June 2025

Half Double Institute

Case study - Topsoe R&D

Acknowledgement

The authors would like to thank the Danish Industry Foundation and the Half Double Institute for funding this work and acknowledge contributions from all organizations involved. We would also like to thank Natasha Kaas Ollendorff for her work on the initial draft of this report.

CONFLICT OF INTEREST

The authors declare no conflict of interest regarding the funding agency, the Danish Industry Foundation, or any other parties involved in Half Double Institute.

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RECOMMENDED CITATION

Sejling, J., & Svejvig, P. (2025). Half Double Institute: Case study - Topsoe R&D*, June 2025. Aarhus University.*

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1 Executive summary

Topsoe, a global provider of technologies for converting renewables into fuels and chemicals, has recently applied the Half Double Methodology (HDM) in its R&D department. Topsoe R&D, which is responsible for developing and testing new technologies and products, set out to improve project management and establish a common project leadership methodology and culture in R&D projects.

HDM was introduced in 2020, and after a few successful trial projects, Topsoe R&D decided to establish a more comprehensive and uniform approach to project management with HDM. Topsoe R&D took extensive steps towards translating and fitting HDM to the local organizational context and culture and has since developed 6 best practices based on HDM, with added elements like risk and uncertainty management and much more. The final consolidation of HDM is now ongoing and the report at hand can be viewed as an evaluation of the usage of HDM in Topsoe R&D so far.

Overall, the Half Double Methodology has been effectively implemented in Topsoe R&D and on a similar level as previously studied organizations. Topsoe R&D has made substantial improvements in project work and communication flow and has also increased alignment between project teams and stakeholders. HDM has also helped balance leadership styles.

Compared to other organizations, Topsoe R&D excels in active project ownership and is more successful in using HDM to stay aligned with stakeholders and focusing on both business and behavioral impacts. Projects in Topsoe R&D which use HDM achieve higher success rates compared to projects which do not use HDM, and Topsoe R&D is only slightly behind on success rates compared to other organizations. These success rates are likely influenced by the complexity of the projects, which show a negative correlation with success. However, these points should be taken with caution, as our data on success is biased and limited.

The biggest advantages of using HDM in Topsoe R&D cover both impact creation, enhanced workflow and leadership engagement. The implementation of the Half Double Methodology at Topsoe R&D has enhanced role clarity, communication, and stakeholder alignment, fostering stronger leadership engagement, team spirit, and quality assurance. Its flexibility has enabled broad adaptation across projects, ultimately improving workflow and accelerating responsiveness to market demands.

Some of the key challenges of using HDM in Topsoe R&D have been a lack of built-in tools for managing risk and uncertainty and organizational resistance to change. A high meeting load, which has strained time allocation and reduced focus on core project tasks, has also been a challenge.

Despite of these challenges, project managers have highlighted how the flexibility of HDM, combined with employee autonomy and expertise, enables effective interpretation and adaptation of the methodology to local conditions. Finally, project managers have thus emphasized how HDM supports the development of a more holistic perspective on both projects and project teams.

Compared to the beginning back in 2020, Topsoe R&D has come a long way towards establishing a more comprehensive and uniform approach to project management with the implementation of HDM. The final consolidation of HDM is now ongoing with focus on reinforcing HDM culture and integrating the HDM approach in the creation of new business opportunities.

2 Introduction

The purpose of this report is to outline the evaluation and implementation of the Half Double Methodology (HDM) in Topsoe R&D, including how the methodology has been applied in the renewable energy sector. Knowledge is obtained through a detailed data collection process to examine the implementation and application of HDM in Topsoe R&D. For a thorough description of the research methodology and limitations, please refer to appendices B and C in Rode and Svejvig (2023).

All reports can be found here:
www.halfdoubleinstitute.org/research

3 Company information

Topsoe is a leading global provider of technology and solutions for the energy transition, offering solutions for transforming renewable resources into fuels and chemicals. Topsoe was established in 1940 by Haldor Topsøe with its headquarters located in Kgs. Lyngby in Denmark but has additional locations around the world such as in India and the US. As established in the Half Double project description to Danish Industry Foundation, we define large enterprises (LEs) as organizations with more than 1,000 employees, qualifying Topsoe as a LE - consisting of an average number of 2,800 employees (Topsoe, 2024) who generate an annual revenue of DKK 8,373 million (Topsoe, 2024). Topsoe primarily operates in the international market and specializes in technologies aimed at reducing carbonization (especially catalysts), and provides technologies and solutions for the energy transition, helping customers and partners achieve their decarbonization and emission reduction goals.

Key figures of Topsoe (2024):

- Employee count: 2,800
- Head office: Kgs. Lyngby, Denmark
- Annual revenue: DKK 8,373 million

4 The journey of implementing The Half Double Methodology

This section provides an overview of the implementation of HDM in Topsoe, specifically in research and development (R&D) projects in Topsoe. HDM is not employed in other types of projects within the company.

4.1 Half Double Initiation

HDM was introduced in Topsoe R&D in 2020 following initial contact with consultants in 2019. At first to evaluate its suitability, a few Half Double projects were initiated. After receiving positive feedback from project leaders, Topsoe R&D expanded its use and trained additional personnel, including project leaders and specialists, in HDM. To ensure a uniform approach to project management, Topsoe R&D launched a project named 'HD+' in the fall of 2023 to improve the use of HDM and establish a common project leadership methodology and culture in projects in Topsoe R&D.

