Forming Strategic Alliances: A Study on Start-Up Collaborations with Corporate Giants

Case Study of Delft Offshore Turbines and Comparative Analysis of Industry Practices

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Forming Strategic Alliances: A Study on Start-Up Collaborations with Corporate Giants

Case Study of Delft Offshore Turbines and Comparative Analysis of Industry Practices

Thesis report

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Executive Summary

Many startups struggle to acquire significant market share and secure growth partnerships. Existing literature often lacks startup perspectives, creating a gap in guidelines for new ventures. This case study investigates Delft Offshore Turbines (DOT) strategies alongside nine additional interviews to identify key factors for successful partnerships. Market research and SWOT analysis for DOT's slip-joint technology revealed strengths and opportunities related to innovation and wind turbine demand, but weaknesses and threats in the Dutch wind turbine industry and existing partnerships.

A conceptual framework was built based on the findings from literature and theories such as Technology Commercialization, Resource-Based View (RBV), Transaction Cost Economics (TCE), and Open Innovation. Comparison with DOT's strategies showed partial alignment with the theoretical framework, but significant mistrust with the current partner and industry-specific factors suggested exploring alternatives like a Joint Venture (JV).

To better understand the specific factors startups employ in forming partnerships, a comparative analysis with eight additional startups identified primary factors such as customer feedback, balanced approaches, and strategic partnership models. Secondary factors included IP protection, preparedness, and adaptability. These findings underscore the importance of strategic partnerships for startups' growth and highlight the need for trust-building and adaptive strategies within dynamic industry landscapes. Addressing gaps in the current literature on startup perspectives, this study identifies limitations and suggests future research to explore these themes more comprehensively, enhancing startup success in partnership strategies.

Keywords: Startup dynamics, collaboration, joint venture, case study, startup partnerships, TUDelft interview, Technology Commercialization, Resource-Based View (RBV), Transaction Cost Economics (TCE), Open Innovation

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Chapter 1: Introduction

1.1. Background and context

Startups are not just a modern business trend–they are catalysts for job creation, self-employment, and technological advancement across diverse industries (Mettler & Williams 2011). Initially viewed as threats by incumbents, startups have evolved into vital partners driving innovative ventures Ching and Caetano (2021). The Startup Genome report from 2020, which highlighted their expanding significance, showed that, as of 2019, the global startup ecosystem had generated a staggering $3 trillion in value. This dynamic capability enabled startups to adapt to rapidly changing markets, such as the clean energy sector (Farhana & Swietlicki 2020). Since 2020, investments have increased by 40% in response to the growing demand for clean energy (International Energy Agency 2023). Among various clean energy solutions, wind energy stands out for its performance and cost efficiency, making it a key beneficiary of supportive government policies. This pushes energy giants to transition to greener alternatives, which increases competition in the wind power industry. With their flexibility and willingness to try new things, startups, as opposed to incumbents, are uniquely positioned to capitalize on these emerging trends, taking the lead in the transition to clean energy.

1.2. Research problem

Incumbent firms, with their established brands and strong asset bases, have long-standing relationships with crucial stakeholders such as producers and customers. However, they often envy startups for their agility and adaptability (McKinsey 2022). Startups can help larger firms mitigate the downsides of their static nature through their creative technology (Shan 2023). While they possess great potential, startups have fewer resources and shorter track records, which present substantial hurdles. Acknowledging these constraints, startups must strategically position themselves to pioneer market changes or establish new markets by becoming the principal providers of supplementary goods and services. Theories such as Resource-Based View (RBV), Open Innovation, Technology Commercialization, and Transaction Cost Economics underscore the importance of collaboration and co-creation between firms. These theories will be further discussed in section 2.1. Although these collaborative techniques are acknowledged, a knowledge gap persists in identifying the key factors and challenges specific to startups. As shown in section 2.2, this study includes a wide range of scholarly papers and research articles on this topic. Most research in this area has been conducted from the perspective of incumbent firms to provide a comprehensive understanding of their actions and the selection choice of smaller firms. This study aims to fill this gap by exploring how startups can launch and form successful partnerships.

1.3. Research objective and Questions

The main objective of this research is to better understand the dynamics, key factors and strategies involved in the alliances between startups and incumbents. By employing a case study of the startup Delft Offshore Turbines (DOT) and a comparative analysis of eight additional startups, this study aims to find answers on how can startups form and sustain strategic partnerships with large companies to successfully commercialize their innovations. In doing so, this study hopes to fill a gap in the existing literature and serve as a guide for startups.

Furthermore, the results of the DOT case study will address a real-life problem related to DOT's current partnership structure. DOT specializes in a groundbreaking wind turbine installation method called ''slip joint'' that can potentially attract many incumbent firms and catalyze the creation of a new market with its resource-, cost-, and time-efficiency. This technology has the potential to be the driving force of transformational pathways in the wind turbine installation

processes. However, the commercialization efforts of DOT have not been successful due to their current partnership method hindering the expansion of this technology. The hindrance in the commercialization of such a promising technology underscores the importance of understanding the nuances of partnership strategies. Therefore, the findings of DOT's case study will provide valuable lessons for other startups that are facing similar challenges. The analysis will address DOT's issue by evaluating potential partnership options for DOT.

In addition, eight additional startups will be interviewed to specifically identify the contributing factors to partnerships. This will provide a broader perspective of the results, making them more applicable for other startups.

1.4. Structure of the Thesis

This research is divided into two main parts. While the first part of this research focuses on DOT's case study, the second part will focus on a comparative analysis between eight additional startups.

Before the two main parts of this study, the available theoretical frameworks such as Open Innovation, Resource-Based View theory, Transaction Cost Economy and Commercialization Theory were studied. Furthermore, a literature review was conducted to help the identification of the knowledge gap and current views on startup-incumbent partnerships. By including an analysis of the current collaboration options of startups, an overall conceptual framework was formed to guide this study.

