project teams. The projects have agility in view, but it is considered that they may use several HDM practices without an HDM "label", as management innovations like the HDM are often tacit in nature, and the boundaries can be blurred (Birkinshaw et al., 2008). For example, the *Global PMO Excellence* department has had an increased focus on value and impact rather than a task focus, which is part of an agile way of thinking but also vital in the HDM. Every year the project manager community in the *Core Technology* department in Grundfos has one project leadership focus point that they pay extraordinary attention to and which is the pivotal point for the community meetings that are held four times each year.

In 2018, the HDM was a subject at the community meetings. In 2019, the focus point at the community meetings has been agile ways of working more in general rather than with a specific methodology. The reason being that they are in the middle of a transformation of becoming more agile. In line with that, they want to change the culture and overall mindset of the employees within the organization to a more agile way of thinking. Within *Core Technology*, the HDM is not considered as a general approach for cultural change towards agility, but rather as a framework with specific practices for executing projects. That is the reason why Grundfos has chosen to continue a collaboration with "Agile 42". Grundfos has therefore not directly used the HDM, but instead included the HDM as a mindset and used the underlying philosophy of the core elements. "Agile 42" assists Grundfos in their progress of changing for an agile mindset and does not come up with specific practices to execute projects. However, the departments that already have implemented the HDM in Grundfos are still executing projects where they are inspired by the HDM.

7.3.3 Adoption of the methodology within Grundfos

To summarize the adoption process in Grundfos described above, figure 7.4 illustrates a Heat Map visualizing the implementation depth (Scarbrough et al., 2015) of the HDM in Grundfos and the adoption and diffusion according to time and number of projects.

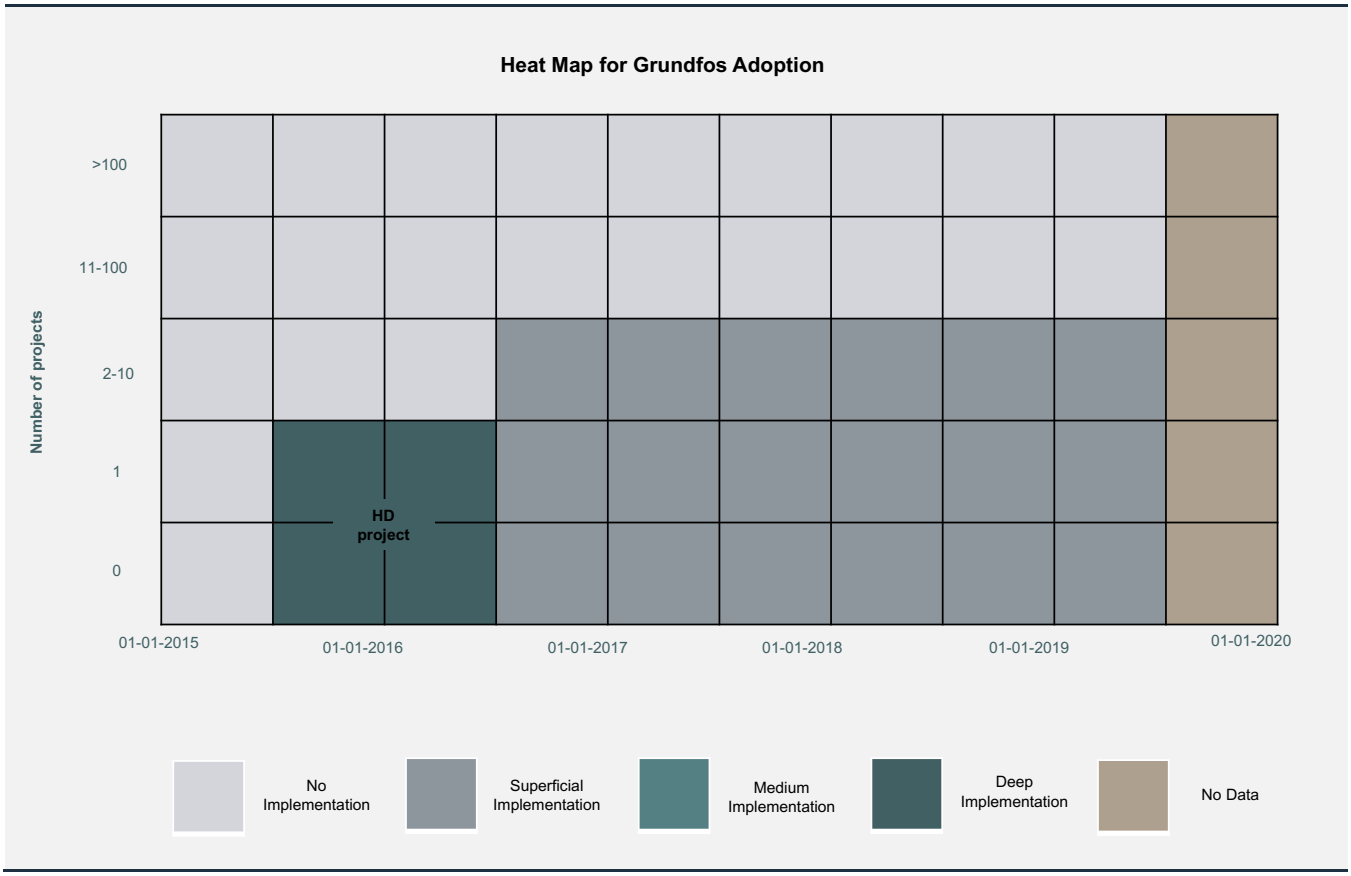


FIGURE 7.6: HEAT MAP OF HALF DOUBLE METHODOLOGY IMPLEMENTATION DEPTH IN GRUNDFOS (AS OF AUGUST-OCTOBER 2019)

The Heat Map for Grundfos shows a deep implementation of the HDM in the HD project, where the practices were executed to a high degree. After the HD project, other departments have been motivated to use elements of the HDM practices and the methodology has diffused to the *IT*, *Global PMO Excellence,* and *Global Product Development Management* department in Grundfos. It is not possible to conclude that the three departments have implemented the HDM practices in the sense of the word "implementation".
Rather, the methodology has been introduced, meaning that project managers are encouraged to include the HDM as a mindset and to use the underlying philosophy of the core elements especially focusing on the core elements of Impact and Flow.

This indicates that the three departments have adopted parts of the mindset behind the HDM. In relation to the terminology of the Heat Map, the overall implementation depth of the HDM in Grundfos is considered superficial, as some of the practices are used but may be used unconsciously.

A challenge regarding the adoption and diffusion of the HDM in Grundfos is that the diffusion of the method has not been a top-down process, but rather has been considered as a grassroots movement. Hence, there has been no common goal for

the entire firm to think in HDM terms, which potentially has been restricting the diffusion of the methodology. Furthermore, Grundfos is a large organization with multiple geographical locations, which
has challenged the use of Co-Location and visualization, both due to resource difficulties of getting a dedicated project room and due to the geographical element as the project team is spread over different locations.

Some effort was put into the use of technical solutions to simulate Co-Location and Visual Planning, but the experience was that the practices across countries require technical solutions that were not available at the time.

7.3.4 Next step in Grundfos

Grundfos has decided to put an effort into transforming the organization to a more agile way of thinking, which is the focus point of 2019 in the organization. It has collaborated with "Agile 42" in order to get support in favor of changing the mindset of the employees, moving from management to leadership and the general culture within Grundfos. The agile mindset is implemented differently in different departments, which also reflects in choices related to project management. However, the *IT department* has an objective of making all project managers consider the nine elements of the HDM when executing projects to evaluate on the potential success of the projects and reflect on the possible benefits of the use of HDM practices.

7.4 Medium implementation in GN Audio

GN Audio is part of GN Great Nordic, a Danish-based technology group founded in 1869. GN Audio was founded in 1987 and is among the leading and fastest growing suppliers of intelligent audio solutions. GN Audio operates in three regions: 1) America, 2) Europe, The Middle East and Africa and 3) The Asia-Pacific. GN Audio has approximately 1,700 employees, and its head office is located in Ballerup, Denmark.

7.4.1 The first step with the Half Double project

The HD project at GN Audio is categorized as a sales and IT project and is about developing new ways of working with digital sales. By launching a new marketplace through the application of the HDM, GN Audio will be able to reduce its project lead time and time to market dramatically. Concretely, the HD project's ambition was to reduce GN Audio's project development lead time from 9 to 3 months, i.e., reducing the project's time to impact. Since its launch of online sales channels, one of GN Audio's challenges has revolved around a tendency of stagnating launches due to heavy re-work in order to correct errors from previous launches, thus tying up resources that could have been utilized elsewhere to perfect existing channels and develop new channels. The HD project had a reduced lead time to market and higher quality compared to reference projects. Subjectively, this is considered a successful result of implementation of the HDM (Rode et al., 2019; Svejvig, Adland, et al., 2017; Svejvig et al., 2016; Svejvig, Rode, et al., 2017).

7.4.2 Story about the adoption process in GN Audio

In order to understand the adoption process of the HDM in GN Audio, figure 7.5 illustrates how GN Audio is organized. The green boxes show departments that have knowledge about the HDM and used elements of the methodology.

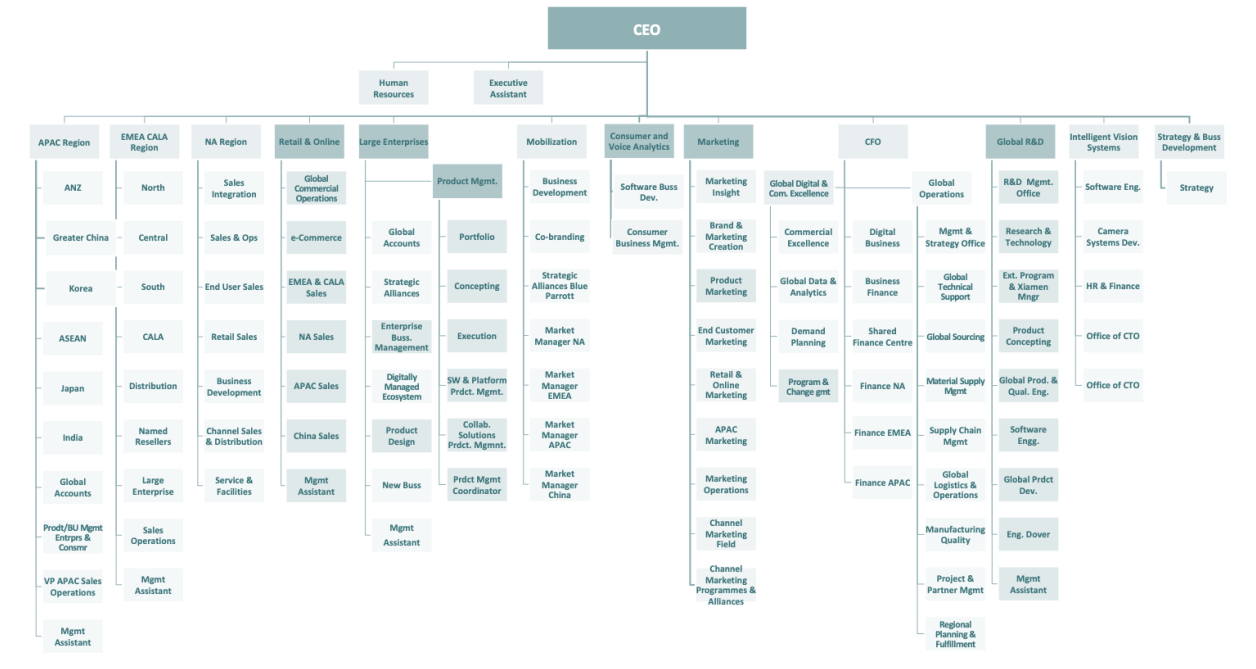


FIGURE 7.5: ORGANIZATION DIAGRAM OF GN AUDIO

The HD project was executed in the Retail & Online department in 2016, where in this case the description is mainly considering the Global R&D department. The HDM is not solely a Global R&D initiative even though it was initiated and driven by the Global R&D department. It is implemented across operations, where other operations include Product Management (Product Mgmt.), Product Marketing (Mkt), and Design and Business Management (Business Mgmt.). Furthermore, Product Management and Marketing are also trained in the HDM with teams participating in Product Development. Here, it is worth noticing that the use of the methodology in the Global R&D department is not linked to the HD project in the Retail & Online department.

Note that the organization structure and names have changed from 2016 to 2019. The displayed organization chart and department names used are based on the version from November 2019.

The Global R&D department

The Global R&D department has approximately 400 employees and approximately 15-20 projects in progress with different characteristics. The HDM was introduced in the Global R&D department as a part of the 2017-2019 strategy project sponsored by the CEO, the Head of Global R&D and Global R&D Management from its initiation. This was based on an agreement between the CEO and the Global Management Team (GMT) members representing Global R&D, Product Management, Global Operations, Business Management (representing Sales), Product Management and Product Marketing.

The agile approach, the simplicity and the focus on collaboration that the HDM offers matched well with the way the department wished to drive projects and was the driving force for the introduction of the methodology. Moreover, the HDM seemed like a great fit with the company culture, as there previously has

not been a focus on a single specific project management methodology. Instead, there was a checklist where each project member was responsible for matching the expectations on the list. The HDM was introduced with the intention to decrease time to delivery, hence faster delivery, which led them to establish contact with a consultancy: Implement Consulting Group (ICG).

The R&D Management Office was presented with and trained in the HDM in Autumn 2017 by ICG. During the training, several projects were pointed out, in which the HDM was tested. This meant that the majority of all larger projects, which were seven projects in all, in the Global R&D department started practicing the HDM to some extent in 2018. These projects account for a substantial fraction of their budget.

Establishing a concepting organization

The establishment of a concepting organization in 2018 resulted in three somewhat fixed and dedicated concepting teams being created to ensure that the necessary technology was present when a project was initiated. The seven projects sourced different employees from different groups, as well as using the fixed concepting teams, which are teams who work on the concepting phase of the project.

The concepting phase is the initial phase, where research and development of concepts and technologies happen. Prior to the concepting phase, there is a phase called “front end”, where it is decided what to develop, what features should be included and what customer needs are to be satisfied. When going into the concepting phase, the Impact Case has already been defined. The technical solutions needed is what is defined in the concepting phase. The actual development of the product is done in the execution phase which is subsequent to the concepting phase.

The concepting phase consists of three corresponding teams, which are divided into two different locations, where two are located in Ballerup, Denmark and one in China. The two teams in Denmark typically start in a pre-concept phase, where technologies are tested to create features, which afterward move into the actual concepting. The training provided to the organization in Denmark was done jointly by two representatives, of whom one was from GN Audio and one was from ICG. Training was also given to the department located in China by two representatives from GN Audio approximately at the end of 2018, but no training has been initiated since. In one of the examples discussed during the interview, the project manager in question received training prior to the initiation of the project but did not receive any counseling during the project. Hence, translation and adjustment of the methodology were done without external assistance. However, it should be noted that the subjective opinion was that with an ambitious time schedule a delivery with only two weeks’ delay was considered successful.

Introducing the HDM in the Global R&D department

The introduction of the HDM in the Global R&D department started after training ended in December 2018. Initially, ERFA groups[1] were created for promoting self-learning, but in

[1] An ERFA group is a smaller group of professionals who share knowledge related to a professional area.

order to focus on creating a Local Translation of the HDM these groups were put on hold, while onboarding a new manager in the project manager organization.

The Global Management Team (GMT) made an official statement in 2018 saying that all projects must use the HDM, but it is recognized that there is a transformation process and that there are employees who are reluctant to make the transition. This means that the project managers in the Global R&D department are currently expected to apply the HDM.

The Global R&D department executed an internal HD project, when this internal HD project was closed in 2019. Furthermore, all projects starting after January 2019 were expected to follow the HDM, but the internal set up did not allow for GN Audio to follow through on this immediately. In 2019, all project managers were measured at a KPI level through a survey sent out in Q2, Q3 and Q4 related to their use of the HDM.