Implementing HDM in Topsoe R&D necessitates a cultural shift within the organization. Despite the prevalence of numerous projects, project leadership, as an individual discipline, has been seen as an area for improvement. Often, R&D projects are specialist-driven, with experts making key decisions and managing the projects. This previous lack of focus on the discipline of project leadership has sometimes resulted in undefined decision processes and unclear roles and responsibilities within the projects. Topsoe R&D aimed to address these issues, which led to the adoption of a new project management methodology, marking the beginning of the Half Double journey.

However, altering long-standing practices can often encounter significant resistance. The process requires patience and sustained effort to ensure full adaptation and utilization of the Half Double principles. To facilitate this transition, a project handbook was developed in collaboration with

GO-DECISION	IMPLEMENTATION OBJECTIVES				ONGOING OPTIMIZATION
2020	**2021**	**2022**	**2023**	**2024**	**2025**
• Introduction to HDM and contact with consultants	• 8 HD projects initiated, stakeholder involvement in R&D, and project leadership community established	• Project Handbook released in R&D • Workshops, seminars and HDM foundations course for project leaders • The first certification of Practitioners	• Increased involvement of leadership in following up on HDM usage • Training program for new team members • Updates to the Handbook • Ongoing training	• Project infrastructure established and increased standardization across projects • Ongoing training and training targets established • PM forums: Ongoing evaluations of HDM and securing adherence to best practices	• Handbook: integration with project models • Experts and master on HDM are established for mentoring and training • Reinforcement of HDM 'culture': ascertain the use of HDM jargon and synchronization with PMs satisfaction and impact • Integration of HDM approach in the creation of new business opportunities

Figure 1. Implementation timeline of HDM in Topsoe's R&D department

HDM trained project managers to provide a common understanding of how R&D projects are designed and executed as well as to encourage the methodology's widespread use across the organization. An overview of the timeline of the implementation of Half Double Methodology is illustrated in Figure 1 above.

4.2 Local Translation and implementation

A core aspect of the Half Double Methodology (HDM) is the notion of Local Translation, which posits that the methodology must be adopted to fit the organization. Hence, in order to achieve the desired benefits from the methodology, adaptation and implementation should accommodate the needs of the organization, its culture, and its systems. For more information on how HDM approach local translation, see the HDM website where you can access the HDM pocketbook (halfdoubleinstitute.org).

In Topsoe R&D, Local Translation of HDM is illustrated with the implementation of additional elements like risk management and the further modification to fit other process management procedures, like stage gate systems, and the general organizational structure. Therefore, this section describes how Topsoe R&D has implemented HDM in projects, and how they have adapted and translated it to their specific needs.

A strength of HDM is its flexibility. Topsoe R&D has used the methods and tools from HDM to create the '6 best practices', which are visualized in Figure 2. Topsoe R&D has for example incorporated the impact case and pulse check as part of the 6 best practices, whereas methods like co-location and impact solution design are not directly represented. However, both methods are presented in their project handbook as tools for project execution, where all 9 Half Double methods are presented. Topsoe R&D has also incorporated their organizational structure in the 6 best practices. As previously mentioned, R&D projects in Topsoe have both a project manager, an impact owner and a project owner. This is incorporated in two of the practices that ensure clear roles and responsibilities as well as alignment of impact and deliverable creation between the impact owner, project owner and project manager.

The main takeaway from the 6 best practices is the approach to the translation, where individual HDM elements are incorporated in Topsoe R&D's own 6 best practices. The reasoning behind condensing 9

Figure 2. 6 Best Practices in Topsoe R&D

practices down to 6 best practices was to make the methodology more acceptable and useful for the employees, which in turn has increased the use of the methodology in the execution of the projects. This addressed an issue where not all tools and principles were consistently used in the beginning.

Topsoe R&D has also added elements e.g. risk and uncertainty management and an objective hierarchy. For example, when there is high uncertainty, Topsoe R&D recommends project leaders to focus on the project's impact and the level of changed behavior. Under high uncertainty the focus thus lies on tracking impact via the impact case together with the impact solution design and making sure stakeholders are satisfied via pulse checks. On the other hand, in low uncertainty projects, the focus must be on accelerating project deliveries with an optimized flow.

Further, Topsoe R&D has modified the Half Double Methodology to work with the existing stage/gates system, so that it supports working towards initial impacts inside each phase. Topsoe R&D used HDM to create more frequent project iterations in each phase, with different cycles focusing on Flow, Leadership and Impact. Phases vary in length from a few months to over a year. See figure 3 below.

5 Half Double projects in Topsoe R&D

In the next section, we briefly describe the Half Double projects and the project organization in Topsoe R&D, before we turn to comparing these projects in section 6.

5.1 Project organization in Topsoe R&D

Topsoe R&D projects follow an overall organizational structure, where roles and responsibilities are clearly defined. Every project is thus designed with a project owner, a project manager as well as an impact owner, and this organizational structure is reflected in two of Topsoe R&D's 6 best practices. The R&D projects use 3 different project models, depending on whether the projects aim to develop a new catalyst, develop technology, or whether the projects are more business minded with a commercial scope.

5.2 Topsoe R&D's Half Double projects

The Half Double projects in this study using HDM are all R&D projects. The projects mostly concern developing and optimizing various catalysts for renewable fuel production from biobased oils and for other petrochemical products, whereas one is a change project. This specific project, Half Double project 5, still operates within the R&D framework, as the project aims to establish a common project leadership methodology in all R&D projects in Topsoe. Further elaborations are presented for each project in table 1 below.