Dot's case study began with a short market and company analysis based on available data online to describe the dynamics of DOT and the wind turbine industry. Further, an interview with DOT's founder Jan Van Der Tempel was conducted to include further details on their goals, ambitions and reasoning for their current strategic choices. The findings were gathered in a SWOT analysis. The findings of the conceptual framework were evaluated for DOT's case.

The second part of this study will be on the comparative analysis between eight startups from various industries. This part had two interview rounds where the first 6 startups were interviewed about their experiences on the topics of productivity and risk assessment, learning from experience, communication and alignment, exit strategies, startup dynamics, and suitability for collaboration. The second round of interviews were conducted with two additional startups to confirm the findings of the first round. The findings from these interviews were then assessed and a reflective

analysis was conducted to conclude the possible implementations for DOT and the limitations of this study.

Startup strategies are examined as instrumental mechanisms for achieving sustainable growth and orchestrating an alliance creation. The qualitative nature of this inquiry allows an exploration of the strategic complexities in the employment of collaboration methodologies. The overall goal is to contribute valuable insights to this topic from the less researched perspective of start-ups using both a case study with DOT and a broader approach with other companies from different fields.

2

Literature Review

This chapter aspires to provide a comprehensive overview of the latest state of knowledge related to startup-incumbent partnerships and the commercialization of innovations. The scope of this literature review includes the examination of various theories along with existing studies. These existing studies help this thesis highlight the dynamics of start-up incumbent dynamics by focusing on the challenges and benefits that rise from these partnerships. By synthesizing existing research, this literature review aims to identify the theoretical frameworks and the gaps in the literature that illuminate the research question of this thesis. This chapter will begin with an analysis of the theoretical framework, followed by a review of the existing literature and analysis of different collaboration methods. The final section of this chapter will focus on building a conceptual framework synthesized from the findings of the literature review. This section will help this study to build a structured approach to analyze the dynamics of startup-incumbent dynamics and commercialization of innovations.

2.1. Theoretical Framework

This section aims to help the reader understand the relevant theories of the dynamics of startup-incumbent partnerships and the commercialization of Innovations. The theories that will be discussed in this section are Technology Commercialization, Resource-Based View (RBV), Transaction cost Economics (TCE), and Open innovation.

2.1.1. Technology Commercialization

The theory of Technology commercialization highlights the important stages of a new technology's development, market introduction and adoption. It emphasizes understanding the market needs, forming strategic alliances, IP management and funding. Composed of different stages such as idea generation, production and development, marketing and surveillance after market introduction, Technology commercialization is an important theory to understand for Startups to commercialize their technology (Teece 1986). As suggested by Wakeman (2008), commercialization theory helps firms to leverage strategic assets and complementary capabilities. Their research refers to the technology commercialization strategy of Teece (1986) and presents a game-theory model that focuses on leveraging the possible knowledge gains from a firm's complementary activities for future products.

2.1.2. Resource-Based View (RBV)

The RBV theory suggests that competitive advantage can be achieved by firms possessing valuable, non-imitable and non-substitutable resources (J. Barney 1991). RBV theory suggests that unique resources and competencies are the primary drivers of a firm's performance. This theory allows firms to shift their focus from external market conditions to their internal capabilities. Ten years after their first research, Barney (2001) further developed the RBV theory by including various insights from different fields which allowed them to emphasize on the strategic importance of intangible assets. Among these assets, they identified knowledge, brand reputation and IP. The implications of this theory were also in line with the findings of the empirical study of Wernerfelt (1984) which demonstrated that firms with differentiating resources achieved superior performance.

2.1.3. Transaction Cost Economics (TCE)

Developed by Oliver Williamson, the TCE theory postulates that minimizing exchange costs is pivotal for economic efficiency. The theory emphasizes that the most optimal organizational structure is the one that can reduce transaction costs the most (Ó. Williamson 1981; O. E. Williamson 1979). One way to achieve such a structure is by mitigating the risks and uncertainties of inherent transactions. To manage this, Ó. Williamson (1981) suggested that firms should have hierarchical

structures and work with long-term contracts. The TCE theory was further developed by Ketokivi and Mahoney(2020) by applying it to different fields such as strategic management and supply chain management proving its necessity in optimizing internal and external transaction costs to enhance overall efficiency and performance.

2.1.4. Open innovation

Open innovation is the practice of in- and out-sourcing ideas and technologies accelerating innovation processes and helping firms achieve competitive advantage (Chesbrough 2003). It encourages collaboration with external parties such as customers, suppliers, competitors, governments and research institutes. This allows firms to access a broad range of resources (both financial and intellectual). This will enable firms to reach more effective and dynamic innovation ecosystems (Gassmann & Enkel 2004). Open innovation has been widely adopted in today's quickly changing technological landscape. Tani et al. (2018) argues that the new strategies of competition are mostly based on the exploitation of relationships rather than having heterogeneity of resources.

2.2. Review of existing Studies

Ching and Caetano (2021) highlight the connection between the search for radical innovation, collaboration and ecosystem participation by comparing different industry sectors. Based on these criteria, Ching and Caetano (2021) claim that start-ups are no longer seen as a threat but rather as a partner which caused an exponential growth in their engagement with incumbent firms.

Steiber and Alänge (2020) start their work by arguing that most start-up collaborations fail due to the absence of ''start-up-friendly'' procedures and the lack of ''creative thinking'' in incumbent firms. Among successful collaborations, they identified four main categories of external collaboration models based on the stream of innovation, equity involvement, resources available and degree of separation from the main business (Outside-In and Equity based: Corporate Venture and Corporate Acquisition, Inside-Out and Equity based: Corporate Incubator and Internal Accelerator, Outside-In and Non-Equity based: Co-creation and Co-location, Inside-Out and Non-Equity based: Platforms and Startup Programs). Karagiannaki et al. (2018) further developed the theory of partnership paradigm where entrepreneurial ventures and incumbents mutually benefit by the means of inbound open-innovation allowing them to leverage each other's unique

capabilities. This notion of mutual benefit is the source of any collaboration strategy.