The introduction of a support function

It should be noted that the process of implementing the HDM is internally in the Global R&D department considered as officially starting in September 2019, where the *impact model* template was internally developed to be used in future projects within the Global R&D department. All projects prior to September 2019 were allowed to keep their initial project management method, where all future projects were to implement the HDM.

The process up until September 2019 is very different from the current practice of the HDM in GN Audio. The main difference is the establishment of a support function, where support is provided to help implement the HDM in practice. The support function was staffed in June 2019, where GN Audio consider their level of Local Translation of the HDM to be 70%. The support function serves as the *Local Translation*, where examples hereof include using their own words to describe the practices and building their own templates to be used in projects practicing the HDM within the organization.

The role of the project management office in an HDM set up

The HDM initiative was initiated and driven by the Global R&D Management Office responsible for Strategy and Process development throughout the Global R&D department. Since January 2019 the Global Project Management Office (PMO) is part of the Global R&D Management office. This means that the HDM initiative within GN Audio is not driven by the PMO office, but instead, the HDM has diffused to the PMO through the Global R&D department.

As not all project teams currently use the methodology, the PMO department have found themselves in a process of figuring out how the HDM can co-exist and interact with the existing practices related to for example compliance with regulations and standards. The diffusion lies in the methodology becoming a part of the methods used by teams within the project portfolio, and therefore what role the PMO department plays in an HDM set up.

It is worth noticing that not all projects in all departments use the HDM at the moment but are expected to in the future. This leads to current challenges related to the fact that project management teams using HDM practices are expected to allocate +50% of their time to HD projects when working on multiple projects possibly with other project management methods. The solution approach has been to focus on what the PMO sees as the most important contribution from the HDM,

namely the planning and impact sessions. They have experienced that they must be careful about not being too strict about using the HDM and instead translate the methodology, so it matches their organizational structure both in relation to different project methods, project teams, resources available and geographical location.

7.4.3 Adoption of the methodology within GN Audio

To summarize the adoption process in GN Audio described above, figure 7.6 illustrates a Heat Map visualizing the implementation depth (Scarbrough et al., 2015) of the HDM in GN Audio and adoption and diffusion according to time and number of projects.

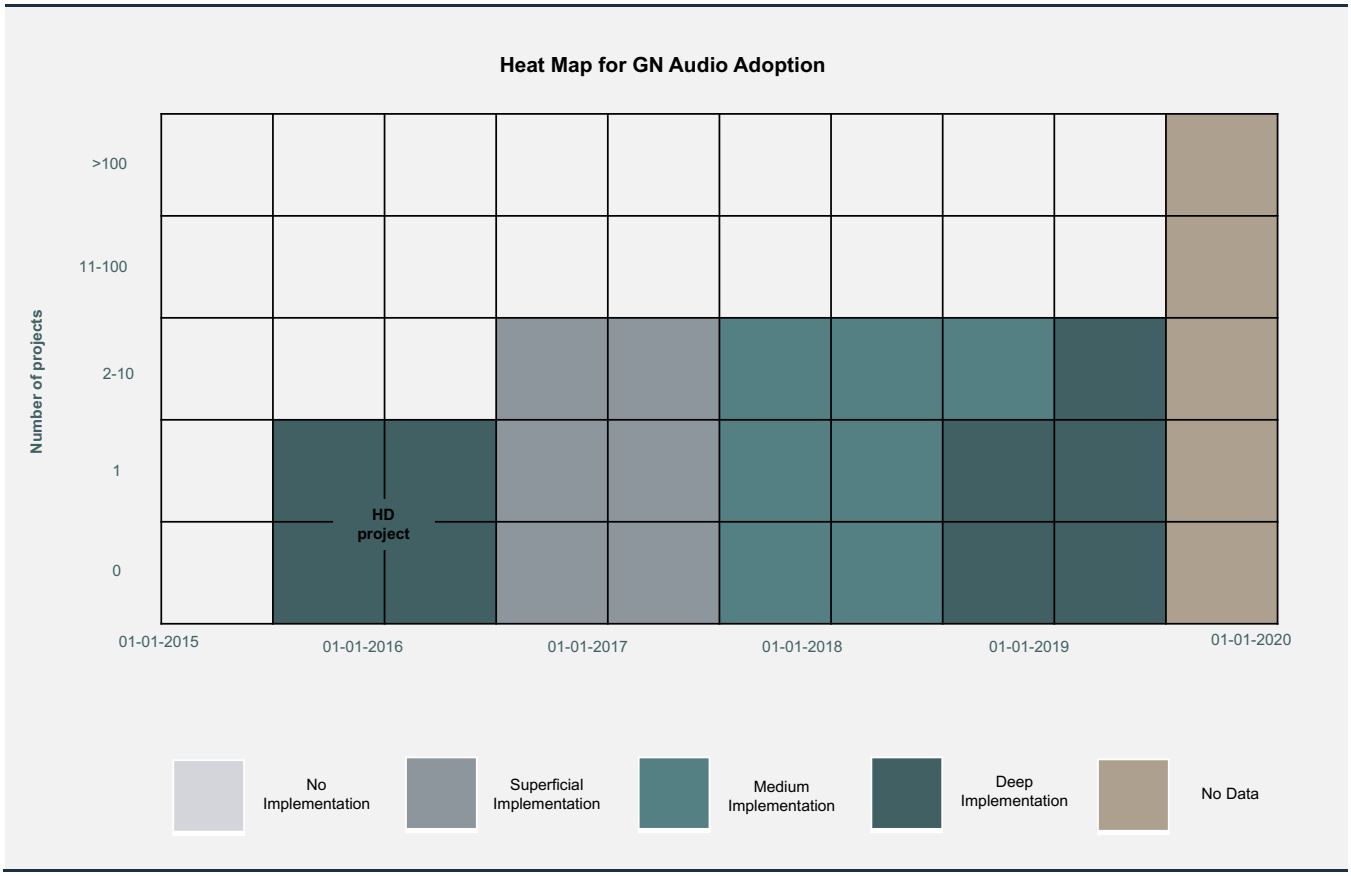


FIGURE 7.6: HEAT MAP OF HALF DOUBLE METHODOLOGY IMPLEMENTATION DEPTH IN GN AUDIO (AS OF NOVEMBER 2019)

The project noted as HD project in the Heat Map was executed in the department called “Retail & Online” in 2016, where the Global R&D department had their own HD project which was closed in 2019.

At the moment two projects are considered to have a deep implementation of the HDM and both were initiated after September 2019. There are two additional projects, which can be considered as either medium implementation or deep implementation. These two projects started implementing the HDM prior to September 2019 but continued after this date, which means that they did not have access to the full support function at the beginning of the project. Hence, these two projects are considered as being labeled as medium implementation prior to September

2019 and deep implementation after September 2019.

Furthermore, an additional nine projects can be characterized as having a superficial implementation of the HDM, as they were initiated prior to September 2019 and continue to use other project management methods until the projects end. Future projects will be initiated as HD projects. Summing up, there is a medium implementation in GN Audio, and they are on their way to deep implementation.

Experienced benefits and challenges from the adoption process

Officially there has been an announcement from the management that all projects in the Global R&D department must use the HDM. However, this announcement might not have reached all employees in the firm, and not all employees actually distinguish between the theories, methods or methodologies. Furthermore, some employees will always be reluctant to change and try to use alternative methods. Here, it should be noted that there have been challenges concerning having employees dedicated to individual project teams, especially in terms of constraint related to the demand of the individual employees' physical presence. The constraints can make it difficult to completely co-locate.

Different departments use different methods, which means that the concepting teams implemented the HDM for broad planning. But it was pre-defined that the fixed project groups had to use the HDM. This meant that the project managers had to make a Local Translation and adaption of the methodology themselves prior to September 2019.

The main focus for the concepting teams has been on the core elements; Flow and Impact. As milestone planning was already a part of their existing toolbox, the HDM contributed with an increased focus on sprint planning, where a fixed heartbeat was incorporated by using four-weeks sprints. The impact element has shown in the use of working with Impact Cases, which have seen great benefits from these sessions. They have found impact sessions, Kanban boards and stand-up meetings to bring high value. Furthermore, the dialogue-based planning has been useful for identifying interdependence between different departments.

For one of the projects, the Pulse Check has also been in focus. This included checking up on key performance indicators in collaboration with the PMO department and creating a fixed rhythm with daily and weekly meetups. On the other hand, implementing the core element, Leadership, has proven to be challenging, as it affects the entire organization, even in spite of an increased focus at the moment on collaboration and cooperation across departments.

The HDM has contributed with dialogue across projects, which helps increase discussions related to the portfolio management and how resources are best leveraged. However, they have not used prioritizing as the methodology prescribes. Furthermore, there are some political elements which are related to how the different areas prioritize, hence political crashes may occur. It should be noted that during one of the projects in the R&D department, the project organization did not have a project owner or a steering group, which meant that potential disagreements between the project manager and the program manager were sent directly to the vice president, which is different compared to the HDM.

It has come to our attention that it can be difficult to allocate +50% to Co-Location as there are multiple geographical locations and multiple departments with different project management methods. Besides, it has been a

challenge to define who is part of the core team and if they can be allocated according to HDM, when they are also key players in other projects. Experiencing these difficulties, GN Audio have learned, that they have to make Local Translation of the HDM match their current organizational structure and determine what makes sense for the individual projects. The HDM has provided a more holistic approach than the previous approach, hence they experience that fewer and fewer projects occur isolated in the Global R&D department.

The organization describes how it can be difficult to practice the HDM, as the HDM emphasizes adapting the methodology according to project and people, which according to the interviewees can be demanding as it requires alignment. The challenging part comes when the team members must avoid starting on vital project tasks before they have been examined by the project team. With less documentation, issues related to transparency may occur. Furthermore, it has been proven difficult to practice 'delivering minimum viable product', but they are working on improving this.

The PMO runs a monthly project review, where the fixed project teams report their progress by using a template. This template did not match with the HDM, e.g., as HD projects did not include contingency plans which is part of the template. Hence, the management has informed the PMO that HD projects are exempted from this part of the template.

It has been a challenge for the PMO department to determine how to keep close contact with the project managers and keep the feeling with the progress of the projects. The driving factor for this challenge can come from multiple sources, either from a change in the organization or changing from a stage-gate model to the HDM. There is a difference between the stage-gate model used in PMO and the agile approach used in the different departments. The question seems to be related to what PMO's role is in an HDM set up, and what it looks like in the future in the context of HD. So far, the PMO's role has been to spot when alignment is not fulfilled. Besides, it has been a challenge to figure out which role the PMO department should play in connecting different departments' project management methods. Here, it is important to recognize that GN Audio does not expect to have other project management methods in future than the HDM. The PMO is reporting to the R&D Mgmt. office, where it is likely that the multiple methods at the moment are a matter of getting into the new modus.

The implementation at the moment is considered as being medium to deep and is expected to be considered as deep implementation in future, as the HDM or the Local Translation of the methodology will be the working model across GN Audio's product making community.

7.4.4 Next step in GN Audio

The HDM is adopted in GN Audio, where adoption refers to the initial use of a new practice in an organization (Zeitz et al., 1999). Furthermore, the methodology is entrenched in GN Audio. The notion of entrenchment refers to embedded practices that are likely to endure and resist pressure for change (Zeitz et al., 1999). Education, culture, models, regulation, and technicalities play a role as indicators that drive either adoption or entrenchment (Zeitz et al., 1999). The focus moving forward in GN Audio is making the employees independent in the long run in relation to effectively practicing HDM. It has been experienced, though, that it is easy to train in HDM but harder to practice it in real life. GN Audio has expressed that it could be useful

to book external resources to help build up in-house knowledge to support entrenchment, as at the moment they have primarily been using internal resources.

GN Audio has conducted three internal surveys, where questions related to the HDM have been asked. It is clear that there is still some reluctance, but thoughts have been put forward to reconsider bringing their concept of having front runners for the methodology back up again. This is in line with Birkinshaw et al. (2008), who define management innovation as new management practices, processes, structures and techniques which are to further an organization's goals, where internal and external change agents play a role in a successful management innovation process. Notice that the results from the internal survey conducted by GN Audio could have been affected by employees being unable to comprehend the questions in the way they were intended, being unaware of the fact that the HDM is an actual methodology or that they use the HDM.

The theory of adoption says that the process of diffusion and adoption is influenced by technical, cultural and political factors (Ansari et al., 2010). In accordance with this, GN Audio is currently working on pushing decisions further down in the organization, with the intention of making the middle management more active seen in the context of the core element of Leadership. Furthermore, it has been proven difficult to practice 'delivering minimum viable product', but they are working on improving this.

The potential failure of using the HDM could come from subjects previously discussed, which are mainly related to allocation, Co-Location, and alignment of project management practices across departments. Experiencing these difficulties, learnings include adjusting the practices to match their current organizational structure and what makes sense for the individual projects. This aligns with Ansari et al. (2010) who suggest that diffusion evolves during the process of implementation and therefore requires adaptation to become meaningful in a specific organizational setting. A question related to this also seems to be what the PMO's role is in an HD set up, and what it will look like moving forward. The role of the PMO today is not to manage the projects in a traditional sense; instead, it is responsible for project budgets, follow-up on project spend, resource availability, portfolio, and planning overview.

Furthermore, there might be barriers to adoption related to the people aspect. GN Audio have expressed that they are aware that for employees to be supportive of the HDM, they must also consider the methodology as the best relative option for working together, as this affects their willingness to adopt the practices and take part in the process of implementing the methodology, which requires learning and continuous adaption.

7.5 Reflections on diffusion of the Half Double Methodology

We identify several differences when comparing the four different categories of implementation within which the 17 different organizations are presented.

What stands out when comparing the groups of no- and superficial implementation to the group of medium implementation is the use of internal and external change agents. The change agents (e.g., HDM trained employees or external consultants) have the purpose of training the organization, having the right materials and knowledge to implement the HDM; creating and nurturing the environment to increase the success rate of projects while increasing the development speed of new products and services. Furthermore, the

medium implementation group make management and employees open to new project management tools, having had success employing the HDM and believing in it. Therefore, they have the possibility to move further towards entrenchment of the HDM, i.e., a deep degree of implementation. However, it has further been established that organizations and project teams implement the HDM at different degrees depending on the project. This emphasizes the HDM aspect of Local Translation; that projects should be designed according to context rather than rigidly following the methodology. However, the organizations' different internal cultures are also seen to act as barriers when attempting to increase the scope of the HDM in each organization.

To summarize, what all findings show is that management innovation and diffusion are difficult and consist of several requirements by the organization and its people. Moreover, the findings in this chapter can be summarized in the following eight learning points for practitioners aiming to implement and diffuse the HDM.

1) Internal change agents are vital for the validation of the HDM. It becomes more difficult for the HDM to diffuse from department to department, and from employee to employee if the organization does not have the right people, knowledge and tools to successfully apply its management innovation (Abrahamson, 1996; Birkinshaw et al., 2008; Birkinshaw & Mol, 2006; Scarbrough et al., 2015).
2) Organizations should have their individual aspects in mind. Implementing and diffusing is a change process. This means understanding the internal environment and the cultural, technical and political factors that can act as both barriers and enablers to implementation and spread. For example, cases highlight the importance of management's openness and even awareness of the HDM. Thus, there is an aspect of governance and hierarchy in driving the diffusion process (Ansari et al., 2010; Zeitz et al., 1999).
3) Organizations should acknowledge Local Translation of HDM. This means examining the degree of implementation, or fidelity, i.e. how true the organization can be towards the HDM (Ansari et al., 2010). This emphasizes one of the core principles of HD, namely Local Translation, using practices or tools that work for the organization, staying true to the context rather than the exact methodology; matching organizational beliefs to the management innovations, and putting people before project models.
4) Working with Visual Planning is key. A key HDM practice for most organizations, from no implementation to medium implementation, has been the use of visual tools in their project management. This broad adoption can emphasize the advantages of the practice. (See Rode et al. (2018), for research on the role of visuals in PHD).
5) Pulse Check and Killing Complexity are useful. The practices of Killing Complexity and Pulse Check should also be highlighted as practices that stand out and are deemed useful for organizations and thus are enhanced in the diffusion process, potentially due to a high compatibility with organizations and employees (Zeitz et al., 1999).
6) Co-Location is challenging. Co-Location has been seen as a barrier to diffusion for some of the organizations (Birkinshaw &

Mol, 2006). However, it is also seen as a process for some; initially finding it challenging but later seeing it as a helpful and rewarding practice. Therefore, it can be necessary for organizations to remain dedicated to a challenging practice, albeit it may be difficult at first.