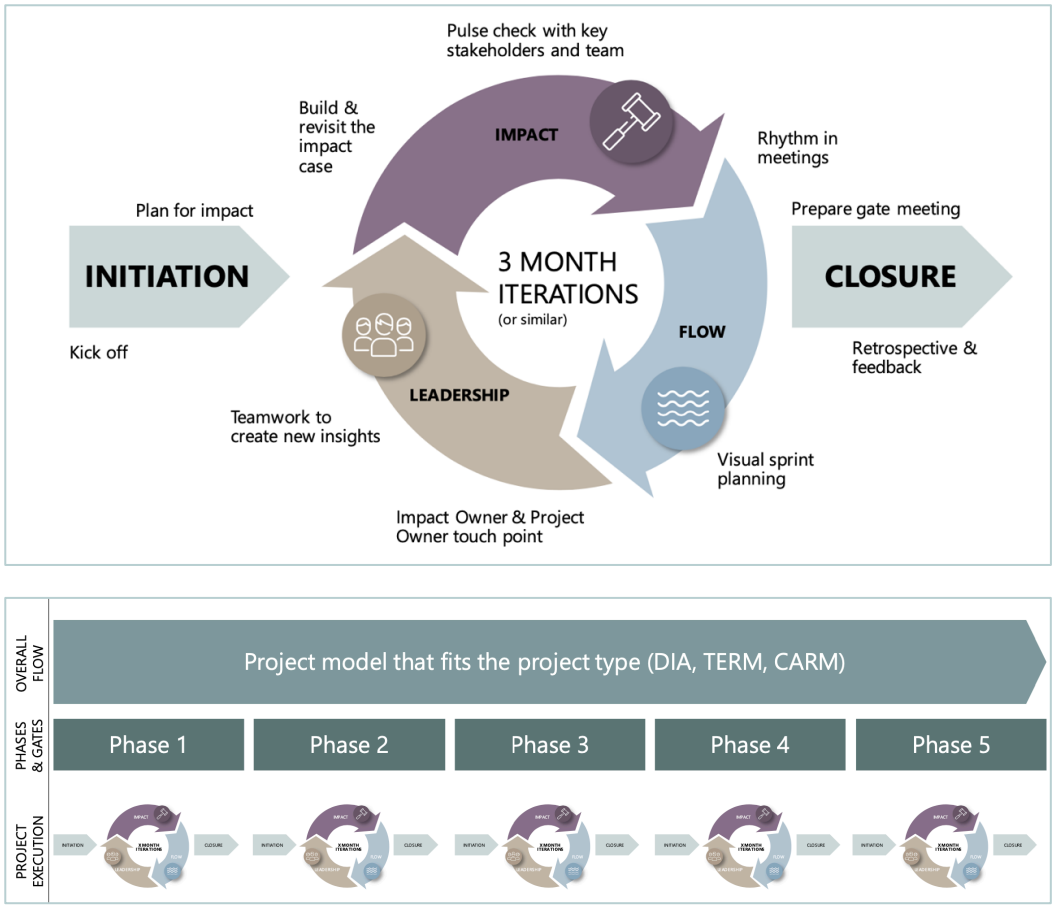

Figure 3. Three-month iterations and how they structure different project phases

HD PROJECTS	DESCRIPTION
1: Dewaxing catalyst development **2: Hydrocracking Catalyst Development** **3: New HDO Catalytic System** **4: MOSAIK Bioglycols**	HD Projects 1-4 are technical projects. Topsoe R&D's technical HD projects mostly concern developing and optimizing various catalysts, but one also focuses on process development. The catalysts are both for renewable fuel production from biobased oils and also for other petrochemical products such as plastics, synthetic fabrics and components for cars. The technology in the area of renewable fuels is still new, so Topsoe R&D initiated these projects on the base of an increasing global demand for such catalysts minded towards renewable fuels. One project is also heavily focused on developing a new process for conversion of sugar into bioplastic.
5: HD+	Half Double project 5 is a change project in contrast to the other HD projects. This project was initiated to accelerate Topsoe R&D projects, facilitate HDM implementation and strengthen project leadership capability.

Table 1. Project descriptions

6 Topsoe R&D projects in a comparative perspective

This section examines HD projects in Topsoe R&D from a comparative perspective. First, we compare the Half Double projects with other reference projects in Topsoe R&D, which do not use HDM. Secondly, we compare Topsoe's HD projects to other organizations' HD projects. We compare on project characteristics, such as complexity, organizational conditions and technological level. We also compare on scores of HDM practices and on the project' success.

6.1 Internally – comparing Half Double and reference projects

In this section we compare the characteristics of Topsoe R&D's HD projects and reference projects. The characteristics are visualized in the radar diagram below (figure 4).

Comparison of Project characteristics

Projects' characteristics and their surroundings have an obvious impact on project performance and on the implementation of project management models such as HDM. Comparing these characteristics thus serves to give an indication for the conditions for project success related to both performance and management.