As the trend of start-up and incumbent firm collaborations emerged, the reliance on different forms of external collaborations has increased. Many studies like the one conducted by Dix and Gandelman (2007) aim to study why large corporations undertake their R&D by start-ups under uncertainties and risks. Fulghieri and Sevilir (2009) show in their study that with the increasing competition in the incumbent's respective industry, their investments for research switch from internal to external and they collaborate with specialized start-ups to acquire external innovations. Dix and Gandelman (2007) argues that large corporation's benefit from the outcomes of the project and the compensation of the start-up mostly depends on the result of the project. At the same time, this collaboration allows startups to acquire the necessary resources for their innovations. The study by Espinosa and Suanes (2011) showed that operations like joint ventures could provide a quick solution to the resource needs of the entrepreneurial firm. They conducted a quantitative study from a large joint-venture sample and found that 61.2% of start-ups need joint ventures to grow in size and 80.6% need JVs to enter new markets (on a national and international level). Most joint ventures however are not fully equalitarian as control is mostly seen as attached to equity. This leaves start-ups with little to no control due to their financial capacity in comparison to the incumbent firm. This can be understandable as incumbents take risks and invest large capital, they would prefer to keep control as they are familiar with the market. This can hinder the relationships between both parties and have an impact on productivity. Hutter et al. (2020) studied the common challenges encountered by corporate accelerators and their findings emphasize on the importance of clear objectives, organizational support, tailored programs, flexible structure, effective monitoring and continuous learning. They suggest these guidelines to improve performance and manage collaborations more efficiently.

Kathuria and Tewari (2008), found in their study that younger firms or start-ups frequently operate using immature and unrefined routines due to their lack of experience which results in the confrontation of additional obstacles. This is further pronounced in the findings of Gimenez-Fernandez and Beukel (2017) which points to startups' heavy reliance on external collaborators due to their limited resources. On the other hand, they argued that their flexibility helps by boosting their innovation.

While startups can benefit from external collaborations and flexible innovation, the challenges

posed by their immature routines, lack of resources and limited experience often translate into practical difficulties when establishing collaborations. A good example of a start-up and large firm joint venture that did not work out would be the venture with T-Mobile and the video streaming start-up Quibi. In 2020 they decided to launch a joint venture based on promotions offered by both sides. Unfortunately, due to the pandemic and the difficulty of gaining traction in a competitive market like communication, the partnership failed (Roettgers 2020). This can be taken as an example of why both sides of the joint venture need to be ready and in line to gain success. On the other hand, an example of a successful joint venture would be the joint venture of Apple, IBM and various startups that took part in the technology development (not disclosed). Under the name Watson Health, all parties collaborated homogeneously in 2014 and improved the quality of patient care and data analytics in the healthcare industry. The startups that were not disclosed were chosen by large corporations to help them bring and build innovative ideas. They took part in the success of this joint venture as they were with two tech giants with solid reputations and a good business model ("IBM Watson" n.d.). Based on this example, one can suggest that start-ups in a joint venture should be the ones adapting themselves to fit in the plans of the bigger firms. However, some academics do not agree with this and state that both parties should divide control and match their business models. In 2013, Cestone developed a theory for joint venture control and cash-flow rights which challenges the idea of dominant control of incumbents. Their model suggests that joint venture agreements must align with contractual terms that list an equal ground between the two parties. Although the literature findings may seem like joint ventures serve a bigger strategic purpose for incumbent firms, they are also strategic tools for start-ups rather than only giving them access to resources.

The emphasis on balanced collaboration is in line with the findings of Allmendinger and Berger (2019). They explore startups' willingness to partner with incumbent firms and the factors contributing to this. Their research draws attention to the importance of openness and trustworthiness. The latter two allow both collaborators to have clarity of contractual terms. Another important factor they observed was the likelihood of startups seeking partnerships. They found that startups with high self-efficacy, or confidence in their capabilities prefer to rely on their resources. These insights suggest that effective partner selection and tailored collaboration agreements are essential for creating and maintaining successful partnerships.

Gopalaswamy (2015) studied the efficiency of partnerships to mitigate conflicts in the same

market as a case study with auto-producers. This can also be applied to that start-up setting, in a highly competitive market such as the wind turbine industry (the case study of this research), giant energy producers can present serious conflicts to start-ups that aim to disrupt the market with their innovations. Therefore, collaboration with incumbents can be a tool for start-ups to grow and enter or form a new market. In their thesis work, Gaarder and Løkås (2021) noted that the most important starting point for a start-up is to identify the part that they need to contribute and what they can offer to the incumbent. This can begin by aligning the goals of both parties which may require a reconfiguration or creation of a new business model. To facilitate such alliances, venture capital (VC) firms invest, coach and match start-ups with good partners to enhance their performances. The venture capital collaborations were further investigated by Kim et al. (2019) with an emphasis on the role of technological links and social ties. They concluded that while technological links can either promote or inhibit corporate partnerships (based on the perceived tendencies of the incumbent firm), social ties indicate the trustworthiness of the partner and facilitate the formation of ventures. They also argued that if the incumbent behaves opportunistically, the technological link would deter the new ventures and harm the partnership.

Baum et al. (2003) analyze the process of matching and building partnerships with the help of such capital firms. In their paper, Baum et al. (2003) found that those firms act as “scouts” and “coaches” for startups through the injection of management skills. They push start-ups to increase their short-term risks to increase their attractiveness. Similarly, Kurpjuweit (2019) explored the management effectiveness of asymmetric relationships with new venture suppliers. The results helped the construction of a framework that emphasizes the selection and evaluation of startup partners. He drew attention to the importance of the development of dynamic partnership capabilities to leverage complementary assets from new venture suppliers. This led to the introduction of the ‘’Startup Supplier Programs’’, which is a concept to standardize the collaboration process and ensure structured partnerships to fit the unique needs of startups (Baum et al. 2003).