7) External change agents bring external validation. External change agents are what makes the group of medium implementation stand out from the other groups, having worked more closely with consultants. This emphasizes an organizational belief in the HDM and encourages organizations to invest time and money in additional teaching aid and in motivating their employees (Birkinshaw et al., 2008; Birkinshaw & Mol, 2006).
8) Labelling the HDM ways of working as HDM practices might drive entrenchment. A potentially helpful tool in the diffusion process could be to include HDM labelling as a focal point. By this we mean that certain HDM practices can also belong to other methodologies or best practices, and several insights point out that there is a lack of reference towards the practices as specifically HDM induced. A focus on labelling and emphasizing practices as part of the HDM could possibly drive the entrenchment further as it would increase employees' awareness of the HDM and not just best practices (Zeitz et al., 1999).

Again, it is relevant to highlight the fact that two of the 17 organizations showed the HDM being capable of diffusing across from one organization to another. This can indicate the early beginning of the HDM becoming a new norm or fashion (Abrahamson, 1996). Thus, as the HDM is shared with more organizations, this notion of management fashion by Abrahamson (1996) can potentially be further emphasized, and the HDM can move towards stable institutionalization (Lawrence et al., 2001; Vitharana & Dharwadkar, 2007). This underlines the indication that the HDM evolves towards becoming a legitimate project management methodology in Denmark.

The purpose of this chapter was to examine and understand the diffusion of the HDM in 17 different organizations. The study shows that the HDM has been able to maintain itself in many of the organizations after the HD projects finished. However, the study also emphasizes the difficulty of sharing and spreading the HDM to other project teams and departments. Here, it was emphasized that three types of change agents play fundamental roles in both maintaining and spreading this diffusion: 1) external change agents in the form of consultants, and internal change agents in the form of motivated 2) top management and 3) employees.

8 Half Double projects in small and medium enterprises

By Anne Jensby and Anna Le Gerstrøm Rode (Aarhus University)

This chapter focuses on a special segment of the organizations participating in Project Half Double (PHD), namely the small and medium enterprises (SMEs).

Research suggests that SMEs differ from large enterprises in relation to their projects and application of project management methodologies and practices (Turner & Ledwith, 2018; Turner, Ledwith, & Kelly, 2009, 2010, 2012). Further, SMEs play an important role in the Danish business landscape, as 99% of the Danish enterprises can be defined as within this category (Vestgaard et al., 2018). Therefore, it is relevant to examine how this segment can utilize the HDM (HDM).

This chapter will be structured as follows. First, we will take a theoretical perspective on SMEs introducing research on SMEs and project management. Second, we take an empirical perspective on nine HD projects in eight SMEs partaking in phase 1, 2 or 3 of PHD. We begin with a focus on project characteristics in SME settings. Then we present a success and performance evaluation of HD projects in SMEs. This will be followed up by a description of learnings from working with the HDM in three SMEs. This is followed by an in-depth illustrative case study of HDM in a medium enterprise. Lastly, the chapter concludes with three attention points for implementing HDM in SMEs.

8.1 Literature on project management in small and medium enterprises

SMEs are of high importance as they make key contributions to the economy both in relation to employment and growth but also with regard to business development and innovation (Turner et al., 2010; Vestgaard et al., 2018). Projects are widely used in SMEs, and research suggests that SMEs' approach to project management is less formal and simpler compared to large enterprises (Turner et al., 2012). This further emphasizes the importance of investigating HDM in this large segment of businesses in Denmark.

8.1.1 Defining small and medium enterprises

Our definition of SMEs draws on a previous PHD report focusing on SMEs as a specific segment of special interest (Rode et al., 2018). From our previous work we learn that there are various understandings of the SME term, but no standard international definition of SMEs (OECD, 2017, p. 13). However, a very common definition used in EU and Denmark is from the European Commision (2018). We have decided to extend this EU definition as shown in table 8.

COMPANY CATEGORY	STAFF HEADCOUNT	TURNOVER *OR*	BALANCE SHEET
Large-medium	< 1000	Not decided	Not decided
Medium	< 250	≤ € 50 m	≤ € 43 m
Small	< 50	≤ € 10 m	≤ € 10 m
Micro	< 10	≤ € 2 m	≤ € 2 m

TABLE 8.1: CLASSIFICATION OF SMALL AND MEDIUM ENTERPRISES (ADAPTED FROM THE EUROPEAN COMMISSION, 2018)

In our operationalization of the SME term, we exclude financial numbers and include the large-medium term, which means that we regard organizations with less than 1.000 employees as part of the SME segment.

Note that the staff headcount of the new PHD phase 3 organizations is fixed at the time of their enrolment in PHD. The headcounts of the HD project SMEs are based on company interviews and documents including company websites as well as Denmark's Central Business Register (CVR) database. It should also be noted that the organizations can grow in size after their enrolment in PHD and that such development does not exclude them from the SME segment in PHD.

8.1.2 Managing projects in small and medium enterprises

A great part of the SME and project management body of literature stems from Turner and colleagues (Turner & Ledwith, 2018; Turner et al., 2009, 2010, 2012). For instance, they find that it is age rather than the size of the SME that predominantly decides the extent to which projects are used, meaning that older and mature companies are more likely to use projects and have project managers employed (Turner et al., 2012). Therefore, they argue that smaller and younger firms are more likely to require a simple, less formal, generalist, and more people-centered project management form, whereas medium to larger enterprises use a more bureaucratic and formal approach to project management and use teams and specialists (Turner et al., 2012). At the same time, it is found that smaller companies prefer trusted techniques because their projects have a higher risk of failure (Turner et al., 2009). Turner et al. (2010) find that SMEs use project management both for operations, and to manage their growth and innovation. Further, taking their point of departure in Ghobadian and Gallear (1997), Turner et al. (2010) emphasize that traditional project management fails to deliver processes, procedures, structure, and people-focus for SMEs, as traditional project management processes and procedures are often formal, bureaucratic and specialized, based on a functional structure, and focused on systems rather than people. This is argued to be contrary to the needs of SMEs which require simple and informal processes, little standardization and specialization, which is focused on people and based on multitasking and innovativeness (Turner et al., 2010). Turner and Ledwith (2018) examined barriers for SMEs to using project management, finding that high scoring barriers relate to (1) people not knowing what project management is about, (2), engineers thinking outcomes can be achieved based on technical excellence only, and (3) that project management is too bureaucratic for SMEs and their generally smaller-sized projects, and reduced flexibility.

Recently, Vestgaard et al. (2018) investigated 37 SMEs across Denmark and their approach to projects and project management. They found considerable diversity in the SMEs' approach to both projects, project management, and project work. This is partly explained by the fact that most project owners and managers are unaware of this field's self-understanding, and also its models and tools. Further, they argue that the use of project work is not necessarily systematic or based on informed choice, but instead on common sense and a gut feeling. At the same time, this approach to projects is found to be successful and leads to results in the SMEs (Vestgaard et al., 2018). In addition, they conclude that SMEs differ in their project work preference, from management and control based to a leadership and entrepreneurial approach. According to Vestgaard et al. (2018), the use of project work should be guided by people,

meaning that projects are a social practice defined by situation and context, and therefore project work should be flexible and based on simple project models and practices.

To sum up the research above, SMEs would benefit from a project management methodology being (1) simple and informal but trusted (2) flexible, (3) people-centric, and for generalists rather than specialists. Further, SMEs can be challenged by a lack of awareness or understanding of project management.

8.2 The Half Double Methodology in small and medium enterprises

Based on our operationalization of SMEs defined as organizations with less than 1,000 employees, we can outline eight official SME organizations having employed the HDM in nine HD projects altogether. The SMEs are Lantmännen Schulstad, Hydratech Industries, Fiberline, Schoeller Plast, GlobalConnect, Malmos, Bila, and AJ Vaccines. Due to this chapter only consisting of eight organizations, this chapter and its findings must also be read and understood with precaution.

All SME organizations and their HD projects are outlined in table 8.2.

PHD PHASE	#	ORGANIZATION	EMPLOYEES	SIZE CLASSIFICATION	#	PROJECT TYPE
One	1	Lantmännen Schulstad	612[1]	Large-medium	1	Business development
Two	2	Hydratech Industries	500	Large-medium	2	Production transfer
Two	3	Fiberline	290	Large-medium	3	Process optimization
Two	4	Schoeller Plast	42	Small	4	Process optimization
Three	5	GlobalConnect	800	Large-medium	5	Information technology
Three	6	Malmos	100[1]	Medium	6	Landscaping
					7	Landscaping
Three	7	Bila	249	Medium	8	Process optimization
Three	8	AJ Vaccines	705[1]	Large-medium	9	Information technology

[1]The SME is part of a larger organization.

TABLE 8.2: SMALL AND MEDIUM ENTERPRISES AND HALF DOUBLE PROJECTS

The table shows one small organization, two medium organizations and five large-medium organizations.

After a presentation of each of the eight organizations in the sub-sections below follows an evaluation of the performance and success rate of the nine projects as well as project characteristics of the eight SMEs, and finally, HDM practices applied in the nine HD projects. It should be noted that the number of SMEs and SME projects are low and hence, generalizations are made with caution.

1) Lantmännen Schulstad is a part of Lantmännen Unibake in the food industry. On its own, it consisted of 612 employees at the time of their HDM initiation, qualifying as a large-medium organization. Their HD project kicked off in August 2015 with a duration of approximately seven months. The project concerned commercial concept development, developing a new range of bread and pastries for one of its store customers. The project's main purpose centered on creating a new business model adding value for the parties involved with a new in-store concept and with closer relations built with the customer.

Therefore, the project vision was to become the customer's preferred supplier within this concept type. The project's duration of seven months was a significant reduction of the average project lead time of 12-14 months. Furthermore, the project's impact was compared to two reference projects with the HD project performing the highest. Finally, the project reached most of its success criteria. The project is further described in Rode et al. (2019), Rode et al. (2018) and Svejvig, Rode, et al. (2017).

2) Hydratech Industries is an enterprise in the hydraulic components industry and consisted of 500 employees at the time of their HDM initiation, enabling us to categorize it as a large-medium organization. The HD project was initiated in February 2018 and finished in October 2019. The purpose of the project was to transfer an assembly facility from Denmark to the Czech Republic thereby reducing costs from assembly production. The firm emphasized that the HDM was easy to adopt and simple to use. It was the firm's first production transfer project, and they had no similar projects to which we could compare the HD project; therefore, the project's relative performance could not be evaluated. In terms of its success rate, it reached most of its success criteria. The project is further described in Rode et al. (2018) and Rode et al. (2019).

3) Fiberline was comprised of 290 employees at the time of their HDM initiation, making them a large-medium organization in the components industry of glass and carbon fiber. Their HD project concerned process optimization and aimed at increasing the quality and throughput of carbon fiber profiles, keeping up with increased market demands. The project was initiated in December 2017 and finished in June 2018, having fulfilled its success criteria to a medium degree. The project's performance was compared to two reference projects, with the HD project performing lower than the two comparable projects. The project is further described in Rode et al. (2018) and Rode et al. (2019).

4) Schoeller Plast is an enterprise in the plastic components industry and consisted of 42 employees at the time of their HDM initiation, qualifying as a small enterprise according to our SME categorization. Their HD project was a process optimization project enabling sales and development to calculate true costs and establishing a baseline in production to start building true performance management capabilities. The project was initiated in March 2018 and was expected to finish in May 2019. The project fulfilled its success criteria to a medium degree. In terms of its relative performance, it is compared to a similar reference project with a lower impact but also a lower speed: hence, the HD project's relative performance is medium. The project is further described in Rode et al. (2018) and Rode et al. (2019).

5) GlobalConnect is in the telecom industry and consisted of 800 employees at the time of HDM initiation, categorizing as a large-medium enterprise according to our SME classification. In July 2019, they initiated their HD project to deliver a common IT service management system between the department in Norway and Denmark. The project was a reestablishment of a terminated project. The project was completed in October 2020. The project reached all its success criteria and was perceived as a success with a thorough implementation of the HDM. There is no data on similar reference projects and therefore the project's relative performance is not evaluated.

6) Malmos is an enterprise in the construction and landscaping industry and consisted of approximately 100 employees at the time of

their HDM initiation, qualifying them as a medium-sized enterprise. Malmos has two HD projects using the HDM. The first HD project was initiated in January 2018 and was completed in August 2019. It concerned an artificial ski slope on a sloped rooftop of a building. For the firm, the project was regarded as highly complex, challenging, innovative, and groundbreaking, but also considered a success. A second HD project was initiated in January 2020 and finished in November 2020, which concerned landscaping a residential area. This project was also regarded as a success for the firm. HD project 1's relative performance is categorized as medium. HD project 2's relative performance is higher.

7) Bila is an engineering company focusing on robot automatization solutions. They consisted of approximately 249 employees at the time of their HDM initiation, qualifying as a medium enterprise. Bila initiated their HDM journey in 2017 when they delivered a robot solution to a customer who implemented the HDM. Based on the positive results and experiences from this initial trial, Bila implemented the HDM in their organization and in projects with other customers. The HD project evaluated in this report was initiated in October 2018 and finished in August 2019. At the time of writing, data was not available on project results.

8) AJ Vaccines is a company within biotechnology and pharmaceuticals producing vaccines. They had 705 employees when they began their HDM implementation, qualifying as a large-medium enterprise. Their HD project was within the IT department, developing an app to optimize logbook use at production support, moving logbooks from being manual to being digital, enabling technicians to better utilize their time. The project was initiated in June 2020 and expected completion between December 2020 and January 2021. At the time of writing, it is too early to conclude on the results of the project.

8.2.1 Project results in small and medium enterprises

All HD projects have been evaluated based on absolute success in terms of success criteria fulfillment. In addition, most HD projects have been evaluated based on relative performance in comparison with similar reference projects. The operationalization of these two evaluations are summarized below and further elaborated upon in chapter 4 presenting the evaluation of all HD projects.

The absolute success evaluation is operationalized into three levels:

- **High success rate:** all or above 67% of the success criteria are fulfilled
- **Medium success rate:** between 34% and 66% of the success criteria are fulfilled
- **Low success rate:** none or less than 33% of the success criteria are fulfilled

The relative performance evaluation is operationalized into three levels:

- **Higher performance:** the HD project is completed faster and with higher impact than all the comparable reference projects.
- **Medium performance:** the HD project is completed at approximately the same speed and with approximately the same impact compared to the reference projects.
- **Lower performance:** the HD project is completed slower and with lower impact than all the comparable reference projects.

After examining the eight SMEs, we have sufficient data to conclude on the success rate of six of the organizations and seven HD projects lacking data on two organizations.

The results of the HD project performance and success evaluations within these six organizations and seven projects are summarized in table 8.3 and visualized in figure 8.1.