Overall, our findings indicate that Topsoe R&D's HD projects are slightly more advanced and have more unknowns and challenges to tackle compared to the reference projects, thus potentially impacting the implementation of HDM and the projects' success. The HD projects require slightly more innovation, higher levels of technology and

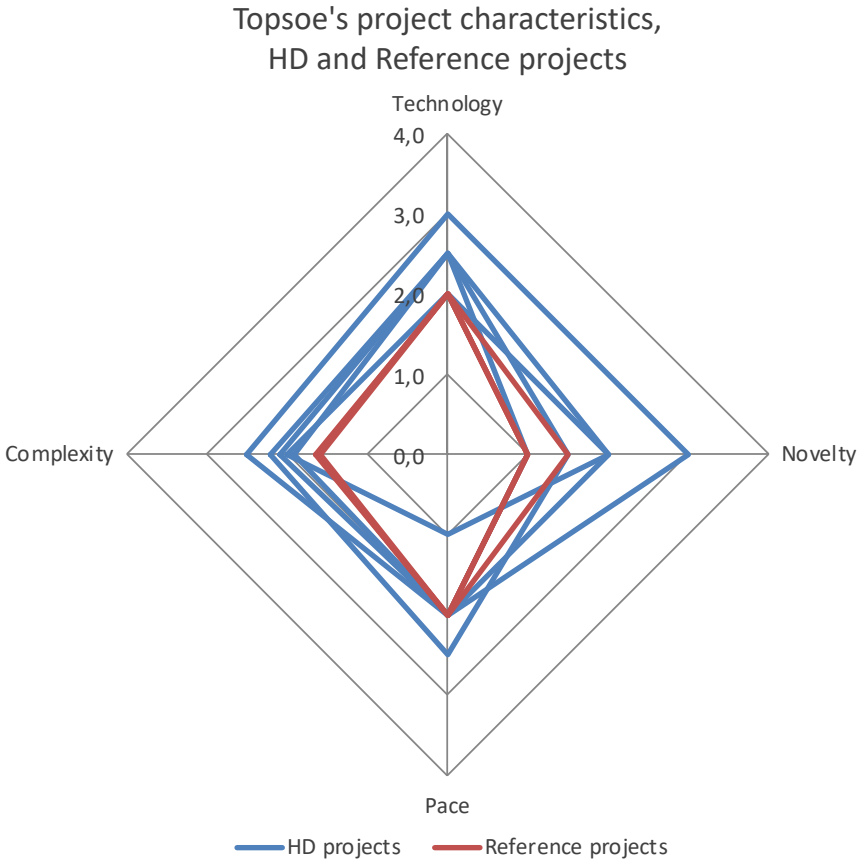

Figure 4: Project characteristics, Topsoe R&D's HD and reference projects

Note: HD projects: *n* = 5; reference projects: *n* = 4. Differences are heavily driven by one project, which differs substantially in characteristics and resources from the other HD projects. The differences reported in section 6.1 do not take this project into account, and when included, the differences increase considerably.

have more complex political and organizational conditions. The HD projects also use slightly more resources, both in budget and manhours. On the other hand, the time constraints and pace in the projects are slightly more varied across HD and reference projects. We elaborate on the effects of these characteristics for success in section 6.2.

Comparison of HDM practices

In the comparison of Half Double Methodology practices, we rely on the HDM scorings. These scorings assess the extent to which a project applies the tools and methods within the core elements of Impact, Flow, and Leadership – for example, the use of the Impact Case. The scores are based on the project manager's own assessment on a scale from 0 to 4.

When comparing Half Double Methodology practice scores across HD projects and reference projects, it might seem obvious that HD projects achieve higher HDM scores. Confirming this, on an overall average, Topsoe R&D's HD projects score 35% higher in all HDM practices compared to Topsoe R&D's reference projects. See 'Overall' in the boxplot below. On a more general level, this difference implies a behavioral change, where the implementation of HDM has increased project standardization in planning and communication. Thus, the approach to project execution has been aligned across projects with HDM, and it generally shows that HDM has been effectively implemented in the HD projects. See Topsoe R&D's project scores across HD and reference projects in the boxplot below. Table 2 below provides a guide on how to read boxplots.

READING THE BOXPLOTS
The box shows where most of the scores are (the middle 50% of all responses). When the box and lines (whiskers) are placed toward the higher end of the scale, it means that most participants gave high scores. A longer box or whiskers mean that the scores vary more (greater spread), while a shorter box or whiskers mean the scores are more consistent (less variation). The line inside the box is the middle score (median), while the "X" shows the average score. The lines ("whiskers") show how the remaining lower and higher scores are spread.

Table 2: Reading the boxplots

Going into further detail, some areas of HDM have been more effectively implemented than others. On the one hand, Topsoe R&D has made the largest changes and improvements in the core elements of Impact and Flow. In Impact, Topsoe R&D has remarkably increased the alignment of the project and stakeholders' interests. This is done through