While extensive literature regarding startups and incumbents exists, most of them focus on the incumbent’s perspective. Despite the meaningful understanding of external collaboration models and factors contributing to the partnership’s success, the lack of studies addressing the perspective of startups is noticeable. This gap can be observed in studies like the one conducted by Allmendinger and Berger (2019) that emphasize the importance of factors like openness and contractual clarity for startup engagement. Moreover, while the concept proposed by Kurpjuweit

(2019) emphasizes the need for dynamic partnership capabilities, much of the existing research does not fully capture the challenges faced by startups in navigating these partnerships yet. Thus, this research aims to explore strategies for startups to initiate, select, and structure collaborative partnerships effectively to ensure equitable and productive partnerships.

2.3. Types of collaboration

Startups need to choose the type of collaboration they wish to follow, Kohler (2016) describes the five main options that startups have. These five types of collaborations are support for pilot projects, distribution and licensing partnership, acquisition, attracting investors and securing an engaged customer. Based on Kohler's (2016) findings, a summary table 2.1 with each collaboration type and its description was built.

Table 2.1: Different Types of Collaborations Identified by Kohler (2016)

Collaboration Type	**Description**
Pilot project support	Assistance and funding of the startup's initial pilot project.
Distribution and licensing partnership	Distribution and use via the channels and networks of the partner (i.e., licensing deals).
Acquisition	Exit strategy for the owner, purchase of the startup in full.
Attracting investors	Corporate provides capital.
Securing an engaged customer	Corporation becomes a customer.

Additionally to the collaboration methods identified by Kohler (2016) , joint ventures (JV) are also a popular option. JV is the creation of a new commercial enterprise between two or more parties in order to retain their identities and operate under the new entity autonomously (Investopedia 2023). Numerous research has proven the benefits of JVs, among which Hagedoorn (2002), Kogut (1988), and Harrigan (1988) highlight the importance of JV's in gaining competitive advantage in both R&D and commercialization.

As observed by Pisano and Verganti (2008), it is not possible to rank different types of

collaboration methods based on their success as they each are applicable in different situations. The method chosen by the startup is dependent on their strategy, assets, capabilities, goals and the market they operate in.

2.3.1. Pros and Cons of different collaboration methods

The choice of collaboration method can have a significant impact on the success of the partnership. Startups need to consider the pros and cons of each possible collaboration method to determine the optimal choice. This section will analyse the previously mentioned collaboration methods to be able to paint a clear image of some of the startups' choices. Table 2.2 will be provided to compare each collaboration method.

Table 2.2: Pros and Cons of Different Collaboration Methods

Collaboration Method	Pros	Cons
Pilot Project Support	- Early stage funding that allows testing and validation of innovations (J. Freeman & Engel 2007) - Reduction of financial stress and risk of the startup (J. Freeman & Engel 2007) - Opportunity for the startup to demonstrate their potential (J. Freeman & Engel 2007)	- Lack of long-term commitment (Gulati 1998) - Potentially create a dependency on the incumbent (Gulati 1998) - Support with limited duration and scope (Gulati 1998)
Distribution and Licensing Partnership	- Accessing established distribution and customer networks (Tipurić & Markulin 2002) - Reduction of the workload on developing their distribution channels (Tipurić & Markulin 2002) - Faster market entry and expansion (S. Freeman et al. 2006)	- Can lose control over product-customer interactions (Tipurić & Markulin 2002) - Dependent on the incumbent's performance (Tipurić & Markulin 2002)
Acquisition	- Fast scaling and market penetration (Malieva & Trifonova) - Quick returns for startup's founders and investors - Access to incumbent's resources (Graebner 2009)	- Loss of independence and freedom (Mirvis 1985) - Risk of negligence by incumbent (Cunningham et al. 2021) - Potential integration challenges (i.e. cultural clashes) (Graebner 2009)
Attracting Investors	- Access to funding without losing full control (Sherifaj 2020) - Potential mentorship from investors (Okanović et al. 2016) - Increased credibility and attractiveness to other investors (Schwarzkopf 2003)	- Ownership dilution (Peng & Jiang 2010) - Increased pressure to deliver quick ROI's (Roundy et al. 2017) - Possible disagreements between investor and startup (Puroila 2018)
Securing an Engaged Customer	- Rapid revenue and market validation (Pansari & Kumar 2017) - Opportunity to refine product by acquiring customer feedback (Chang & Taylor 2015)	- Development priorities might be driven by customer's demands (Prahalad, Ramaswamy, et al. 2000)
Joint Ventures (JV)	- Risk mitigation by resource pooling (Harrigan 1988) - Easier to tackle larger projects (Doz 1987) - Access to complementary skills and resources (Harrigan 1988)	- Possibility of having a conflict of interest and issues related to control (Harrigan 1988) - Time-costly management (Groot & Merchant 2000) - Complex management structure (Datta 1988)

2.4. Conceptual Framework

The conceptual framework behind this research aims to provide a structured design for the analysis. It does so by integrating insights from the literature review and the theories explained, which identify the key factors that influence the success of partnerships. This will guide the analysis of Delft Offshore Turbines. The aforementioned theories approach partnership formation between firms from various angles:

· Technology commercialization theory emphasizes the importance of understanding the market needs in forming strategic alliances. It outlines the commercialization steps covering IP management and securing funding (Teece 1986; Wakeman 2008).

· The resource-based view focuses on the importance of accessing complementary resources and capabilities of partners. It underscores the mutual benefit of between the gain of necessary resources for startups and the leverage of innovative capabilities for incumbents (Barney 2001; J. Barney 1991; Wernerfelt 1984).

· Transaction Cost Economics analyses the techniques to manage economic transactions cost-efficiently (Ketokivi & Mahoney 2020; Ó. Williamson 1981; O. E. Williamson 1979).

· Open Innovation advocates for the benefits of external ideas, highlighting the significance of both in- and out-bound innovations (Chesbrough 2003; Gassmann & Enkel 2004; Tani et al. 2018).

Although each of these theories has unique approaches to partnership formation, key factors such as productivity assessment, suitability for collaboration, learning from experience, risk assessment, communication and alignment, and exit strategies are commonly shared. These shared key factors will be the prime focus of the data analysis and are explained in more detail in the following paragraph.