#	PROJECT	PERFORMANCE	SUCCESS	ORGANIZATION	CLASSIFICATION
1	Business development	Higher	High	Lantmännen Schulstad	Large-medium
2	Production transfer	No data	High	Hydratech Industries	Large-medium
3	Process optimization	Lower	Medium	Fiberline	Large-medium
4	Process optimization	Medium	Medium	Schoeller Plast	Small
5	Information technology	No data	High	GlobalConnect	Large-medium
6	Landscaping	Medium	High	Malmos	Medium
7	Landscaping	Higher	High		
8	Process optimization	No data	No data	Bila	Medium
9	Information technology	No data	No data	AJ Vaccines	Large-medium

TABLE 8.3: SMALL AND MEDIUM ENTERPRISES AND HALF DOUBLE PROJECT RESULTS

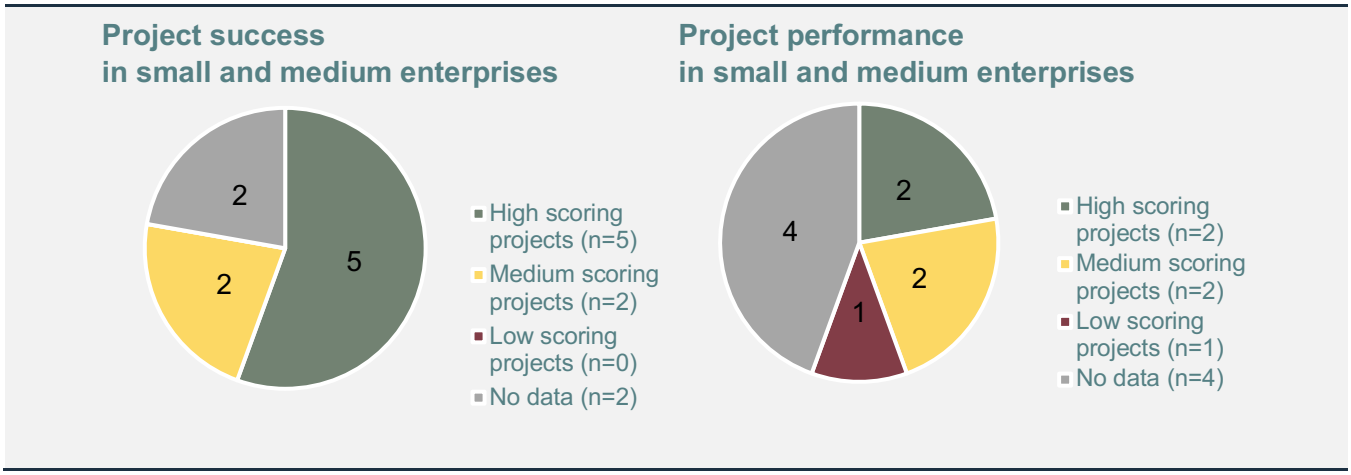


FIGURE 8.1: SMALL AND MEDIUM ENTERPRISES' HALF DOUBLE PROJECT SUCCESS AND PERFORMANCE

As the first diagram to the left illustrates, five of the nine SME HD projects have a high success rate, and two have a medium success rate. None of the projects have a low success rate.

As the second diagram to the right illustrates, two of the five HD projects with sufficient data have a higher performance, two have a medium performance, and one has a lower performance compared to similar reference projects. Overall, the results of the success and performance evaluations of SME HD projects mirror the general evaluation of all HD projects presented in chapter 4 suggesting the HDM is not less applicable in the SME segment.

8.2.2 Project characteristics in small and medium enterprises

As a part of PHD's phase 3, we investigate HD organization's general approach to projects by means of duration, number of employees, and cost in euros. These characteristics are listed in table 8.4.

CHARACTERISTIC	MIN	MAX
DURATION (MONTHS)	4	27
RESOURCES (EMPLOYEES)	4.75	19
COST (EUROS)	180,000	11,260,000

Note that intervals are based on four SMEs as data are only available from SMEs partaking in phase 3 of PHD.

TABLE 8.4: TYPICAL PROJECT CHARACTERISTIC INTERVALS IN SMALL AND MEDIUM ENTERPRISES

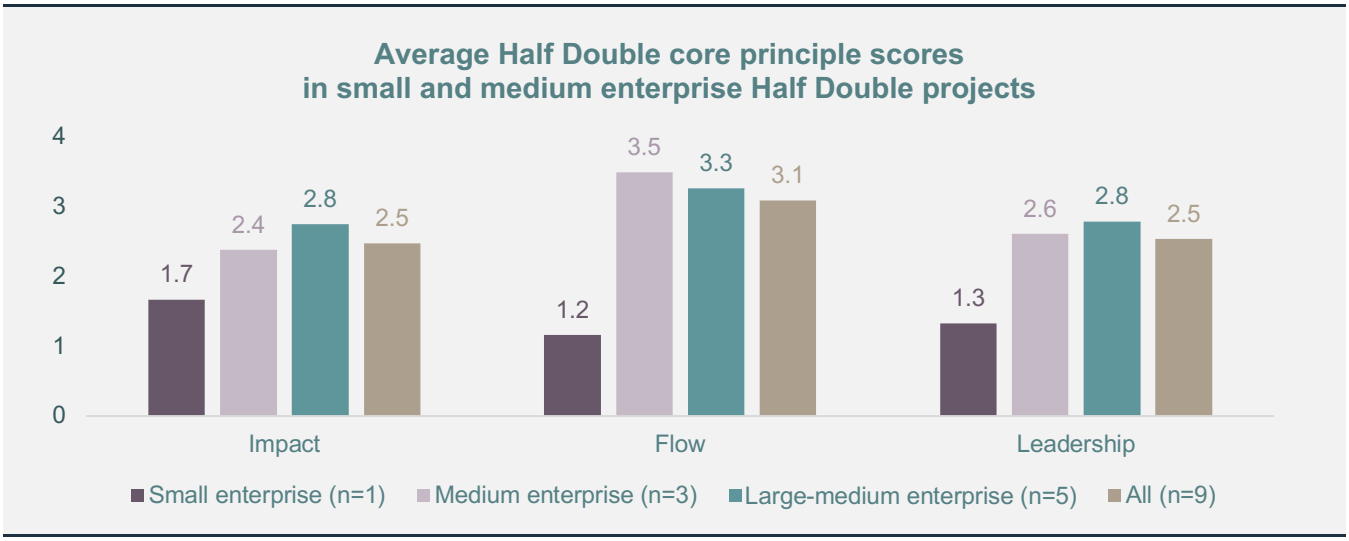
As the table shows, the SMEs undertake a wide range of projects from small projects of four months and 4.75 employees, to large projects with an average of 19 employees and more than 10 million euros.

8.2.3 Project practices in small and medium enterprises

As a part of PHD, each HD project is scored according to its application of the HDM practices. Scores are given from low usage (1) to high usage (4).

For the sake of simplicity, we operationalize the scores into two groups. Scores below 2.5 we consider relatively low. Scores above 2.5 we consider relatively high.

Figure 8.2 illustrates the HD projects' average scores of the three principles of the HDM: Impact, Flow, and Leadership. In addition, the nine HD projects are grouped according to our SME classifications of small, medium, and large-medium.



n refers to number of HD projects.

FIGURE 8.2: AVERAGE SCORES OF HALF DOUBLE CORE PRINCIPLES IN SMALL AND MEDIUM ENTERPRISE PROJECTS

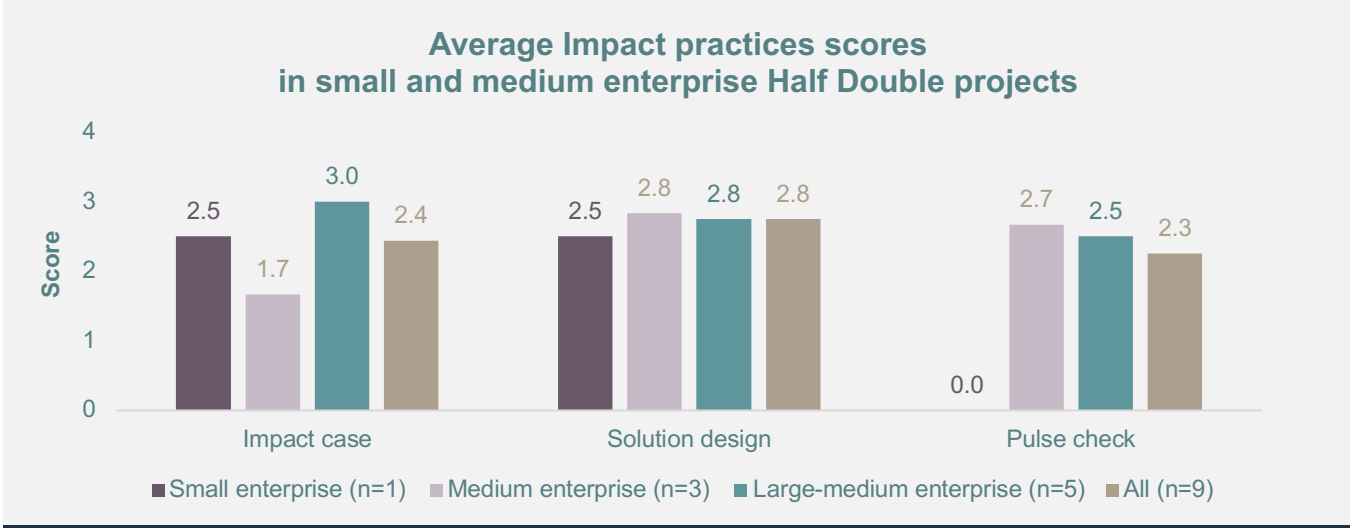
As the figure illustrates, in the small organization's HD project, the practices of the HDM were not employed thoroughly. The opposite is the case for the organizations categorized as medium and large-medium which projects that all score high on all three principles except for medium enterprises scoring a little lower in average on impact.

The scorings seem to suggest that the HDM is implemented relatively well in medium and medium-large organizations.

Below, SME scores of the three practices within each of the three principles are presented.

Impact practices in SME projects

Figure 8.3 shows the evaluation of the three practices related to the principle of Impact: (1) Impact Case, (2) Impact Solution Design, and (3) Pulse Check.



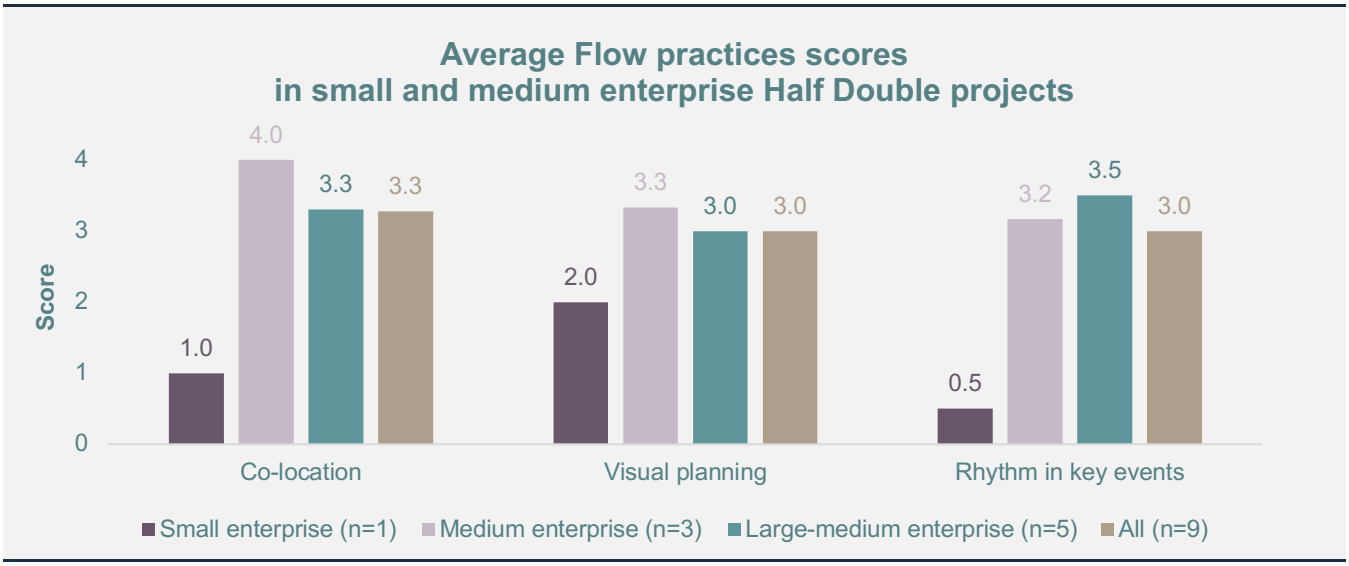
n refers to number of HD projects.

FIGURE 8.3: AVERAGE SCORES OF IMPACT PRACTICES IN SMALL AND MEDIUM ENTERPRISE HALF DOUBLE PROJECTS

Overall, all SME categories score high on all impact practices except for two: medium enterprises' projects score low on Impact Case and the small enterprise is not using the Pulse Check at all. For Impact Solution Design in specific, the scores are similar across all HD projects except for the small enterprise scoring slightly lower relative to medium and large-medium organizations.

Flow practices in SME HD projects

Figure 8.4 shows the evaluation of the three practices related to the principle of Flow: (1) Co-Location, (2) Visual Planning, and (3) Rhythm in Key Events.



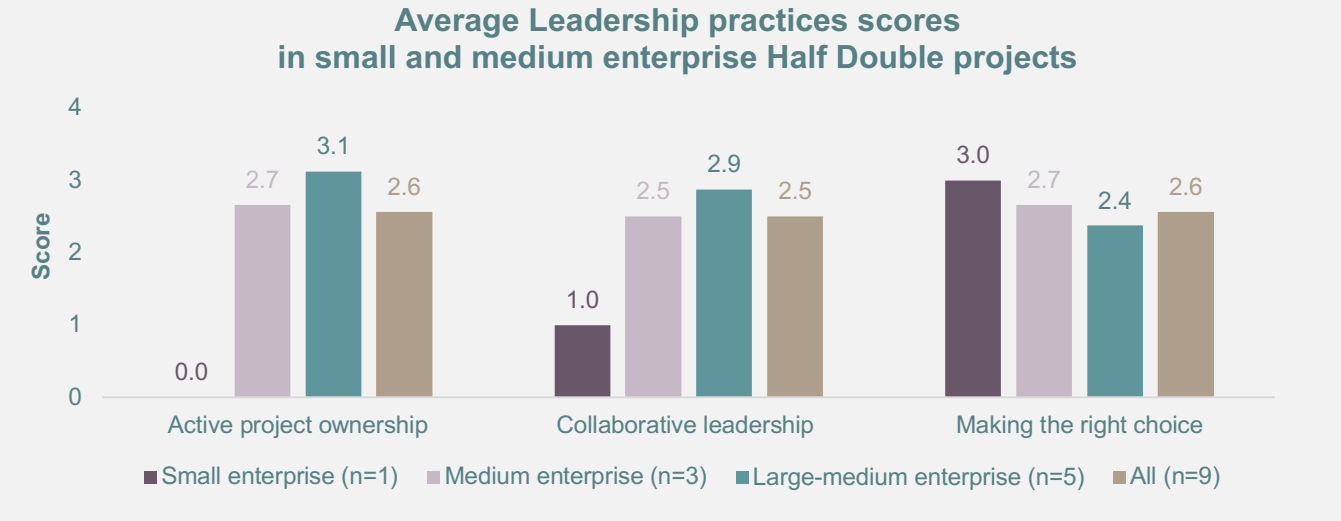
n refers to number of HD projects.

FIGURE 8.4: AVERAGE SCORES OF FLOW PRACTICES IN SMALL AND MEDIUM ENTERPRISE HALF DOUBLE PROJECTS

On average, all practices score high across medium and large-medium organizations' HD projects. The small organization's HD project scores are low on all three practices but highest on Visual Planning.

Leadership practices in SME HD projects

Figure 8.5 shows the evaluation of the three practices related to the principle of Leadership: (1) Active Project Ownership, (2) Collaborative Leadership, and (3) Reflective and Adaptive Mindset.



n refers to number of HD projects.