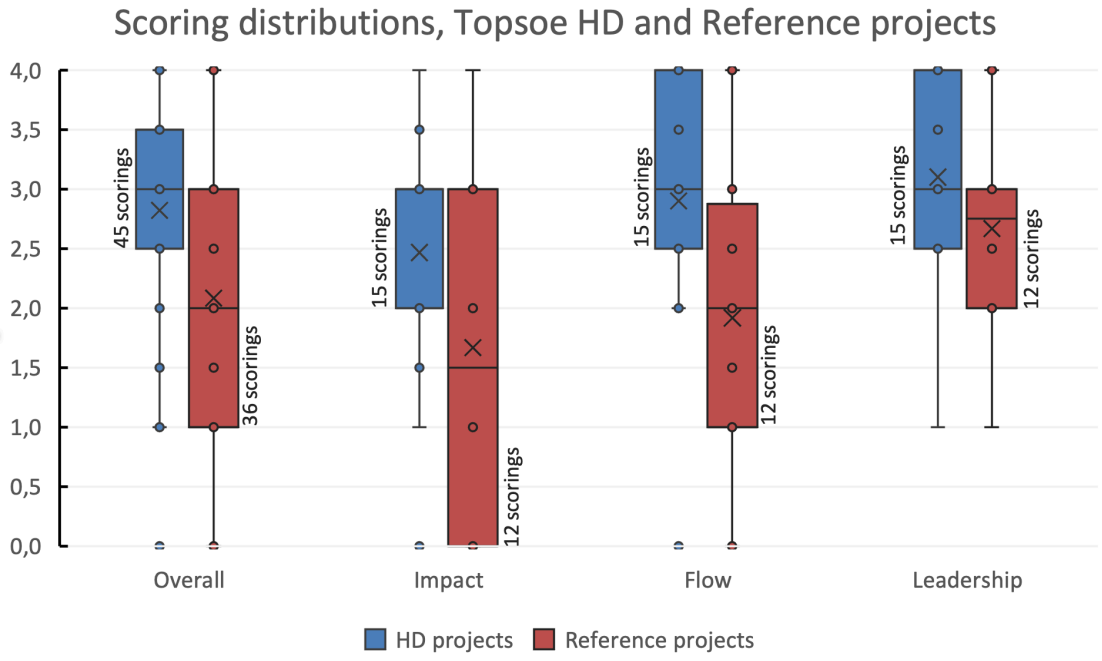

Figure 5: Boxplot of HDM scoring distributions, Topsoe R&D's HD and reference projects

Note: HD projects: *n* = 5; reference projects: *n* = 4. For a guide on reading the boxplots, see table 2 above on this page.

weekly informal catchups and a continuous focus on behavioral impacts. See both the section on benefits and stories, for examples on how Topsoe R&D has used HDM to create alignment (section 7). In Flow, HDM has increased visualization in the project teams and their workspaces. HDM has also helped projects in setting up regular meetings, enhancing co-ordination and communication. On the flipside, Topsoe R&D project managers also report that better and more communication also requires more time (see benefits and drawbacks, section 7).

The implementation of HDM has, on the other hand, made a smaller difference when it comes to Leadership. As such, project owners are actively engaged across both HD and reference projects. Topsoe R&D project managers also seem to have found a good balance between traditional and more humanistic leadership styles with HDM. As we will later show, leadership is generally very proficient in Topsoe R&D, also compared to other organizations, likely explaining why HDM has made a smaller difference here. There is one aspect in leadership, where HDM has made a considerable difference: Topsoe R&D project leaders also report having made a more substantial effort in actively customizing HDM compared to the project models in the reference projects. However, we remind you that the evaluation of Leadership is done by the project leaders, likely biasing results.

6.2 Externally – comparing Half Double projects in Topsoe R&D and other organizations

With HDM having made a clear difference between HD and reference projects, we now compare Topsoe R&D's HD projects with other organizations' HD projects. Our data consists of Topsoe R&D's 5 HD projects and 28 HD projects from other organizations. See figure 6 below.

Half Double practices in Topsoe R&D and other organizations

Comparing Topsoe R&D's HDM scores with other organizations sheds light on implementation levels, and thus project standardization, relative to other organizations. Overall, all of Topsoe R&D's HDM scores are on average found to be very close to other organizations, with Topsoe R&D scoring only 3% lower.

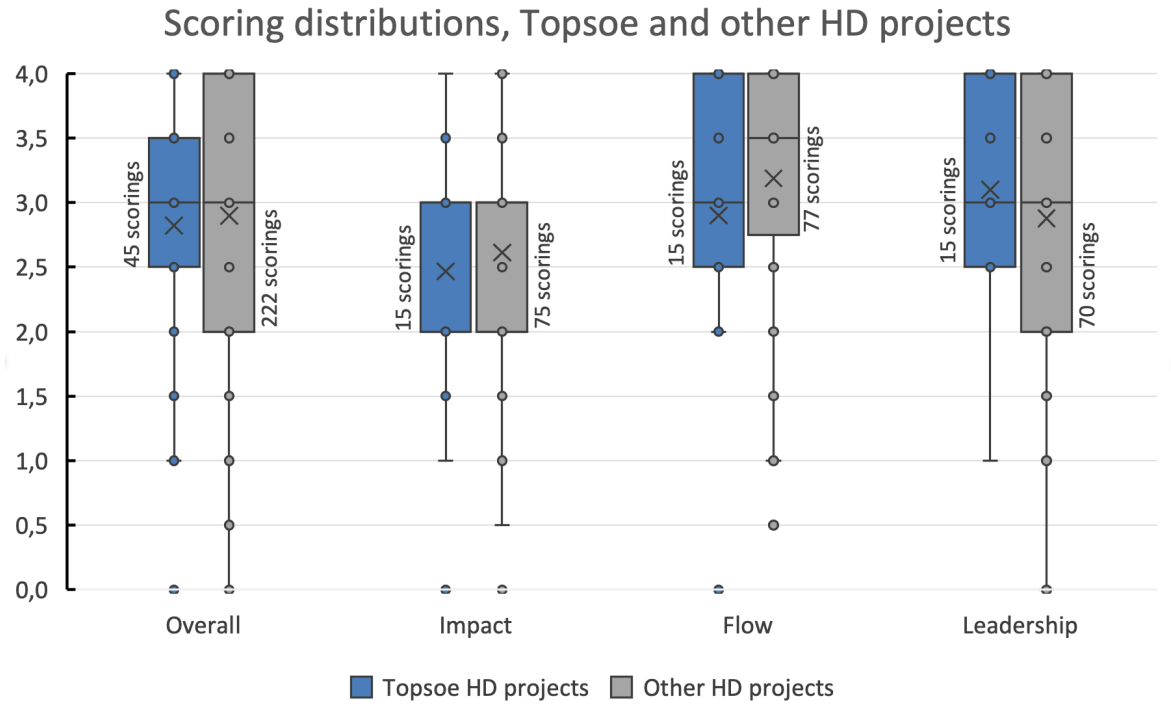

Figure 6: Boxplot of HDM scoring distributions, Topsoe R&D's and other organizations' HD projects