The first topic, productivity assessment helps identify the effectiveness of the efforts made by the startup to better understand their obstacle navigation and decision-making processes. Following, suitability for collaboration highlights the factors that yield a successful collaboration. By understanding the criteria for partner selection, a recommendation for future collaboration strategies can be formed. The third factor, learning from experience grants valuable insights into lessons learned, anticipated benefits, unexpected challenges and regrets following their previous actions. This aids in identifying various possible scenarios for the different paths, companies can take during commercialization efforts. The next topic, startup dynamics, examines the startup's ability to commercialize their product. By understanding whether the startup is adequately equipped and how its dynamics contributed to the challenges faced sheds light on the key factors in organizational development. Subsequently, risk assessment-related questions underline the way the startups address various risks and their risk tolerance for the purpose of minimizing potential pitfalls in future collaborations. Next, communication and alignment

are key concepts to identify potential communication breakdowns that can perturb the dynamics of collaborations. Understanding the communication flow during conflicts gives insight into the necessary actions for fostering effective communication in collaborations. Exit strategies is the last factor that accentuates the contingency plans used in case of an unsuccessful venture or disagreement between stakeholders. By understanding the factors contributing to the decisions related to discontinuation, risk mitigation related to partnerships can be better understood.

The topics highlighted above have been researched solely from the perspective of the incumbents, therefore little is known about the startup viewpoint. This raises a gap in the literature that is essential to research for a deeper comprehension of these topics and to practically guide startups on the best strategies available. Owing to the lack of supportive evidence regarding partnership formation strategies from the startup perspective, this conceptual framework will be applied to analyze the case study of Delft Offshore Turbines (DOT) and eight startups.

The case study with DOT will focus on the specific partnership possibilities to better commercialize their innovative slip-joint technology. The previously stated commercialization methods will be individually analyzed for this specific case study to recognize the best ways to approach commercialization for DOT's case. Moreover, the identified factors will be looked at by conducting interviews with 8 additional startups to have a broader overview on how each factor can be approached and what works best depending on the specific situation the startup finds itself. This is useful considering how unique each startup is and how much they can learn from each other's experiences. Gathering practical knowledge from different startups offers a diverse toolkit for DOT with skills that can be used depending on the circumstances. The insight of these interviews will be compared to DOT's experience to identify common themes and find applicable elements.

The conceptual framework highlights the manner under which the best strategies and practices for startups seeking to form partnerships with incumbent firms will be looked into and what elements will be given importance.

3

Methodology

This chapter will give an overview of the systematic approach used while conducting the research. It constitutes the research design, participant selection, measurements, data analysis methods and ethical considerations. This research utilizes a case study approach to analyze the partnership formation strategies during the commercialization processes of DOT. Additionally to the insights gained from DOT, eight different startups will also be interviewed. The participant selection will be randomized from the pool available in the incubator YESDELFT! The interviews will be semi-structured and focused on the previously identified factors (see section 2.4). Thematic and SWOT analysis will be conducted in parallel to this case study to identify common and unique factors.

3.1. Research Design

The choice of case study method can be justified by its ability to provide a comprehensive insight into the complex events within the real-life context. This provides evidence about causal mechanisms that is crucial for internal and external validity. This research aims to identify common factors and unique challenges faced by startups in forming effective partnerships during the commercialization of their innovations. To do so, the focus will be on a single case, DOT followed by a comparison with eight additional startups.

A case study with DOT was chosen due to their unique slip-joint technology and previous commercialization efforts which would allow this research to conduct a comprehensive exami-

nation. This method comes with the advantage of its ability to utilize multiple data sources (i.e. interviews and market research) which allows the development of a holistic view of the case.

The insights earned from DOT's experience are further improved by the comparative analysis including additional startups. The additional eight startups were chosen to provide a broader perspective for the identified factors. The selection procedure explained in section 3.2.1 ensures a diverse sample that can offer different insights from different industries. This overall improves the generalizability of the conclusions.

3.2. Data Collection Methods

3.2.1. Participants and procedure

The selection of startups was randomized with the only commonality of all being under the YesDelft! incubator. To increase the generalizability of the study, over 30 startups were contacted. The initial contact was established through LinkedIn and personal contacts, additional contacts were followed by the means of personal visits to the YESDelft! building. Despite some challenges in securing participation due to scheduling conflicts, a collaborative effort was made to maximize the diversity of experiences represented in the sample.

Out of the 30 contacted startups, the interviews were conducted with 9 startups based in the Netherlands. The participants were 89% male (8 out of 9) and 78% of them were founders or co-founders of the startups (7 out of 9). The rest two interviewees were engineers representing the companies. Among the startups, six of them were in the software industry while three were in hydrogen energy, wind energy and construction. The specifics of each startup and interviewee can be found in table 3.1.

Table 3.1: Table of Participants

Startup	Industry	Interviewee
1	Software and education	Founder and CEO
2	ICT and software	Co-founder and software engineer
3	Hardware and software (green technology)	Founder
4	Machine learning software	Co-founder
5	Hardware, software of battery systems	Engineer
6	Hydrogen energy	Engineer
7	Spectroscopy software and hardware	CEO
8	Construction and sustainable renovation	Co-founder
DOT	Wind-energy technologies, hardware	Founder

The research team aimed to have a similar structure for each interview, however still left room for follow-up questions to clarify possible doubts. Each interview started with an explanation of the purpose of the study, the rights of the participant and the expected beneficiaries of the results. Once the interview was transcribed, a summarized version of their answers was sent to the participants to acquire consent. These documents can be found in the confidential section of the appendix.