FIGURE 8.5: AVERAGE SCORES OF LEADERSHIP PRACTICES IN SMALL AND MEDIUM ENTERPRISE HALF DOUBLE PROJECTS

The projects' average in all organizations is high in regard to all three Leadership practices. In general, all three SME categories score high on all three Leadership practices except for three cases: the small organization using Collaborative Leadership only a little in their project and not using Active Project Ownership at all. Also, the five large-medium organizations' projects on average score a little low on the third practice: Reflective and Adaptive Mindset.

All HDM practices in SME HD projects

Looking solely at all practice scores for each SME segment we see a diversified picture.

The small organization's project scores low on all practices but (1) building an Impact Case, (2) developing an Impact Solution Design, and (3) Reflective and Adaptive Mindset which score extremely high. This high score signifies that the project manager has adopted the HDM to meet the specifics of the HD project and its context to a very high degree: hence, the many low HDM practice scores is partly explained by the high customization score.

The medium organizations' three projects all score high on average across all practices except Impact Case which scores relatively low. The highest scores are given to the practices of (1) Co-Location, (2) Rhythm in Key Events, and (3) Visual Planning. In general, the high HD project scores indicate that the HDM is applicable within these medium organizations.

The large-medium organizations' five projects all score high on average across all practices but 1) Reflective and Adaptive Mindset. The highest scores are given to the practices of (1) Impact Case (2) Impact Solution Design, (3) Co-Location, (4) Visual Planning, (5) Active Project Ownership. Across the three principles, the large-medium HD projects score is the highest in two out of three. Together, these scores suggest the opposite of the small organization: that the customization of the HDM is low because the methodology seems to fit and be applicable as is within the context of these larger organizations.

8.2.4 Evaluating projects in small and medium enterprises

As a part of PHD phase 3, four of the most recent SMEs have been evaluated in terms of the initial motives for initiating the PHD journey as well as the subsequent learnings from working with the HDM.

This evaluation is based on individual qualitative interviews with SME representatives ranging from project manager to head of PMO and CEO. Questions are both inductive and deductive, the latter being based on evaluation assessments by Chen (2015) and Wholey (1987), focusing on five areas of (1) practicality, (2) affordability, (3) suitability, (4) evaluability, and (5) helpfulness.

Reasons for initiating HDM in SMEs

The evaluation of the motives underlying the reason for initiating the HDM journey in the four most recent SME implementations is explicated below.

Malmos initiated the HDM based on a realization of insufficient project management performance, and the need to develop and strengthen project management for the firm to maintain their competitive position in a future characterized by more complex projects. Malmos found that in other project management methodologies there was an absence of a focus on effect, purpose, knowledge sharing, and customer value, and a focus on technical deliverables.

GlobalConnect found the HDM more appealing and simpler compared to other project management methodologies,

providing better governance and management of projects whilst developing and maintaining a collaborative culture in a young organization. Further, it is argued that the HDM enables an efficient momentum.

Bila starts using the HDM in a joint project with one of their customers. Based on this project and driven by experienced benefits and effectiveness realized from the HDM, Bila decided to implement the HDM in other projects with other customers.

AJ Vaccines is motivated to implement the HDM in order to become better at understanding the value of projects. The HDM was discovered by their project management office (PMO). Prior to their HDM initiation, they did not have a uniform project model, but instead approached projects based on the practices utilized by the project manager as well as a stage-gate model and compliance required in the industry.

Experiences from working with the HDM in SMEs

The evaluation of the learnings and experienced effect of working with the HDM in the most recent SMEs are divided into challenges and opportunities and explicated below.

Opportunities for SMEs engaging with the HDM are multiple. Overall, informants mention several positive results and learning opportunities from implementing the HDM – both culturally and financially.

In terms of financial benefits, the head of PMO in one organization states: "*We have started delivering. […] Before, projects were constantly pushed. No projects were delivered on time."*. In a second organization, they expected an improvement along their contribution margin from adopting the HDM but have not yet been able to identify one. Although the project manager here argues that *"the noise that comes from other factors (e.g., iterations in software) is so substantial that we cannot see the impact that may come from Half Double"* on the bottom line.

Related to cultural results, in one organization it is emphasized that they are becoming more professional in their projects, as *"previously, we had an organization that was anti standards, certifications […] that we can do better ourselves".* They also emphasize that the HDM has *"strengthened our collaboration in large complex projects".* Further *"it has given the project manager a greater possibility to govern and control projects",* based on Pulse Checks and Flow. Simplicity is considered a strength of the HDM as it makes it easy to communicate and implement. In one SME, the project manager states: *"it does not take very long, then people are on the bandwagon, and fortunately we had a management that said "well we have to do it" ".*

The head of PMO in one SME emphasizes: *"Half Double is better at expressing what it takes and making it simple for the population you are working with"* and that *"it has proven to be the greatest quality by Half Double, that it's easy to explain, and if you follow it stepwise you will be in a better state in an immature organization".* At the same time, the same organization is challenged by the simplicity, as it can be perceived by employees as self-explanatory, and therefore risk not being followed correctly without leadership. Further, it can also be too simple when explained to top management. The benefits from simplicity are also emphasized by another SME, with the CEO stating: "*The Half Double message has been really easy to communicate",* and that *"for us, Half Double was the lever for something we knew well in advance".*

Challenges for SMEs engaging with the HDM exist. Notwithstanding the opportunities of the HDM in SMEs, we also learned that implementation of the HDM can be challenging.

An important learning is that the HDM implementation in the SMEs requires help from consultants. In one organization the project manager states: *"We would never have been able to do it ourselves because we had to learn a new way of thinking, and if we had tried to do it ourselves, we would have made some kind of pseudo-implementation".* This is supported by another SME*: "I would have made some misinterpretations in the framework itself; I would form my own position on what it meant, and I think that is dangerous"*. From the informant in a third organization, it is stated: *"the people around HD have really made a difference".* This suggests that the implementation of the HDM is difficult in an SME, although its framework is simple to convey, and top management is on board.

8.2.5 Learning from Half Double in small and medium enterprises

The empirical HDM evaluation explicated above can be reflected in the extant literature on project management and methodologies in SMEs introduced in the beginning of this chapter.

Central both in the motives and learning evaluations is the reported advantage of the simplicity of the HDM. The simplicity is a benefit in terms of communicating the methodology, educating the employees, and motivating their use of it. This finding is mirrored in the findings of Turner et al. (2012), Turner and Ledwith (2018), and Vestgaard et al. (2018) emphasizing that smaller firms require a more people-centered and simple form of project management compared to larger organizations.

Further, it is indicated that employees straightforwardly involve themselves, are loyal to what they are conveyed and the added professionalism the HDM brings to their projects. This suggests that the HDM is suitable for informal generalists and not only specialists, which is a characteristic important for SMEs (Turner et al., 2010, 2012).

However, the Half Double medicine does not fix all challenges that the SMEs are exposed to, for instance when projects become delayed due to external contingencies. Lastly, we learn of the important role that consultancy plays for SMEs when implementing the HDM in terms of conveying what it is about, and increasing awareness (Turner & Ledwith, 2018; Vestgaard et al., 2018) as well as trust in techniques (Turner et al., 2009).

8.3 Exploring the Half Double Methodology in Malmos

The following subsection serves as an illustrative example of how the HDM looks in Malmos, one of the eight SMEs. The objective of the case study is to gain in-depth insights into the HDM journey and implementation of the methodology in a medium sized organization.

8.3.1 Presenting a medium enterprise setting

Malmos is a leading Danish landscaping firm located in Roskilde and established in 1953. The firm consists of approximately 100 employees who generate an annual revenue of circa €26,885,000 (year 2018). Thus, Malmos qualifies as a medium-sized organization. Furthermore, the organization can be considered as project-based, undertaking 375 projects on an annual basis.

Malmos does some of the biggest landscaping projects in Denmark and mainly the eastern part with few projects made in Sweden as well. They have competitors working on similar projects, with two defined as proportionally similar to Malmos.

Their projects are both defined as small, medium, and large, all with the purpose of creating a good sustainable environment for Danes both in nature, cities, and residential areas. Further, Malmos is specialized in creating complex solutions in terms of sustainable draining systems as well as green living roofs and decks.

In early 2020, Malmos was acquired by Idverde, Europe's largest provider of landscaping, contracting, and maintenance services, spanning across six countries and with 7,500 employees, headquartered in France, and generating annual revenues of €800 million (2020). Malmos keeps its original name, structure, and management functioning as a subsidiary of Idverde. In late 2020, Idverde Denmark acquired OKNygaard, one of Malmos' competitors in Denmark headquartered near Aarhus, which also will remain a separate subsidiary.

Investigating Malmos as its own entity, the **key numbers** are:

- Headquartered in Roskilde, Denmark
- Established in 1953
- A workforce of 100 employees
- Turnover of €26,885,000 in 2018
- Annually, 5-10% of turnover is spent on internal projects
- Acquired by Idverde in 2020
- Idverde operates in France, The United Kingdom, The Netherlands, and Denmark

8.3.2 Presenting two Half Double projects

We have investigated two HD projects in Malmos.

The first HD project (pilot project 1) is titled Copenhill and is a landscaping project to cover a 16,000m^2 park surrounding Amager Bakke in Copenhagen, a combined heat and power waste-to-energy plant. The project includes developing an artificial ski slope on the roof, a hiking slope, and a climbing wall. The project was regarded as complex and groundbreaking for the firm, using methods and technologies in new ways to create an innovative outdoor environment. The project was initiated in January 2018 and finished in August 2019, and it was Malmos' first HD project.

The second HD project (pilot project 2) is titled Skovbrynet Basecamp and is a landscaping project covering a new residential area in Lyngby north of Copenhagen. The residential areas were developed both for students, seniors, and the municipality. For Malmos, this entailed developing green living roofs and a green outdoor area, park, and terrain. This project was initiated in January 2020 and completed in November 2020, and thus was built upon knowledge and experience with the HDM from HD project 1. As of Q4 2020, the project has won 13 awards including best construction.

8.3.3 Comparing Half Double projects

Malmos' HD projects have been evaluated based on a comparison with two reference projects. The basic idea of the comparison is to evaluate in practical terms to which extent the HD projects perform better (or worse) than the reference projects.

Although most projects show unique characteristics, there are similarities across projects. This fact is used in our comparison where we asked for two reference projects,

which are as similar to the HD project as possible.

Table 8.4 summarizes the projects' individual scales in terms of size measured by working hours and costs as well as characteristics in terms of novelty, pace, and technology (Shenhar & Dvir, 2007) and complexity (Fangel, 2005). The composite score is a relative score derived by summarizing and comparing information from all proxies. The composite scorings show that overall, HD project 1 is considered the largest and most comprehensive project, and reference project 2 is considered the smallest and simplest project.

However, when looking only at resources and costs in the four projects, HD project 2 is the smallest, and reference projects 1 and 2 are the largest. Nevertheless, looking at project characteristics operationalized as technological uncertainty, novelty, pace, and complexity, the HD projects are more difficult and critical than the reference projects.

PROJECT SIZE AND SCALE COMPARISON	HALF DOUBLE PROJECT 1	HALF DOUBLE PROJECT 2	REFERENCE PROJECT 1	REFERENCE PROJECT 2
RESOURCES (HRS)	17,500	10,717	23,800	14,200
COST (EURO)	4,035,000	2,660,000	4,045,000	7,030,000
CHARACTERISTICS (Shenhar & Dvir, 2007)	9.83	8.04	6.08	7.25
COMPLEXITY (Fangel, 2005)	2.33	2.04	2.08	1.75
COMPOSITE	1	2	3	4

TABLE 8.4: SIZE AND SCALE OF HALF DOUBLE PROJECTS AND REFERENCE PROJECTS IN MALMOS

8.3.4 Evaluating project performance

The two HD projects are also compared to the two reference projects to establish their relative performance - in terms of time and impact.

Figure 8.5 shows the projects' relative duration counted in days and illustrated in weeks.

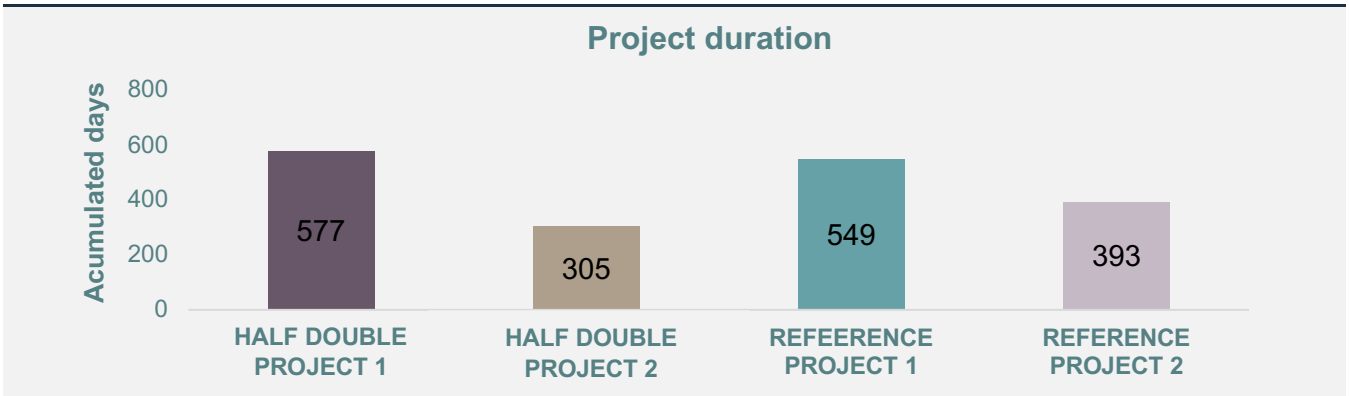


FIGURE 8.5: PROJECT DURATION

HD project 1 and reference project 1 are comparable in terms of duration, being the longest projects, whereas HD project 2 is the shortest.

The projects' impact is operationalized into an indicator of their contribution which is based on a contribution margin. In figure 8.6, the graph illustrates each HD project and reference project in terms of budgeted contribution, and a realized contribution. In addition, we have added the duration of each project to the graph. The actual contribution margins have been excluded and instead translated into an interval of 0 (=low) to 100 (=high).

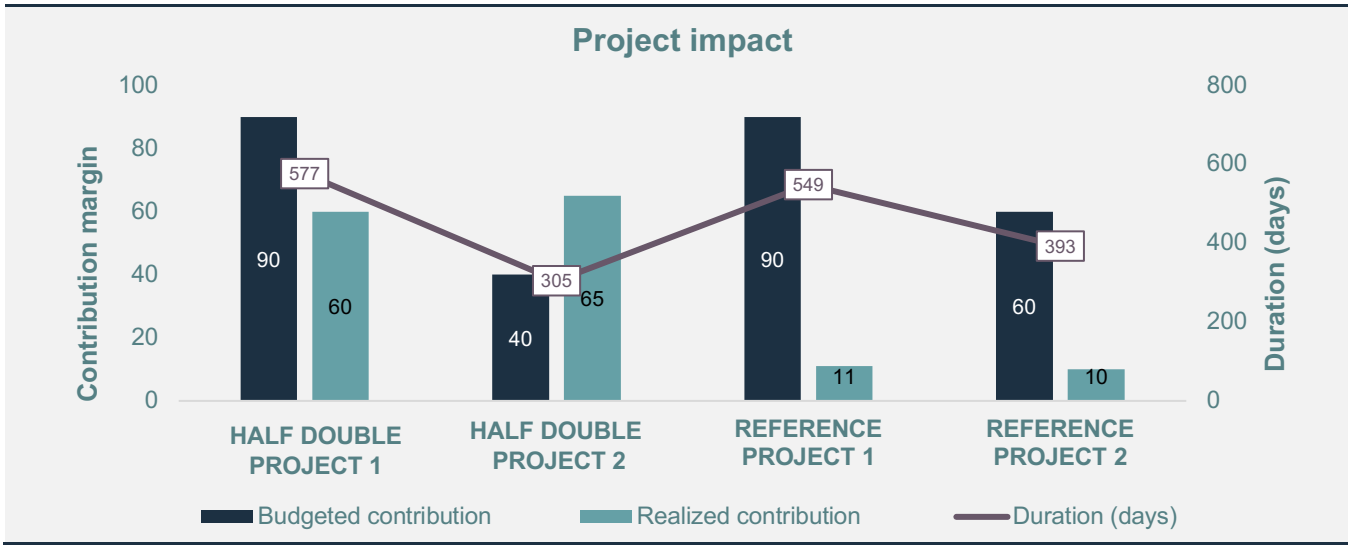


FIGURE 8.6: PROJECT IMPACT

As the figure shows, HD project 1's realized contribution is relatively close to its budget. HD project 2's realized contribution positively exceeds the budget. As for the two reference projects, none of the projects meet budgeted contribution and both contributions are lower than both HD projects. Based on this, HD project 1 is classified as medium performance, and HD project 2 as higher performance than comparable reference projects.