Note: HD projects: *n* = 5; Other HD projects: *n* = 28. For a guide on reading the boxplots, see table 2, page 10

As we highlighted earlier, Topsoe R&D is very proficient in Leadership, a core element of HDM where Topsoe R&D's HD projects outperform other HD projects. Project owners in Topsoe R&D are especially more actively engaged compared to other organizations. On the other hand, HD projects in Topsoe R&D perform slightly behind other HD projects in the areas of Impact and Flow with mixed results. In Impact, Topsoe R&D is more successful in using HDM to stay aligned with stakeholders and breaking down impacts in business and behavioral impacts. However, Topsoe R&D has more difficulty in using the Impact Solution Design tool to extensively plan for impact.

In the core element of Flow, Topsoe R&D faces more challenges with collocating project teams compared to other organizations. This is likely due to several factors, including the high number of parallel development projects, reliance on development learning loops that require access to test personnel, and technical limitations within available facilities. In addition, key competencies are spread across laboratories located far apart, further complicating colocation. Rather than accepting these constraints as fixed, project managers are encouraged to actively reflect on and adapt their approach to colocation – seeking solutions that fit the local context and support collaboration despite structural barriers.

Topsoe R&D also reports using visual planning less compared to other organizations. Topsoe R&D outperforms other organizations when it comes to using HDM to set up a fixed pace with regular meetings and efficiently running projects. Even before HDM, Topsoe R&D had great success in using the existing gate process system to establish efficient workflows, which is generally in line with Topsoe R&D's project-minded way of operating and doing business; something Topsoe markets itself on and has extensive experience with and expertise in.

Addressing these mixed results, two points are worth highlighting. First, Topsoe R&D's project managers are already aware of the further potential within Impact Solution Design and are actively working to strengthen this area. Second, while colocation is challenged by access to test personnel and facility constraints, HDM encourages project managers to critically reflect on these barriers and adapt their collaboration strategies, rather than treating such conditions as fixed. The challenge with co-location primarily accounts for the slightly lower Flow score observed in the scoring distribution. When adjusting for this factor, Topsoe R&D's HD projects slightly outperform other HD projects in Flow.

As such, Topsoe R&D thus excels in Leadership, performs similarly in Flow and lags only behind in Impact, with a clear improvement opportunity already recognized in Impact Solution Design.

Half Double and success in Topsoe R&D and other organizations

As part of our external comparison, we evaluate the HD projects in Topsoe R&D and other organizations in relation to success. Success data from Topsoe R&D cover 3 HD projects and 3 reference projects. From other organizations we have success data from 27 HD projects. We should add, our data is limited and biased, so any conclusions regarding success should be made with caution.

The overall success rate with HD projects in Topsoe R&D is 72% and 59% with reference projects, a positive difference of 13 percentage points. Other organizations' average success rate with HD projects is 81%, thus amounting to a negative 9 percentage point difference between Topsoe's and other organizations' HD projects. Topsoe R&D's lower success rate is primarily due to one lower scoring project. Two other HD projects are highly successful: one achieves an average success rate of 82% on KPIs. Both technical and commercial goals were achieved. As such, the project was successful in optimizing the utilization of chemical materials which lead to a positive commercial impact. The project also succeeded in behavioral aspects with leadership being more physically present and with feedback loops used more during testing.

Another successful HD project in Topsoe R&D achieves an average success rate of 92% on KPIs. The project was commercially successful by offering unique solutions and better performing reactors. Behaviorally, the project was also

successful in achieving a better usage of HDM practices: The project teams continually reviewed the impact case which increased alignment of both project teams and stakeholders. This helped in adapting to changes in the market.

Looking at the broader trend, our evaluation reveals a weak but slightly positive correlation between the total HDM scoring and the success of the projects. Following this trend, our data show that, going from the lowest total HDM score to the highest increase success from 75% to 84%. We reiterate our imperfect and biased data when considering this relationship.

Success and project complexity in Topsoe R&D and other organizations

Apart from our imperfect data explaining our weak relationship between HDM scorings and success, the projects' characteristics and complexity also likely play a role; on a general level, our evaluation finds a pronounced negative relationship between the projects' characteristics (complexity, innovation, technology level etc.) and success. Following this trend, our data show that, going from the lowest complexity to the highest, success falls from almost 92% to 67%, a decrease of close to 25 percentage points (see figure 7 below). We stress that this relationship is not considering the role of uncertainty, which could influence the results of the comparison as it is correlated to both complexity and success.

Despite of this relationship, our data also show how two of Topsoe's HD projects handle this complexity well: These two projects are situated close to the average complexity, yet they achieve above-average success rates. Also, going back to the characteristics of Topsoe's HD and reference projects, our data further show how HD projects in Topsoe R&D handle complexity; While the HD projects are more advanced and have more unknowns, they still outperform and achieve higher success rates compared to the reference projects, which in turn score lower in characteristics such as complexity, technology level and organizational conditions.