3.2.2. Measures

The study consists of two parts, the first part is based on exploring the options and potential of DOT's slip-joint technology. This was done by conducting market research from market reports and available literature. A SWOT analysis (Helms & Nixon 2010) of the slip-joint technology is performed based on the findings from the information acquired through DOT's archive and general information regarding the slip-joint technology Mojto and Cabboi (2023) and Segeren et al. (2014). Moreover, general information regarding the wind turbine industry was acquired by Van der Loos et al. (2021). This was followed by two different interviews, with DOT's founder, Jan Van der Tempel, and a representative from the consultancy firm of the startup incubator YesDelft!. The interview with Mr.Van der Tempel was to better understand their situation and their needs. The second interview with the consultant was conducted to better capture the perspective of a stakeholder who is not directly working at any startups but is still involved in their strategy

planning. Their variety of experience and a large pallet of clients helped this study to gain insights from a broader and more objective point of view.

In the second part of the study, different collaboration methods are analyzed and compared. The findings were reflected in a set of interviews with various start-ups to increase understanding of their successful collaboration structure.

The first round of interviews consisted of 11 open-ended questions targeting different aspects of the topic. The questions can be found in Appendix A. The interviews are formulated to gather information on the following topics: Productivity assessment, risk assessment, learning from experience, communication and alignment, exit strategies, start-up dynamics, and suitability for collaboration. By researching these topics, trends and patterns were identified along with limitations to derive actionable insight for future collaborations. A brief description of each topic can be found below:

The productivity assessment will help identify the effectiveness of the efforts made by the startup to better understand their obstacle navigation and decision-making processes. Two questions were used to assess this: ”How do you currently evaluate the productivity and success of your efforts to commercialize your product?” and ” Can you share any specific challenges or obstacles you’ve encountered in the commercialization process so far?”.

Suitability for collaboration highlights the factors that yield a successful collaboration. By understanding the criteria for partner selection, a recommendation for future collaboration strategies can be formed. This was studied with the following questions ”Have you considered exploring joint ventures or partnerships as a means to accelerate the commercialization of your technology?” and ”What criteria do you believe would make a potential partner a good fit for collaboration in commercializing your technology?”.

Learning from experience will grant us valuable insights into lessons learned, anticipated benefits, unexpected challenges and regrets made in their previous actions. This will help us identify some of the possible tracks for future endeavours. This was analyzed by asking the following questions: ”What lessons have you learned from your experience attempting to commercialize your IP? Are there any specific mistakes or missteps that you believe could have been avoided with hindsight?” And ”Have you considered any other partnership methods? Would you now, if you could start over?”.

Startup dynamics will examine the startup's ability to commercialize their product. By understanding whether the startup is adequately equipped and how their dynamics contributed to challenges faced will shed light on key factors in organizational development. This was asked as follows: " In hindsight, do you believe your startup was adequately equipped to navigate the challenges of commercialization?".

Risk assessment related questions will allow us to understand how these startups address various risks and their risk tolerance in order to minimize potential pitfalls in future collaborations. This was inquired by asking "How did you manage intellectual property risks and ensure the protection of your IP throughout the commercialization efforts?".

Communication and alignment are key concepts to identify potential communication breakdowns that can perturb the dynamics of collaborations. Understanding the communication flow, potential conflicts will provide insight into the necessary actions to foster effective communication in collaborations. The questions asked for this topic were: "Were there any communication breakdowns or misalignments of goals with stakeholders that impacted the commercialization process?" And " How did you handle disagreements or conflicts with potential partners or collaborators during the commercialization journey?"

Exit strategies will shed light on the contingency plans in case of an unsuccessful venture or disagreement. By understanding the factors contributing to the decisions related to discontinuation, risk mitigation related to partnerships can be better understood. To better understand these factors, the following question was used:"Did you have back-up plans or exit strategies in place in case chosen strategies were unsuccessful?".

For the second round of interview, two startups different from the first sample were interviewed on the same topics. This round of interviews used ten likert scale questions asking the interviewee to rank their agreement on a scale from one to five on statements derived from the first round's results.

For the productivity assessment, the interviewees were asked to rank their agreements for the importance of customer feedback and the balance between development and sales with the following questions: "On a scale of 1 to 5, how important is customer feedback in evaluating the productivity of your commercialization efforts?" and "Rate your agreement with the statement: 'A balanced focus between product development and sales is crucial for commercial success.' (1

= Strongly Disagree, 5 = Strongly Agree)".

The suitability for collaboration was studied under the sub-topics of partnership acceleration and trust and timing in partnerships. The questions used for this topic were: "On a scale from 1 to 5, how essential do you consider partnerships in accelerating the commercialization of your technology?" and "How strongly do you agree that trust and right timing are critical factors in forming successful partnerships? (1 = Not at All, 5 = Extremely)".

The sub-topics for Learning from experience are customer engagement and feedback, and simplicity in development processes. These were enquired by asking the following questions: "Please rate the importance of early customer engagement and adapting based on feedback in your commercialization process. (1 = Not Important, 5 = Very Important)" and "How much do you agree with the following statement: 'Keeping the development process simple has significantly contributed to our early success.' (1 = Strongly Disagree, 5 = Strongly Agree)".

Startup dynamics and risk management topics were assessed with a single question each. For Startup dynamics ther interviewee was asked "Rate how well-equipped you believe your startup was to handle the challenges of commercialization. (1 = Poorly Equipped, 5 = Very Well Equipped)" and for risk management the question used was "How strongly do you agree with the use of trade secrets and NDAs over patents for protecting IP? (1 = Strongly Disagree, 5 = Strongly Agree)".

For the topic Communication and alignment, the following questions were asked: "On a scale from 1 to 5, how much have communication breakdowns impacted your efforts?"and "Rate your agreement with the statement: 'Effective conflict resolution strategies are essential for smooth commercialization processes.' (1 = Strongly Disagree, 5 = Strongly Agree)".

Although the topic of exit strategies was included in the study initially, due to the lack of responses in interview round 1, the second round of interviews did not include this topic.

These two rounds of interview were followed by individual interviews with DOT's founder Jan Van der Tempel and a startup consultant from YESDelft!. For the interview with Mr. Van der Tempel, the topics that shaped the interview were Market fit and target audience, Partnerships and Joint ventures, Learning and adaptability, Risk management and communication, and lastly, Strategy and support needs.