8.3.5 Evaluating project success

Both projects' success criteria are measured based on a post-project evaluation of customer satisfaction and loyalty conducted by an external consultancy firm. Both projects

have fulfilled their success criteria, as visualized in the two tables 8.5 and 8.6 below.

SUCCESS CRITERIA FOR HALF DOUBLE PROJECT 1	%-ACHIEVED
Aggregate score: Customer satisfaction (1-5)	4.33/5 = 86.6%
Aggregate score: Customer loyalty (1-5)	4.67/5 = 93.4%
TOTAL:	**90.0%**

TABLE 8.5: MALMOS HALF DOUBLE PROJECT 1 SUCCESS CRITERIA FULFILLMENTS

SUCCESS CRITERIA FOR HALF DOUBLE PROJECT 2	%-ACHIEVED
Aggregate score: Customer satisfaction (1-5)	4.67/5 = 93.4%
Aggregate score: Customer loyalty (1-5)	5/5 = 100.0%
TOTAL:	**96.7%**

TABLE 8.6: MALMOS HALF DOUBLE PROJECT 2 SUCCESS CRITERIA FULFILLMENTS

8.3.6 Evaluating project practices

To understand whether the HD projects' high success rates and positive performance differences are due to the HDM, Malmos has been evaluated in terms of the practices applied in their HD and reference projects. All four projects are mapped along the three principles of the HDM: Impact, Leadership, and Flow – and scored according to their usage (1=low and 4=high). Scores below 2.5 we consider relatively low. Scores above 2.5 we consider relatively high.

The overall average score for HD projects 1 and 2 is 2.54 and 2.97 respectively. This is a high score indicating that the two HD projects apply the HDM. For Malmos, this can also highlight a learning curve as they were taught the HDM during HD project 1 and could apply learnings on HD project 2. Moreover, the two HD projects use the HDM more than reference project 1 and 2 scorings of 2.37 and 2.08, respectively. As such the reference projects are not using the HDM.

As the two HD projects use several of the HDM practices more than the two reference projects, it seems reasonable to believe that part of the reason for the HD projects' higher performance and success rates reside in the HDM.

8.3.7 Evaluating the Half Double Methoolodgy in Malmos

Overall, conclusions from the evaluation of the HDM in Malmos is that the HDM seems to be applicable and make a positive difference. Both HD projects fulfill their success criteria and hence, their absolute success rate is high. In terms of their relative performance, the two HD projects have a higher impact compared to the reference projects when evaluated on the measure of contribution margin, whereas the picture is more nuanced when evaluating time. HD project 1 is the longest project although it is using considerably fewer hours than reference project 1. HD project 2 has a medium duration but is using the fewest hours across all four projects. Based on these results and to ensure consistency across all project evaluations, HD project 1 is a medium performing project, and HD project 2 is a higher performing project. The overall evaluation mirrors the positive impression of the HDM in Malmos both from the project manager of the HD projects and from top

management. Hence, the case study shows that the HDM is applicable and able to make a positive difference in a medium enterprise.

8.4 Three perspectives on Half Double in small and medium enterprises

This chapter can be summed up in three evaluation parts: (1) process, (2) outcome, and (3) learning.

Process evaluation pertains to practices of the HDM from which we saw indications of a fit between the HDM and SMEs with average

none are low while two are missing data. Of the nine HD projects, two have a higher performance, one has a medium and one has a lower performance compared to the reference projects while four are missing data.

Learning evaluation pertains to the four latest SME HDM projects of phase 3 emphasizing the benefits of the HDM's simplicity, and how the HDM strengthens the SMEs project culture and performance, but also that implementation requires external help.

The concluding remarks can be summed up into three attention points for SMEs considering implementing the HDM.

First, the HDM is simple and the practices can be executed by the SMEs. Research suggests that SMEs require simple project management practices and methodologies (Turner et al., 2012; Vestgaard et al., 2018).

Second, over half (56%) of the SME HD projects have high success criteria fulfillment. This finding can aid SMEs as they prefer trusted techniques (Turner et al., 2009). Still, it does not solve all SME challenges.

Third, data suggest implementing the HDM with the aid of external consultants. This is recommended to avoid misinterpretations of high scores of practice utility, albeit a low score in the smallest organization. This is important to read and understand with precaution, as this chapter's data collection consists of only eight SMEs, one categorized as small, two as medium, and five organizations as large-medium.

Thus, the outcome evaluation pertains to the eight SME HD project results, which we examine in terms of relative performance and absolute success rate. Of the nine HD projects, four have a high success rate, two are medium and

the HDM and diluting it into another form. This is also reflected in Turner et al.'s (2009) emphasis on SMEs using trusted techniques and not working systematically with project management (Vestgaard et al., 2018) partly due to employees not knowing what project management is about (Turner & Ledwith, 2018).

9 Evaluating Project Half Double Phase 3

By Anne Jensby and Anna Le Gerstrøm Rode (Aarhus University)

The purpose of this chapter is to provide a formative evaluation of phase 3 of Project Half Double (PHD) defining the status halfway into the phase and identifying current challenges and possibilities for future improvement.

The chapter is structured as follows: First, we introduce and define the notion of formative evaluation. This will be followed by an introduction to the PHD evaluation strategy of phase 3 serving as the baseline for a status evaluation. Based on the preceding chapters of this report and a formative evaluation workshop with the core group of PHD, we will lastly elaborate on challenges and opportunities according to the objectives of PHD phase 3.

9.1 Defining formative evaluation

Overall, evaluation can be defined as the "general process of determining the merit, worth, and value of something" (Vedung, 2006, p. 397). The notion of program evaluation is defined as the process of collecting empirical data and contextual information on a program (Chen, 2015) which in our case is the overall PHD in its third phase. Further, evaluation can be classified as having one of two distinctive roles: being formative or summative (Scriven, 1967, 1991). According to Scriven (1991), formative evaluation is conducted during a program (such as PHD) "with the intent to improve" (1991, p. 169) the program before it is finished. This is also referred to as a constructive evaluation which is different from a conclusive evaluation and is defined by its purpose of identifying effectiveness as well as current strengths and potential weaknesses to improve a program's chances of success (Chen, 2015).

This report of PHD aims to provide a formative evaluation of PHD phase 3 at its current (mid-term) stage to generate constructive knowledge (Chen, 2015) with the potential of further improving and refining phase 3. The final report on phase 3, which will be published when the third phase ends, has the aim of providing conclusive knowledge based on reviewing the results before closing phase 3 of PHD.

Conclusive knowledge relates to the notion of summative evaluation, which is conducted after the completion (Scriven, 1991), as an assessment of the generated results (Chen, 2015).

Both formative and summative evaluation can be focused on evaluating outcomes as well as evaluating the process towards the outcome (Chen, 2015; Scriven, 1991)

The focus of this chapter is primarily the outcome dimension, as we focus on evaluating the targeted and achieved impact of PHD. Hence, the chapter disseminates the knowledge generated based on a formative outcome evaluation.

9.2 Status on Phase 3 of Project Half Double

The evaluation presented in this report is based on the evaluation strategy for phase 3 of PHD authored by the research team at Aarhus University and approved by the sponsoring party: the Danish Industry Foundation. This evaluation strategy takes a point of departure in the logical framework for

evaluation (Baccarini, 1999; Couillard, Garon, & Riznic, 2009) as presented by The Danish Industry Foundation (n.d.). The model which is illustrated in figure 9.1 centers around input, activities, output, outcome, and impact required to reach an overall objective and purpose.

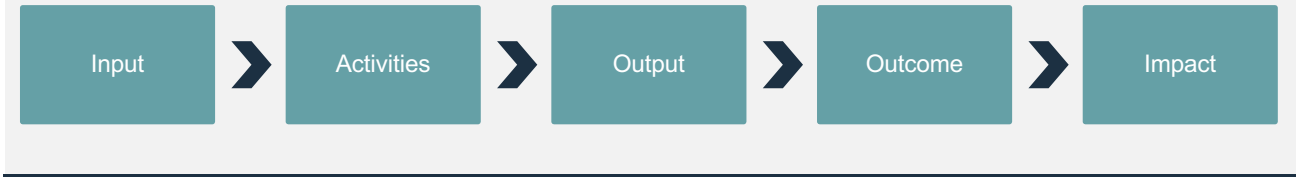


FIGURE 9.1: THE LOGIC MODEL FOR EVALUATION (ADOPTED FROM THE DANISH INDUSTRY FOUNDATION)

Further, we expand this model with an evaluation framework based on four evaluation approaches: (1) process, (2) outcome, (3) benchmarking, and (4) learning.

The overall purpose of PHD phase 3 is to *"diffuse and broaden Half Double to a number of small and medium-sized organizations to reach a tipping point; thus creating a sustainable business model, in which the concept of Half Double can continue as a self-sustaining and independent entity."*

Accordingly, the evaluation strategy phase 3 aims to reach two main impacts:

Impact 1: 1,000 organizations have applied the HDM to some extent.

Impact 2: An independent Half Double institute, standard, and certification are established and in operation.

Based on these two impact targets, eight outcomes are defined and operationalized. These targets are listed in table 9.1 showing the outcome definition and operationalization as well as the relationship with one of the two impact targets and how these aspects are evaluated.

IMPACT TARGETS	OUTCOME TARGETS (DEC. 2022)	OUTCOME STATUS (DEC. 2020)	INCLUDED IN THIS REPORT	OPERATIONALIZATION
N/A	10 publications for academics on PHD	10	Appendix A	• 8 conference proceedings • 2 journal articles
IMPACT TARGET 1: 1,000 organizations have applied the HDM to some extent.	1,000 organizations inspired to use the HDM	67[1]	Chapter 4-8 (Appendix A)	• 22 case studies from phase 1, 2 and 3 • Survey from phase 3
	50 SMEs applying the HDM	37[2]	Chapter 8 (Appendix A)	• 8 case studies from phase 1, 2 and 3 • Survey from phase 3
IMPACT TARGET 2: An independent Half Double Institute, standard, and certification is established and in operation.	10 official partners connected to HDM	4	*Numbers provided by the Half Double Institute.*	
	1,000 certified HD practitioners	458		
	3,000 HD community members	1,819		
	75 registered HD trainers	19		
	3 infused PM standards related to the HDM	0		

[1]The number is calculated based on an accumulation of 22 case studies of individual organizations implementing the HDM in phases 1, 2, or 3 plus an accumulation of survey answers from individual companies registered with a CVR number in the national database (Denmark's Central Business Register) accessible at https://datacvr.virk.dk/data/ minus redundant cases.

[2]The number is calculated based on an accumulation of eight case studies of individual SMEs implementing the HDM in phases 1, 2 or 3 plus an accumulation of survey answers from individual SMEs registered with a CVR number in the national database (Denmark's Central Business Register) accessible at https://datacvr.virk.dk/data/ minus redundant cases: the number of employees in all organizations is checked in the national database's current employee counts in January 2021 and organizations with a headcount above 1,000 employees are excluded.

TABLE 9.1: STATUS EVALUATION OF PHASE 3 OF PROJECT HALF DOUBLE

As shown in the first row of table 9.1, the research team has reached its target of delivering 10 publications for academics related to PHD. All these publications are peer-reviewed and consist of eight conference proceedings and two journal articles. The publications are primarily authored by one or several members of the research team of PHD at Aarhus University, whereas selected publications are co-authored with partners from other universities and the industry. A list of all the publications for academics can be seen in Appendix A.

Moreover, the role of the research team is connected to the second row of the table: first impact and its two associated outcomes.

The number of organizations applying the HDM is calculated based on an accumulation of the 21 HD case studies presented in the prior chapters 4-8 as well as a survey report

on project practitioners' application of project management methodologies including the HDM (Boris & Svejvig, 2020). The current total of 67 organizations is considered a small number compared to the target of 1,000 organizations.

The number of SME organizations applying the HDM is calculated based on an accumulation of the eight SME PHD case studies presented in chapter 9 as well as SME answers from the survey report on the questionnaire on project management methodologies (Boris & Svejvig, 2020). The current total of 37 SME organizations is considered a large number compared to the target of 50 organizations.

Moreover, it should be noted that these two numbers only refer to the number of organizations and SMEs that use or have used the HDM documented in our data set, which probably lack data on some organizations and SMEs. Notwithstanding, the outcome status of the first impact target shows that PHD is gradually progressing and slowly moving towards a tipping point aligned with the purpose of phase 3.

Regarding impact 2 and the five associated outcome targets, the status numbers are provided by the Half Double Institute. Status on the first three outcomes amounts to approximately half of the targets and hence reflects the timing halfway into the third phase. However, the fourth and fifth outcomes show that status is only 19 out of 75 registered HDM trainers, and zero of three HDM infused PM standards has been achieved. Altogether, status on these five outcome targets illustrates that PHD is also slowly progressing towards the second impact and that an independent and sustainable Half Double Institute is gradually being established.

The insights from the above status evaluation are used to generate what (Chen (2015) describes as constructive knowledge for improvements of the rest of PHD phase 3.

9.3 Challenges and opportunities for Phase 3

The current status and progress of PHD's impact and outcome targets have encouraged a discussion in the PHD group on challenges and opportunities in this third phase of PHD.

Although, the evaluation shows that PHD is gradually progressing; challenges do exist. In this section, we commence by breaking down three identified challenges. This is followed by possible explanations for the challenges. Based on the explanations, we present opportunities for PHD to maintain momentum and improve phase 3.

9.3.1 Diffusing the methodology across organizations

The first challenge concerns the impact target of 1,000 organizations having applied the HDM. At this point, this target is ambitious. Many organizations employ already established project management methodologies (PMMs) or tailor their own specific ways of conducting projects. There are many different PMMs, and organizations can have many different preferences and demands for PMMs. At the same time, there is a temporal factor for innovations, such as the HDM, as they often follow a curvilinear process of diffusion characterized by slow initial adoption, later followed by rapid diffusion, and then gain wide acceptance (Lawrence et al., 2001). Further, diffusion can come from mimetic and normative pressures that can compel other organizations to adopt and drive institutionalization (DiMaggio & Powell, 1983). This suggests that it takes time and resources to spread the HDM, not only internally in an organization but also across organizations, which is also established in chapter 8 of this report. It can be challenging

for organizations to adopt new practices and change their current ways of doing projects.

Besides the overall goal of 1,000 organizations, this challenge also relates to the more specific aim of reaching 50 SMEs. In this context, SMEs differ from larger organizations: not only when it comes to the mere size of them. SMEs have other approaches to project work, different requirements to PMMs, and often other resources to implement - as established in chapter 7. SMEs are more informal than larger organizations using lite versions of project management (Turner & Ledwith, 2018), and for PMMs and SMEs there are no *one size fits all* (Vestgaard et al., 2018). Further, SMEs do smaller projects, they have multidisciplinary teams and multitasking employees (Turner & Ledwith, 2018). This suggests that SMEs are often extremely busy and therefore risk failing to realize new efficient ways of doing projects. The SME segment must be approached differently compared to larger organizations. Current considerations in PHD are that the SMEs require a different narrative and language and another way of implementing the HDM compared to larger and more mature organizations. The HDM can be offered as a simple tool not just to project management but to teamwork in general as indicated in chapter 8. Chapter 8 reveals that HDM offers great potential for SMEs as this segment requires a simple PMM, which is exactly what the HDM is. This reflects an opportunity for the HDM to be diffused, adopted, and institutionalized in this segment as a simple but impactful PMM.