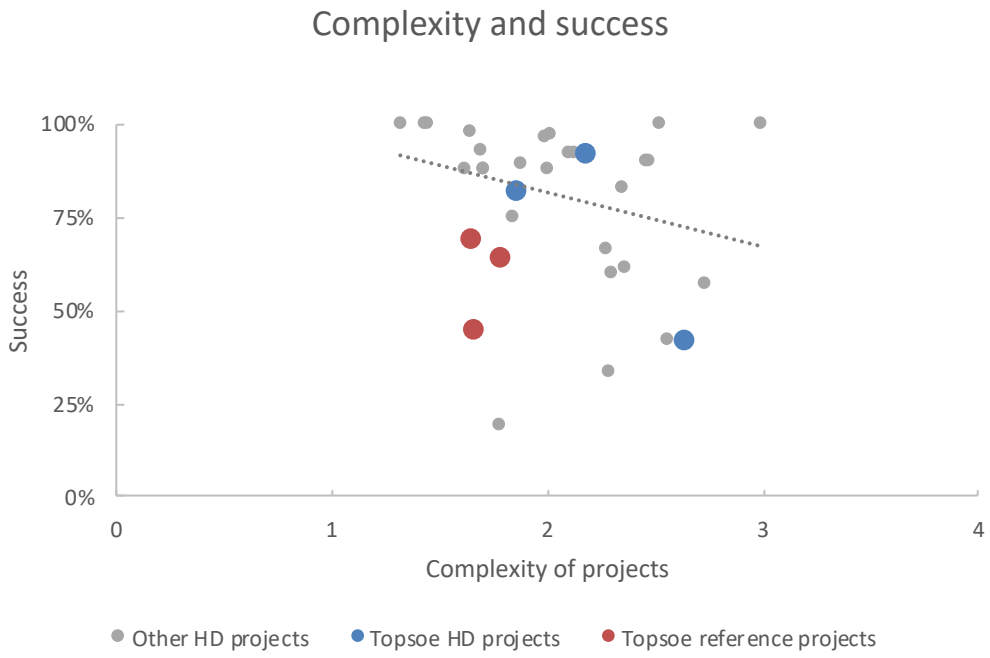

Figure 7: Complexity and negative correlation with success

Note: Topsoe HD projects: *n* = 3; Topsoe reference projects: *n* = 3; Other HD projects: *n* = 27. The trend line is not fitted with inclusion of Topsoe's R&D projects and displays the trend for "Other HD projects". Topsoe's R&D projects are show for comparative purposes, and their inclusion does not change the trend in a substantial way.

6.3 Four takeaways from our comparison

Based on comparisons with both internal reference projects and HD projects in other organizations, our conclusions are as follows:

Firstly, Topsoe R&D's HD projects show a substantial positive difference in HDM scorings compared to reference projects, indicating that the Half Double Methodology has been effectively implemented. This indicates substantial improvements in project workflow and communication flow as well as increased alignment between project teams and stakeholders.

Secondly, compared to other organizations, Topsoe R&D is overall on the same level in implementing HDM. Topsoe R&D excels in active project ownership and is more successful in using HDM to stay aligned with stakeholders and breaking down impacts in business and behavioral impacts. Topsoe R&D's expertise in running projects efficiently also stands out.

Thirdly, Topsoe R&D's HD projects achieve higher success rates than Topsoe R&D reference projects, but Topsoe R&D is slightly behind on success compared to other organizations. HDM scorings show a weak positive relationship with success. Our data on success is biased and limited, so our final conclusions here should be taken with caution.

Finally, a likely explanation for the weak association between HDM and success is complexity. The relationship between success and the projects' complexity, technological level and organizational conditions shows a substantial negative correlation. This suggests that while complexity cannot typically be reduced, prioritizing less complex projects may improve success rates.

7 Experience with HDM and stories in Topsoe R&D

In this section, we highlight Topsoe R&D's experiences in implementing the Half Double Methodology, covering benefits, challenges and stories from project managers.

7.1 Benefits of HDM in Topsoe R&D

Here, we cover benefits and challenges with HDM. The benefits mentioned from Topsoe R&D's project managers point to all areas of HDM, thus covering both impact creation, enhanced workflow and increased leadership engagement and team spirit. 6 points are worth mentioning:

1) **Role clarification** – The implementation of Half Double Methodology has made decision-making easier with clear roles for the team members. Role clarification has also helped to engage leadership in the goals of the project.
2) **Quality assurance** – HDM has improved communication and information flow and has thus helped to increase quality assurance in the projects. This also improved the workflow in the projects, which resulted in less interruptions.
3) **Alignment and behavioral change** – The impact case was successful in establishing and defining impact goals, which helped to create alignment from project teams and stakeholders. This also helped to involve stakeholders more. Together, these effects drove behavioral change in both project teams and stakeholders.
4) **Flexibility –** Topsoe R&D project managers also highlighted the flexibility of Half Double Methodology, which helped in the translation process of fitting HDM into Topsoe R&D's systems, workflow and culture. This flexibility and ease of translation made it possible to adapt the methodology to a wide range of projects.
5) **Increased team spirit** – Topsoe R&D has used HDM to create more clarity in project goals, which has helped project teams to become more aligned; the team spirit has grown stronger in turn.
6) **Faster reaction times to the market** – The above benefits have in combination made Topsoe R&D able to react more quickly to demands in the market.