For the topic of market fit and target audience the questions that were asked were:"Who are

your primary target customers for your technology? Can you describe the key characteristics and needs of these customers?" and "What is your long-term vision for the end users of your technology? How do you envision the technology benefiting them in the future?".

The Partnerships and Joint ventures were studied by asking the following questions: "You have expressed an interest in forming a joint venture. Can you explain why a joint venture appeals to you over other forms of partnerships? What specific benefits do you anticipate from this arrangement?" and "What key factors do you consider essential for a successful partnership or joint venture? (e.g., shared vision, Trust, complementary skills, financial goals)".

The questions used for Learning and adaptability were:"What are the most critical lessons you have learned from your past attempts to commercialize your product? How have these lessons influenced your current strategy?" and "On a scale of 1 to 5, how well-prepared do you feel your startup is to handle the challenges of commercialization?".

For Risk management and communication a single question was asked. This question was the following:"How do you plan to leverage your intellectual property in the joint venture?".

Lastly, the Strategy and support needs were enquired by asking:"What type of support or resources do you believe would be most beneficial to your startup in forming a joint venture and successfully commercializing your product?" and "You mentioned this lack of balance in the relationship with one another. Does that affect in any way the trust between the two companies or the mutual agreements?". The last question in Mr.van der Tempel's interview was not originally scripted but was asked as a follow-up to their answer.

The final interview of this study was with the consultant representative. This interview included the topics of Startuo Landscape Overview, Unique challenges, Effective commercialization strategies, Partner Selection Criteria, Risk management framework, Adaptation and learning, Collaborative relationships, and Exit strategies planning.

The following questions: "Based on your experience working with startups, what common patterns or trends do you see among those that succeed or struggle with commercialization?" and "What are the unique challenges you've observed in commercializing products for startups compared to larger, more established companies?" were asked to assess the Startup landscape overview and Unique challenges topics respectively.

Effective commercialization strategies were analyzed by asking the question "Which commer-

cialization strategies have you seen as most effective for startups across different industries and technologies?". This was followed by the question "In your opinion, what are the key criteria startups should prioritize when seeking strategic partners for commercialization?" to assess Partner selection criteria.

The interview moved towards the adaptation and learning, collaborative relationships, and exit strategies and the questions used for these topics were: "Can you share examples where startups were able to successfully pivot their commercialization strategy based on early setbacks or market feedback?", "What advice do you give startups on handling disagreements or conflicts with partners or stakeholders during commercialization?", and "From your consulting perspective, how important is it for startups to have clear exit strategies, and what elements should those plans include?".

3.3. Data analysis methods

The formulation of the semi-structured interviews underwent multiple iterations to ensure the coverage of the topics previously mentioned. Unlike most qualitative research, this study did not codify the interviews but rather summarized the transcript and compared the findings by tabulating different factors.

The findings from the first round of interviews were analyzed by first identifying the main discussion topics, followed by creating a comparative table to identify commonalities and differences. If one topic was present in an interview, an "X" was added to the specific box in the table. The results of this table were used to formulate a new set of questions for the second round of interviews where the participants (two new startups) were asked to rank their agreements on the findings from round one. This not only allowed a two-step verification of the observations but also increased the generalizability of this study by involving additional startups from different industries and sizes.

These main topics helped the study to classify the collaboration and commercialization strategy of various start-ups to have a comparable basis for the case study. Every data used is primary which ensures the accuracy of interpretations, making the analysis internally valid. By engaging directly with startup executives, rich and context-specific information was acquired that would not be available through secondary sources.

First, a comparative analysis was done on a question basis. This was then utilized to identify the key concepts that appeared to formulate the second round of interviews. This was done due to the broad range of experiences and variety of different industries involved. The summary and the interpretation of these results along with the comparative table can be found in section 4.2.3.

3.4. Ethical Considerations

The individuals signed an informed consent before the start of the interview and this was re-iterated at the start of the interview. At all times during the interview, participants were given the chance to voluntarily withdraw. The semi-structured interviews were fully conducted in English and each took approximately 45 minutes. The majority of the interviews were conducted online, while Four of them were on-site at their offices.

The study adhered to the guidelines of the Human Research Ethics Committee (HREC) of TUDelft regarding minimising risks and protecting the interviewee from discomfort, physical harm, mental harm and breach of privacy ("Human Research Ethics"). All the interviews excluding DOT were kept confidential and anonymous and the data was safeguarded in an online drive provided by the University which will be deleted after the completion of this research. The only part of the interview conducted with DOT that was anonymized was when the partnered firm was mentioned. This firm was indicated as "incumbent 1".

The study was approved by the HREC Board of TUDelft on April 23rd 2024 date and was registered under the number 4253.

4

Results

4.1. Case Study on Delft Offshore Turbines (DOT)

4.1.1. Introduction to DOT

Delft Offshore Turbines (DOT) is a TU Delft spinoff start-up founded by Ampelmann CEO and GROW chairman Jan Van der Tempel in 2014. With a growing team with over 40 employees, DOT specializes in several groundbreaking wind turbine technologies. These technologies range from a hydraulic pump allowing the extraction of water to various turbine installation and decommissioning technologies. These innovations allowed them to collaborate with a variety of partners and secured a position in the GROW research institute among other industry giants such as Eneco, Heerema and Shell. These collaborations gave DOT an important position for demonstration projects and pilot tests. Among these technologies, an installation method called ‘’slip-joint’’ will be studied in this research.