9.3.2 Combining the methodology with other standards

The second challenge suggests a reflection on how the HDM can develop into a hybrid solution with other existing methodologies. This challenge is prevalent in chapters 7 and 8, which identify organizations being challenged by their current applications of other PMMs as well as different project types with different needs and therefore requests hybrid solutions – combining the HDM with other PMMs. In addition, research suggests that hybrid approaches to project management are widespread as well as effective and that project teams adjust and blend methodologies and practices to best fit this particular context (Gemino, Horner Reich, & Serrador, 2020). It is recommended to develop and disseminate HDM plugins showing how the HDM can be utilized and to accentuate the effects generated in other established PMMs and standards such as PRINCE2, IPMA, PMI, Scrum, and SAFe, which many organizations have currently implemented. This suggests a double benefit in the HDM: that it can stand alone as a simple tool which is easily adapted, and that it can work well in combination with other more elaborated PMMs.

9.3.3 Abstracting the methodology to a reflective mindset

The third challenge pertains to balancing the benefits of using the HDM as a flexible mindset for project management and abstracting too much from the concrete HDM thereby risking losing the full potential and effect of the methodology residing partly in the synergies between the HDM elements. In case the whole package of the HDM is not implemented, the potential benefits of the HDM can get lost in translation. Notwithstanding, the notion “no one size fits all” is central to the HDM; the HDM should be adapted according to people and projects. This is reflected in chapters 7 and 8 documenting that organizations use PMMs differently. For instance, in a few cases, the HDM has traveled out of the project management domain to become a general mindset with selected practices used in teams working on smaller assignments. Organizations and projects can benefit from

this flexibility of the HDM. However, extreme customization and adaptation leading to contextual embeddedness that is so profound that the HDM becomes part of the informal organization, and an underlying assumption guiding the ways things are done may signify that the HDM becomes invisible and that the official link to the HDM disappears. This is not a problem in itself as long as these ways of working benefit the organization - because the overall goal of the HDM is to improve the competitive advantage of organizations in the Danish industry. It is, however, a methodological challenge in terms of measuring the number of organizations that have applied the HDM if the methodology has become so internalized that the organization's application of the HDM it is not recognized and reported.

9.4 Final remarks on formative evaluation of phase 3

Based on the formative evaluation above, we find that PHD phase 3 is slowly progressing towards the eight outcome targets and two impact targets. However, we also find that it is not without challenges. We scrutinize three of these challenges to come up with possible explanations and inspiration for resolving them and for refining the rest of phase 3. Based on a review of the previous chapters of this report which include empirical and theoretical investigations, we conclude that the current status evaluation of phase 3 leaves room for improvements and windows of opportunity for further development, as phase 3 continues towards realizing its overall ambition of "improving Denmark's competitive advantage through a PMM that leads projects with double the impact in half the time".

10 Conclusion

By Anna Le Gerstrøm Rode (Aarhus University)

More than five years have passed by since the formal launch of Project Half Double (PHD) in June 2015, and the journey is now in its third phase.

The Half Double Methodology (HDM) has been designed, discussed, developed, implemented, evaluated, and refined to reach a mature state.

This report echoes earlier conclusions indicating that the Half Double (HD) project management methodology may lead to higher project performance and high success rates in the projects applying it.

In this report, we show that in nine (56%) of the first 16 HD projects implementing the HDM, the success rate is high and in almost half (47%) of the HD projects the performance is higher relative to comparable reference projects not implementing the HDM. The combination of success rate and performance evaluations show that nine (56%) HD projects have a medium or high performance and/or success rate. More than half of these nine (56%) HD projects both have a higher performance and a high success rate. We have put these evaluations into perspective by comparing the numbers with other studies evaluating project performance, and the benchmarking shows that the HD projects distinguish themselves by a relatively low failure rate and a prominent focus on stakeholder satisfaction.

We analyze the characteristics of the best HD projects and show that the HDM seems to work well across a variety of contexts. Evidence is strongest in large organizations within healthcare, electronics, foods, and manufacturing industries as well as in small and short projects of various types but especially within supply chain optimization.

Furthermore, we analyze the practices employed in the HD projects and the comparable reference projects, and we show that all three core principles of the HDM are represented more in the HD projects compared to the reference projects – suggesting that the HDM provides a radically different way of managing projects and that the HDM's introduction has significantly changed usual practice. In specific, the impact principle makes the biggest difference – largely a result of HD projects' intensive use of the Pulse Check practice.

Moreover, we analyze the diffusion of the HDM in 17 case organizations and show that the HDM has been able to maintain itself in many of the organizations after the HD projects are finished. However, we also find that it is a challenge to share and diffuse the HDM to other project teams and departments.

Finally, we extend our analyzes outside the initial case organizations of phases 1 and 2 and into the specific context of small and medium sized enterprises (SMEs), and we show that their project performance and success rate are not remarkably different from larger enterprises. In specific, five of nine SME HD projects have a high success rate, and none have a low success rate. Moreover, two of five SME HD projects, where data on comparable reference projects are also available, have a higher performance, two have a medium performance, and one has a lower performance. Together, these evaluations indicate that although introducing and implementing a project management methodology like the HDM in the SME context can be a challenge in itself; the results are

encouraging. Based on the qualitative learnings from this segment, it seems that there is room for improvements and great potential for SMEs embarking on a HD journey.

Altogether, the evaluations consolidated in this report are promising regarding the use of the HDM, but they also confirm that “one size” does not fit all and no methodology is applicable everywhere.

Evaluating projects as well as project management methodologies like the HDM is a dangerous endeavor, and there is a complex relationship between using a project management methodology and the resulting project performance and success rate, which is influenced by an unlimited number of organizational and project characteristics and contextual factors. We certainly acknowledge the complex relations between project methodology and context as well as performance and success and refer to Appendix C for a further discussion of the important limitations of the work presented in this report.

Appendix A: Research Publications

By Anna Le Gerstrøm Rode (Aarhus University)

This appendix lists the materials published by the research team on Project Half Double (PHD) from the start of phase 1 in 2015 until the middle of phase 3 in December 2020.

The list is divided into two parts:

1. **Publications for practitioners** comprise material produced for practitioners and cover the results from a survey from phase 3 as well as four case reports and a theme report on phase 1 and phase 2 plus a brief overview of five key findings and a single case study of a Half Double (HD) project in one organization.
2. **Publications for academics** comprise material produced for academics and cover a total of 10 conference proceedings and journal articles**.**

Ad 1. Publications for practitioners

Boris, P. N., & Svejvig, P. (2020). *Survey on project management methodologies used in the Half Double Community*. Aarhus: Aarhus University.

Rode, A. L. G., Hansen, A-S., Svejvig, P., Ehlers, M., Thorp Adland, K., Ruth, T. K., Anker Nissen, N., Waldemar, R., Zippora Klein, J. B., Edmund Pedersen, S., Ekhall, C-J., Ypkendanz, L., Paludan, U., & Greve-Viby, A. M. (2019). *Project Half Double: Results of phase 1 and phase 2, June 2019*. Aarhus: Aarhus University.

Rode, A. L. G., Frederiksen, S. H., & Svejvig, P. (2018). Project Half Double: training practitioners, working with visuals, practice reflections and small and medium-sized enterprises. December 2018. Aarhus: Aarhus University.

Rode, A. L. G., & Svejvig, P. (2018). High Level Research Findings from Project Half Double. Aarhus: Aarhus University.

Rode, A. L. G., & Svejvig, P. (2018). *A Half Double case study: SAS Ground Handling pilot project*. Aarhus Universitet.

Svejvig, P., Adland, K.T., Klein, J. B. Z., Pedersen, S.E., Anker Nissen, N., & Waldemar, R. (2017). Project Half Double: Current Results of Phase 1 and Phase 2, December 2017. Aarhus: Aarhus University.

Svejvig, P., Gerstrøm, A., & Frederiksen, S. H. (2017). Project Half Double: Addendum: Current Results for Phase 1, January 2017. Industriens Fond, Aarhus Universitet, Danmarks Tekniske Universitet, Implement Consulting Group.

Svejvig, P., Ehlers, M., Adland, K. T., Grex, S., Frederiksen, S. H., Borch, M. M., Boston, N.E., Erichsen, D.B., Gyldahl, C., Ludwig, C.B. & Pedersen, S.E. (2016). Project Half Double: Preliminary Results for Phase 1, June 2016. Industriens Fond, Aarhus Universitet, Danmarks Tekniske Universitet, Implement Consulting Group.

Ad 2. Publications for academics

Hansen, A.-S., Svejvig, P., & Hansen, L.-K. (2020). Revisiting Shenhar and Dvir's diamond model: do we need an upgrade? Paper presented at the International Project Management Association (IPMA) Research Conference, online.

Svejvig, P., Geraldi, J., & Grex, S. (2019). Accelerating time to impact: Deconstructing practices to achieve project value. International Journal of Project Management. doi:10.1016/j.ijproman.2018.12.003

Rode, A. L. G. & Svejvig, P. (2018). Project evaluation: one framework – four approaches. Paper presented at Fourth Danish Project Management Research Conference, Copenhagen, Denmark.

Svejvig, P., Geraldi, J. & Grex, S. (2017). Accelerating time to benefit: Deconstructing innovative organizational practices in five projects. Paper presented at IRNOP 2017 (International Research Network on Organizing by Projects), Boston, MA, USA.

Frederiksen, S.H. & Svejvig, P. (2017). The Collaborative Project Owner in Theory and Practice: Examples from Project Half Double. Paper presented at Third Danish Project Management Research Conference, Copenhagen, Denmark.

Laursen, M., Svejvig, P. & Rode, A.L.G. (2017). Four Approaches to Project Evaluation. Paper presented at The 24th Nordic Academy of Management Conference, Bodø, Norge.

Heeager, L.T., Svejvig, P. & Schlichter, B.R.(2016), ”How has Agile Methods Inspired an Industrywide Project Management Initiative?”. Selected Papers of the Information Systems Research Seminar in Scandinavia, Issue No. 7.

Heeager, L. T., Svejvig, P., & Schlichter, B. R. (2016). How Agile Methods Inspire Project Management - The Half Double Initiative. Paper presented at the International Research Workshop on IT Project Management 2016. Paper 13., Dublin.

Svejvig, P. & Grex, S. (2016). The Danish agenda for rethinking project management. International Journal of Managing Projects in Business, 9(4), 822-844. doi:doi:10.1108/IJMPB-11-2015-010.

Svejvig, P. & Hedegaard, F. (2016). The challenges of evaluating and comparing projects – An empirical study of designing a comparison framework. In J. Pries-Heje & P. Svejvig (Eds.), Project Management for Achieving Change (pp. 107-129). Frederiksberg: Roskilde University Press.

Appendix B: Research Methodology

By Per Svejvig (Aarhus University)

Project Half Double (PHD) has an engaged scholarship approach (Van de Ven, 2007) and uses action design research (ADR) (Sein, Henfridsson, Purao, Rossi, & Lindgren, 2011) where ADR has elements of action research (interventions) and design research (artifacts) (Goldkuhl, 2012).

The ADR methodology implies close collaboration between practitioners, consultants and researchers to design, intervene, and evaluate (Sein et al., 2011). Some of these activities are briefly presented in chapter 2, 'Telling the Half Double Story' and shows that many stakeholders are involved in PHD from industry, consultancy companies and universities.

PHD has designed two primary artifacts: (1) The Half Double Methodology (HDM) mainly designed by consultants but co-created with practitioners and researchers, and (2) The Project Evaluation Framework, which is designed by researcher but adapted throughout the project. Additional artifacts are being worked on such as 'Half Double Certification' scheme. HDM is used by practitioners and consultants to execute projects in organizations, while the researchers are using the project evaluation framework to evaluate HDM.

The study can be divided into two overlapping cycles, the problem solving cycle and the research cycle (Mathiassen, Chiasson, & Germonprez, 2012). The problem-solving cycle is driven by practitioners and consultants, and the research cycle by researchers, but the two cycles are highly intertwined and interdependent.

We use a mixed method approach (Cameron, Sankaran, & Scales, 2015; Tashakkori & Teddlie, 1998) combining qualitative and quantitative data, and a pragmatist philosophy (Biesta, 2010; Goldkuhl, 2012).

Data generation applies a variety of research methods such as interviews, focus group meetings, surveys, workshops, participant observations, and review meetings. Project documentation, presentations, governance documentation, company information, emails as well as public information are also used. We deliberately label it data generation and not data collection because much data is constructed and co-created in a dialogue between practitioners, consultants and researchers, so we as researchers are part of the field we study. We have a focus on problems, practices and relevance and do value driven research (Saunders, Lewis, & Thornhill, 2016, p. 137) to make it useful for both practice and academia.

Data analysis includes mixed methods analysis where we combine qualitative and quantitative data. We apply different kind of qualitative analysis such as thematic analysis (Braun & Clarke, 2006), qualitative comparative analysis (Rihoux & Ragin, 2009), pattern analysis (Yin, 2014), and theory building from cases (Eisenhardt & Graebner, 2007). This is complemented by quantitative data analyses covering univariate and multivariate analysis (Bryman, 2012; Tabachnick & Fidell, 2018) for descriptive statistics, regression analysis etc.

The learning from the research process are formalized into a number of conference papers and journal papers targeting the research community but also for reflective practitioners (L. Crawford, Morris, Thomas, & Winter, 2006). We have in addition published a number of reports targeting practitioners as this report. Please refer to appendix A for a complete list of publications.

Our research is disseminated in various ways. First, PHD hosts on a regular basis smaller and larger events for the Half Double Community where both practitioner and research-oriented topics are covered. Second, we are often invited by companies, consultants, networks and associations to share our research at practitioner events, physical and online, and this is an important part of sharing knowledge between researchers and practitioners. Finally, we participate in academic conferences to discuss our research with peers. Note that the work presented in this report is not peer reviewed and as such it is not to be regarded as finished research results but as work in progress (Aarhus University, 2019). Please refer to appendix C for further limitations.

Appendix D: Research Limitations

By Anna Le Gerstrøm Rode, Pernille Nørgaard Boris and Anne Jensby (Aarhus University)

This appendix gives an overview of the limitations of the work presented in this report. These limitations should be taken into account when considering the conclusions. As an introductory remark it is worth mentioning that the study is action research in which researchers and practitioners join and learn together as they interact and collaborate during a cyclical and evolving research process (Rogers & Williams, 2006). Following these lines, the results presented in this report is based on data which is to a large extent co-created with practitioners. Moreover, the methodological nature of the study is emergent, meaning that the evaluation process and procedures is not stringent and fixed across time but develops through the study as we allow ourselves to integrate new insights and make adjustments to improve the quality of the study (Silverman, 2020).

This appendix is structured as follows. As comparison is at the center of this study, the first section highlights the challenges in terms of comparing projects and their management practices as well as their performance and success rates because projects and their contexts are unique. Following these lines, the second section considers the nature of the inferences based on the comparison and pinpoints two biases (Halo and Hawthorne) at play in the study before moving on to consider the role of the researchers as well as the research's overarching paradigm and the deductive nature of most of the studies. The third section concerns the data generation methods and its limitations. The fourth section concerns the data analyses methods and its limitations. The final section outlay the boundaries of this report and suggests possibilities for further research.

1. Comparison

First of all, a large part of the research published din this report is based on comparative case studies (Yin, 1989) which rely on systematic comparison (Bryman, 2004; Chen, 2015; Stufflebeam & Shinkfield, 2007). These comparisons include internal benchmarking of HD projects and reference projects within each case organization but also external benchmarking of projects between case organizations (Barber, 2004).