7.2 Drawbacks of HDM in Topsoe R&D

Even though project managers in Topsoe R&D in general are satisfied with HDM, no project methodology solves all kinds of problems; Half Double Methodology has also had its challenges for Topsoe R&D. Topsoe R&D has in turn sought to address some of these problems in their own way. As HDM is still relatively new in Topsoe R&D, some challenges are also likely to be improved over time. Employees become familiar with the methodology, meetings go smoother, and resistance might reduce. The 4 most important challenges for Topsoe R&D have been:

1. **Tools, small groups and anonymity** – Some HDM tools compromises anonymity in small groups. E.g., in smaller groups it is easy to identify 'who said what' during Pulse Checks. Topsoe R&D addressed this problem with more informal Pulse Checks.
2. **No tool for handling uncertainty and risk** – HDM compromises flexibility for comprehensiveness, thus lacking in some project management areas like risk and uncertainty management. Topsoe R&D has addressed this by tailoring different HDM elements to high and low uncertainty situations. See section 4.2 on local translation for elaboration.
3. **Resistance towards new methodology** - As with any new 'idea' or approach in an organization, resistance of some form is expected. Topsoe R&D has also encountered organizational resistance towards the implementation of HDM, as the methodology has been seen as taking credit for an already established and well-functioning project approach and culture. See stories, section 7.3.
4. **HDM meetings and time consumption** – Getting HDM to work well in Topsoe R&D has required many meetings. The many meetings have been a further challenge for team members if they have been allocated for less than half of their working time on a single project. This has also made it more difficult to 'catch up' on tasks in the project. Additionally, the hours spent on meetings has reduced the hours available for primary tasks in the project.

7.3 Stories from project managers in Topsoe R&D

Here we present four 'stories', covering substantial points from project managers in Topsoe R&D on Half Double implementation in the organization.

Team and impact alignment go hand in hand

Earlier we highlighted the benefits of HDM in aligning on impact creation and goals. In the teams, this happens firstly because HDM helps structure collaboration and facilitate interaction between employees in a practical and regular way. Secondly, this also serves to help the employees lift their heads and look up from their individual tasks, and get a view for the project and the rest of the team in a more holistic way:

"One of the benefits [of HDM] is better communication and information flow... We also get to know the project team better... You see the bigger goal more clearly... Instead of focusing on the small things we do on a daily basis, we are more focused on the project's goals"
-Topsoe R&D Project Manager

Successful local translation relies on trust in employees' capabilities

An important factor in successfully implementing Half Double is local translation, the process of adapting the methodology to fit the organization's systems, values, and culture. This partly requires a bottom-up approach, where employees' capabilities and perspectives are central. Since there is no standard manual for translating Half Double, success depends on the ability of employees and teams to interpret and adapt its principles meaningfully. If their skills and values are overlooked or not trusted, resistance is likely. Trust means giving employees the autonomy to interpret and adjust the methodology in ways that best fit the local context based on their expertise. Fortunately, the flexibility built into the methodology supports this process, allowing employees and project managers to tailor its use to the team's strengths and needs:

"[...] you're 'allowed' to adapt the Half Double Methodology to your needs. That's why I believe the methodology has a chance to succeed in Topsoe. Topsoe is a company with an incredible number of highly skilled employees who are the best in their fields. They hate it when someone comes in and says: 'Do this and everything will be fine'... Half Double says: 'Here's a set of tools, and you can decide what to use and how to use it'. That flexibility fits well with the company's culture."
- Topsoe R&D Project Manager

Lack of recognition creates organizational resistance

As we have highlighted, local translation relies on trust in employees' abilities, but it also depends on recognition. Trust and recognition go hand in hand – can you truly trust your employees without recognizing their needs, capabilities, and values? Recognition means valuing employees' unique insights, experiences, and existing knowledge. This underscores the importance of acknowledging well-established and effective practices and their similarities with the new methodology, ensuring that credit is not taken away from existing practices or experienced employees. Recognizing this helps reduce resistance or prevent unnecessary pushback. It is also important to recognize when the methodology offers no significant improvement or lacks certain aspects:

"The nomenclature creates resistance. You call a series of project meetings 'Rhythm in Key Events'. People say: 'We're just doing something completely normal!'. And that's exactly the point – you're doing something that isn't disruptive, but now it's 'invented' by Half Double. The old-timers say: 'Ohhh, Half Double! So, we're supposed to work twice as much in half the time!'"
- Topsoe R&D Project Manager

Challenges and successes with the Impact Case

Working with the core element of Impact has had both its challenges and successes for Topsoe R&D. Regarding the Impact Case, many projects used business cases extensively before HDM, so the notion of business impact is well known. Several projects also find the Impact Case highly useful for communicating goals to management. On the other hand, the behavioral aspect of HDM's Impact Case is new, with several projects improving on this aspect; After it was underlined that work was needed on improving the Impact Case and using it the best possible way, one project manager was successful in using it to drive behavioral change for stakeholders:

"Stakeholders were not used to run the project the Half Double way and to continually discuss the impact. The impact case drove behavioral change in the stakeholders to accommodate to the project and continually discuss the results of the project"
- Topsoe R&D Project Manager

8 Conclusion

Overall, Topsoe has thus used Half Double Methodology to improve project work and communication flow, increase alignment between project teams and stakeholders and help project managers balance leadership styles. By using HDM, Topsoe R&D benefits from stronger leadership engagement, enhanced team spirit, and improved quality assurance to name a few. Projects in Topsoe R&D which use HDM achieve higher success rates compared to projects which do not use HDM, and Topsoe R&D is only slightly behind on success rates with HDM projects compared to other organizations. HDM is not without drawbacks in Topsoe, the main ones being a lack of built-in tools for managing risk and uncertainty, organizational resistance and a high meeting load.

Despite of these challenges, HDM has overall helped create a more holistic perspective on both

projects and project teams, where autonomous and experienced employees have enabled effective interpretation and adaptation of the methodology to local conditions in Topsoe R&D.

Compared to the beginning back in 2020, Topsoe R&D has come a long way towards establishing a more comprehensive and uniform approach to project management with the implementation of HDM. Now, the final consolidation of HDM is ongoing, with focus on reinforcing HDM culture and integrating the HDM approach in the creation of new business opportunities.

References

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