1.1 Unique projects

These comparisons are done in order to elicit indicators of effects of the Half Double Methodology (HDM) in positive performance differences between the Half Double (HD) projects and comparable reference projects (Dahler-Larsen, 2013). In order to justify assignment of positive performance differences in HD projects to the HDM the projects needs to be comparable and ideally identical on all other aspects besides the HDM (Yin, 1989). We generate data on a large number of dimensions to get clues on the extent to which HD projects and reference projects are comparable. But, it is difficult to compare projects as all projects are unique. Although we try to take a holistic view of the projects by evaluating them in different conceptual frameworks, we cannot measure and control for everything. For instance, we analyze all HD projects in terms of pace, technology and novelty based on Shenhar and Dvir's (2007) diamond model and in terms of complexity based on Fangel's (2005) characterization of management complexity as well as size in terms of hours and cost inspired by the classical iron triangle (Atkinson, 1999). However, these dimensions are of a rather "hard" and technical nature whereas more personal and "soft" aspects

pertaining to the people involved receive less focus. Although, for instance, project participants' competences and backgrounds are included as part of the complexity scoring (Fangel, 2005), further research that takes a broader and deeper view on the project practitioners could be done. For instance, project participants' competences, capabilities, experiences, trainings, certificates, identities and sensemaking processes are not taken into account. Project governance (Joslin & Müller, 2015, 2016) and project managers' leadership style (Lorinkova, Pearsall, & Sims Jr, 2013) as well as their intellectual, managerial and emotional competences (Müller & Turner, 2010) are only briefly touch upon in the practice scorings. More empirical data could have been generated and analyzed – also in terms of team members' relations, interaction and teamwork. Hence, when considering the results, it should be noted that these softer and more psychological aspects are only concisely covered in the investigation.

1.2 Unique contexts

As all HD projects and reference projects are situated within the same organization, they do as a starting point have the same contextual conditions: they are in the same sector and industry.

However, they might not be in the same marketplace or geographical area. Such location aspects play in and can erode the established similarity of the organizational context of the HD projects and reference projects. Sometimes the contexts differ because the projects are in different markets (e.g., cargo flights versus passenger flights) or sites (e.g., Aarhus versus Grenaa) and some projects are more cross-national or international than others. Hence, place matters in terms of where in the organizational contexts the projects are located.

Moreover, time matters in terms of when the comparison and the projects are done. The timing of the comparison can be in favor of one or another project. Such aspects play in and can erode the established similarity of the context of the HD projects and reference projects: as they are performed at different times – they don't have exactly the same context. In terms of time, the organizational context is never the same. Instead, an organization is always in flux and can be seen as an organizing process in constant movement (De Cock & Sharp, 2007; Hernes & Weik, 2007). Hence, there can be changes in the organizational culture or structure which circumstantiates the HD projects and reference projects with varying chances of success. Moreover, as time goes one can expect the organization gest more experience in project management, learns from these prior experiences and becomes more mature and better at managing projects. Because the HD projects are often compared to reference projects that are done at an earlier point in time, one could argue the HD projects have better odds and chances of success are higher already from the outset.

1.3 Project practices

A key element in the comparative study is comparison of project management practices: what is actually done within each project. Data is gathered and analyzed in order to establish the degree to which projects use the HDM. This research process has been challenged by the fact that the HDM is an emerging construct. The HDM is an artefactual design in development, meaning that the HDM is adjusted and improved as it is applied and knowledge and learnings are obtained, the HDM changes over the course of the study. This means that not all projects are evaluated against the same practices. Such differences are not to be regarded as a rigorous error. Rather, these changes should be seen as a methodological precondition for an experimental process and a natural part of an

action design research (Sein et al., 2011; Svejvig & Hedegaard, 2016) study in which practical change and knowledge production go hand in hand (Nielsen, 2013).

1.4 Project performance and success

Last but definitely not least the comparative study compares the performance of the HD projects and reference projects based on a categorization of projects as high or low performing and more or less successful. Project success is a multidimensional and contested concept (Judgev & Müller, 2005) that lies in the eyes of the beholder (Joslin & Müller, 2016). Also, the projects analyzed in this report might be perceived as more successful by one stakeholder and less successful by another (McLeod et al., 2012; Nelson, 2005). Although we have tried to circumvent these issues by ensuring the HD project evaluations are based on a set of broadly agreed upon success criteria established from the beginning of the project life cycle (Judgev & Müller, 2005), criteria or their relevance might change as the context and/or project changes (Christensen & Kreiner, 1991). Learning arises as the project develops and new insight might change the project and its success criteria. Correspondingly, in some cases the success criteria have changed over time. We also experience that the projects' performance on a fixed success criterion operationalized in a key performance indicator change over time (e.g., SAS Ground Handling). Such findings are in line with research arguing for a broader understanding of projects' value creation and performance measurements in a long-term perspective (Laursen & Svejvig, 2016) also stretching beyond the timeframe of the first and second phases and the current stage of phase 3 of PHD. Consequently, the success evaluation and classification of the projects documented in this report might change and the projects' performance might be different if viewed in another light at a later point in time. Such circumstances are, however, a natural part of doing this kind of action design research (Sein et al., 2011; Svejvig & Hedegaard, 2016) and should not be seen as a scientific error.

2. Central terms

We acknowledge that we make the world with the words we use, and therefore it is important to clarify the meaning of two central terms presented in the next sub-sections.

2.1 Significance

The word "significance" has two meanings in the report.

In the pattern matching analyses across and within cases (Yin, 1989) based on a mix of qualitative and quantitative data, the word "significance" has the meaning of worthy of attention, noteworthy, substantial, striking or important.

In the statistical analyses based on quantitative scorings of project practices, the word "significance" refers to statistical significance, where a result is said to be significant if the alternative hypothesis cannot be rejected (Wurtz & Malchow-Moeller, 2014, p. 343).

2.2 Generalizability

The word "generalizability" also has two meanings in the report.

In the mixed methods analyses, the word "generalizability" has an analytical meaning. The reported findings are idiosyncratic because they are based on unique individuals acting within unique projects and organizations. The results are restricted in the sense that they are situated and bound to the contexts in which they are developed. Hence, we do not claim the results can be separated from their embeddedness and generalized to some higher level of abstraction. We can, though, generalize analytically in the sense

that we can make probable that the case organizations and projects studied also have some kind of universality to them besides their uniqueness and that their results therefore also have some kind of generalizability besides their idiosyncrasy that allow them to be abstracted to a higher analytical level and transferred to other contexts and cases (Yin, 1994). Many processes are similar across domains (Gioia, Corley, & Hamilton, 2012) and some of the case study results generated in this report have obvious relevance to some other domain. However, the extent to which this transferability is possible depends not only on the specifics of the studied cases but also on the specifics of the organizations and projects to which they will be transferred – and in this light, the analytical generalizability of the findings are to a large extend decided by the people who are situated within these contexts and know their specifics and similarities compared to the cases we have studied.

In the statistical analyses based on quantitative scorings of project practices, the word "generalizability" has another meaning. In that study, the word refers to the question of whether the results can be transferred to an underlying population (Wurtz & Malchow-Moeller, 2014, p. 206). In this study, it is not possible to make general conclusions which can be generalized in the statistical sense, because of a relatively low sample size for statistical evaluations. Nevertheless, the statistical results can be used for further discussion and focus in future research.

3. Reactivity: the Hawthorne effect

The Hawthorne effect (Baritz, 1960; Roethlisberger & Dickson, 1939) might be at play and cause reactivity – which is a phenomenon that occurs when individuals alter their performance or behavior due to the awareness that they are being observed and hence in experimental research design it causes a bias because results will not ne be representative (Heppner, Wampold, & Kivlighan Jr, 2008). The fact that the HD project practitioners know that they are being studied and are part of a larger research project probably has a positive impact on their behavior and might increase the performance of the HD project. Thus, it may be that the positive performance differences in the HD projects are due to the fact that they are part of a research process and less because of the HDM in itself. It would be naïve to think that we as researchers do not affect the object of analysis in this case. However, when engaging with practitioners and doing action research interaction between researchers and practitioners and its consequences is a precondition.

4. Optimism: the halo effect

Moreover, possibly results may be affected by the increased attention and special treatment given to the HD projects because of the new methodology in terms of extra resources from consultants assisting with training and coaching as well as reflective talks and interviews with the research team. It is also possible that the HD projects being part of an optimization experiment and development process have been paid more and positive attention from top management compared to earlier reference projects. Following these lines, the halo effect which is the tendency to generalize on the basis of one perceived trait of a phenomena to many other aspects and towards an overall judgment of the phenomena (Neuman, 2014, p. 4) might play a role. It is most likely that an initial decision from top management in the case organizations to take on the HDM and implement it in a selected project is based on a positive perception of the HDM which can spread and color the perceived effects of the methodology. Moreover, it is plausible that the authors contributing to this report are biased towards the HDM. In short, there is a possibility that the PHD participants are overly

optimistic. Again, it would be naïve to think that we as researchers do not affect the results.

5. Researchers as instruments

The Hawthorne and halo effects are based on a set off underlying assumptions about the nature of reality (ontology) and research (epistemology) which infer that it the world is objective and made up of causal relationships that cause and effect things (ontology) and that it is possible to do objective research that captures this reality (epistemology) (Burrell & Morgan, 1979). In general, one should be cautious of the objectivist paradigm and positivist understandings of the researcher as a neutral and detached observer (Bryman & Buchanan, 2009) that can report objectively on reality. This report is based on another paradigm which is pragmatism. It takes an engaged scholarship approach that relies on a rather subjective ontology (Van de Ven, 2007) recognizing that reality and research are subjective in nature. The study follows a postmodern paradigm and recognizes it is hard if not impossible to distinguish between the observed and the observer – between the subject and the object of study (Heidegger (1992) in Rendtorff, 2013). According to Bourdieu's reflective sociology, scientists are always embedded in and part of the context and phenomenon they study and therefore their position has implications for the knowledge they produce (Mathiesen & Højberg, 2013). In practice, it implies that we recognize that we coproduce data together with practitioners (project owners, managers and consultants) in collective meaning making processes and that our analyses are also subjective sensemaking processes and reflections of us as researchers.

6. Deductive methods

The research approach various throughout the process and is both inductive, adductive and deductive. However, most of the research behind the work published in this report is deductive in its nature as most of the data is generated and analyzed based on already existent theories and concepts. For instance, when evaluating the diffusion of the HDM within the case organizations, we base data generation and analysis on an assessment of criteria defined by the HDM and a theoretical lens chosen beforehand. Correspondingly, the analytical coding and categorization process is based on a theoretical reading of the interview data. When applying a theoretical lens beforehand, it is difficult to avoid theoretical one-sidedness, and there is a risk that it can hinder discovering new and hidden aspects (Kvale & Brinkmann, 2015).

7. Data generation and analysis methods

Overall, the PHD study is based on mixed methods and includes various combinations of qualitative and quantitative data generation and analysis methods. The limitations related to these methods are outlined in the sub-sections below.

7.1 Interpretations

The primary data behind the study is based on answers on questions to project participants. The understanding of the concepts behind these questions may differ between individuals and the researchers cannot be sure questions about ambiguous and complex concepts are perceived as intended. Even though much has been done to ensure a common understandings – for instance through a HD project test and supply of definitions of central terms there might be differences in individual understandings of the concepts (Silverman, 2020). Moreover, it is not the same people collecting all the data, which could mean different interpretations of questions, leading to differences in answers - both in terms of qualitative statements and quantitative measures. This can have had an effect on the results, which cannot be

documented since the direction of a potential bias is unknown.

7.2 Representativeness

Moreover, data on a given project is often collected from only one or a few project representatives that have partaken with different degrees in the project. Although, we have tried to select the people most knowledgeable of the projects, we cannot claim the data complete mirror the project or that it is representative of all practitioners working in the project.

7.3 Scorings

Some questions demands answers in quantitative scorings. Although the same standard explanations and examples are used within all organizations, arriving at a precise score is an absolute exercise the first time it is done within an organization. In organizations where we only have data on one project, comparison of the scorings between projects in other organizations can be troublesome because they are not scored relatively to each other. In organizations where several projects are scored, earlier scorings are used as a baseline in the scoring proses to assure internal alignment in the way the questions and projects are perceived.

7.4 Behaviour

Another limitation regards the fact that data on project management practices is based on questions and answers. Hence, we get a picture of what people say they do – and not of what they actually do. Observation is a preferable data generation method in instances where the aim is to get a clear picture of peoples' behavior (Silverman, 2020). However, an ethnographic study of the actual behavior of the people in the studied projects is very time consuming and often not possible because most of the reference projects are already finished when we start investigating them.

7.5 Media

Finally, in terms of the media, some of the questioning and answering is done verbally in surveys but most is done oral in onsite face to face interviews. When it has not been possible to conduct the interviews in accordance with this preferred standard, they were done online via video calls such as skype or teams, phone calls or in writing via e-mail correspondence. The latter can mean longer response time, providing different and more considered responses (Saunders et al., 2016).

7.6 Statistics

In terms of the statistical analysis a separate set of limitations needs to be considered. First, there are missing values in the dataset, which cannot be filled in as the data is either unavailable or not applicable and mean imputation do not make sense in this case. Second, it is not possible to determine potential outliers as each organization is very different, and we as outsiders only have limited access and options for comparing projects. Third, the T-test statistic require that the data is normally distributed. Møller Jensen and Knudsen (2014) describe how these criteria can be checked by evaluating a variable's skewness and kurtosis using the rule, that if the numeric value of the skewness (kurtosis) is not larger than two times the standard error for the skewness (kurtosis), then the value is not significantly different from 0 on a 95% confidence level. All practice scorings fulfill the criteria for skewness, where only 7 out of 9 practice scorings fulfill the criteria for kurtosis. The two practice scorings that do not fulfill the criteria are Solution Design and Active Project Ownership. This indicates that all the HDM practices besides Solution Design and Active Project Ownership can be assumed to fulfill the criteria of being

approximately normally distributed. For the two practices not fulfilling the criteria of being approximately normally distributed the nonparametric Mann-Whitey U test has been applied, where HD projects and reference projects are significantly different for both variables Impact Solution Design and Active Project Ownership. A final limitation regards a data entry mistake in the database for two HDM practices (Co-location and Reflective and Adaptive Mindset) in a single organization. The analysis has been performed again with the correct data points, which proved that the conclusions about the significance differences still remains and that the differences between HD projects and reference projects for the two practices are not diminished.

8. Further research

There are aspects not covered in this report and potential avenues for further research which can increase our understanding of the subject matters and mitigate the limitations mentioned above.

8.1 Critical perspectives

This report is not a critical review of the HDM, and we do not pertain to questions regarding to what degree projects can be delivered in half the time with double the impact. These statements are “consultancy jargon” and from a research perspective most likely exaggerated and overly optimistic. To get a broader understanding of the results reported in this report, the project evaluation of performance and success are put into perspective by juxtaposing the results to three external evaluation benchmarks providing a kind of baseline for project and project management success and failure. Such external benchmarking is done as an attempt to combat overly optimistic interpretations of the results. However, it should be noted that measures and their meanings vary across the studies. This is important to have in mind when interpreting such results.

8.2 Emperical investigations

Although data availability has increased substantially in this report compared to earlier reports (Rode et al., 2019; Svejvig, Adland, et al., 2017; Svejvig et al., 2016; Svejvig, Rode, et al., 2017), in some cases collection of the necessary data has not been possible. In other cases, data availability and access are vast. In these cases, possibilities of additional data generation and analysis that could further strengthen or challenge the work presented in this report exist. Such avenues include triangulating quantitative and qualitative data to find and follow new and intriguing avenues and to broaden and deepen results. In addition, a further exploration going into the specific details of one case organization or project could yield new knowledge on interesting micro particulars with a universal relevance. An additional avenue is research looking for exception, disconfirmation and conflicting or even contradicting clues to find puzzles instead of patterns in deviant cases, which could hold potential of double loop learning and further advancements within this area (Argyris, 1977; Rogers & Williams, 2006; Shaw, Greene, & Mark, 2006).

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