4.1.2. Market analysis and problem statement in wind industry

Since the construction of the world’s first offshore wind farm in 1991 in Denmark, the offshore wind energy community has been expanding significantly (Colmenar-Santos et al. 2016). Based on the calculations of the World Energy Commission, 600 tons of CO2 emissions can be avoided per one million kWh of wind power (Saidur et al. 2011). Government initiatives such as regulatory frameworks, subsidies and incentives significantly affected the formation of this market. In 2022,

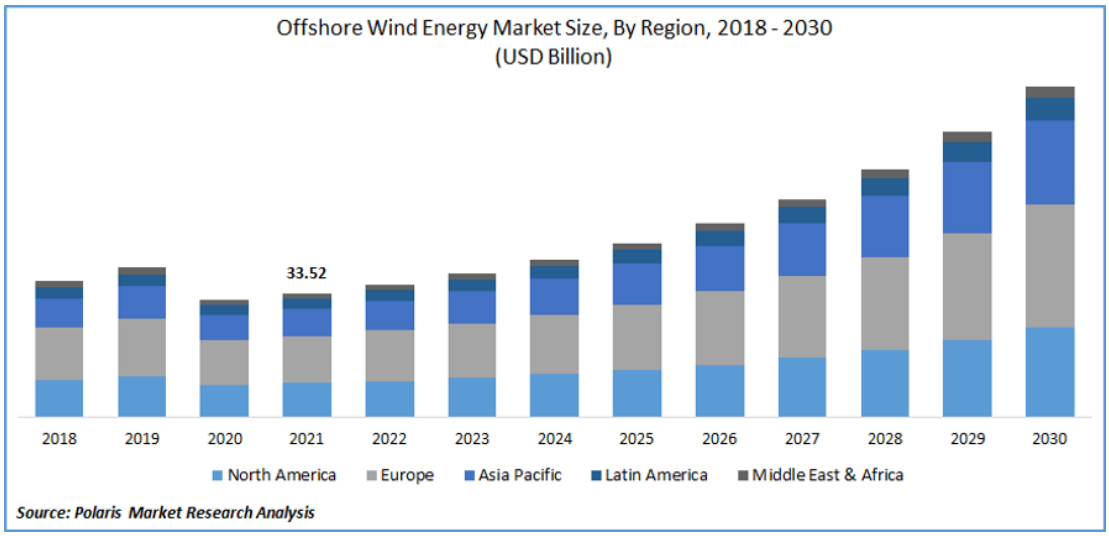
wind power generation accounted for 7.33% of the total energy generation worldwide, a little higher than the value after the Paris Agreement in 2015 (Enel Green Power (n.d.)). As a result, the capital expenditures of the top 500 energy companies have risen 8% compared to 2019 and this trend persists. Anticipated to be between 9 and 12 trillion USD by 2030, the market value rises with increasing attention to renewable energy (Energy, Power & Renewables (n.d.)). Increased investments, legislation, and scientific advancements drive novel innovations in the wind turbine industry (i.e. the introduction of floating wind turbines in 2007 (Lee 2022).

With a growing demand for wind energy, the Dutch offshore wind market is expected to grow from 4.5 GW to 21.3 GW by 2030. This expansion is expected to reach a production capacity of up to 70GW by 2050 demonstrating the growth potential of the industry. Currently, the German incumbent Siemens Gamesa leads the wind turbine installation market with the most powerful commercially available turbine SG 14-222 DD with a capacity of 14.7 MW. This dominance is not expected to last as many different firms are currently in the prototype phase of even bigger turbines such as the Chinese incumbent Mingyang's MyS- 22MW wind turbine. The intensity of this competition can be seen as the driving force for innovation and efficiency as different firms strive to differentiate themselves by investing in various innovation projects that are both unique and cost-effective. These investments allow them to gain a competitive advantage as the offshore wind turbine industry is becoming an essential contributor to the global energy transition powered by the worldwide common aim to reduce carbon emissions and move towards renewable energy sources. The capacity to implement this technology on a large scale in off- and on-shore locations with existing grid connections makes this technology and the overall sector attractive to investors and governments. Aside from its attractiveness from an investment point of view, expanding the wind turbine industry would also contribute to job creation and economic growth. With more projects being developed along with groundbreaking innovation, the need for skilled workers in various fields (such as engineering, maintenance, R&D and construction) will also grow. This will not only benefit the large-scale governments but also the local economies.

Thus far Europe has shown the highest expansion in the wind turbine industry. 14 European companies are among this sector's top 28 largest companies (Inven 2024). A similar trend can be seen in the wind energy market size growth led by Europe (figure 4.1 from Polaris Market Research). Countries like the Netherlands, Germany and the United Kingdom have played a significant role in this expansion. This resulted in the creation of an ecosystem for companies,

research institutes and regulatory bodies.

Figure 4.1: Offshore wind market size by region taken from Polaris Market Research



The increasing competition forces have pushed companies to develop innovative solutions to increase efficiency further. This has led to the emergence of advanced operation techniques (installation, transport and decommissioning), better grid integration and more hard-wearing materials. This progress reduces the cost of wind energy production and increases its scalability (Deveci et al. 2020). Although this may indicate very positive growth for the industry overall, it was observed that small companies struggle to integrate their innovations and acquire a significant market share.

The wind market is growing and becoming more competitive. This makes it more difficult for small startups to survive. According toVan der Loos et al. (2021), the resilience of a company in the offshore renewable sector can be studied based on the level of innovation. Startups are shown as the key actors in a disruptive innovation with low adaptability. To help this, several government grants from the Netherlands were mentioned as it was found that receiving support from the private sector is incredibly difficult if innovation can put the private sector out of business.

DOT is one of many startups that have been benefitting from these grants to survive this competitive environment. They have collaborated with many industry giants and proved their technologies. However, Van der Loos et al. (2021), highlights that disruptive startups (like DOT for this case) are struggling to get financed because they are required to secure in-kind (non-monetary) funding from the private sector to access public funds. Moreover, they argue

that this environment necessitates constant market renewal to avoid vulnerability to disruptions. As Van der Loos et al. (2021), was focusing on the Dutch market, their analysis concluded that the current wind turbine market in the Netherlands lacks strong legitimacy beyond traditional offshore wind technologies.

Due to this difficulty, the Netherlands failed to capture innovation and the startups failed to survive this competitive market. With such high risks and dynamics in the market, Van der Loos et al. (2021), concluded that an internal capture for these disruptive technologies would be the right strategy. With the implementation of new regulations caused by the steady increase in demand for wind energy, wind turbine producers started to increase the turbine dimensions (larger rotor diameter) resulting in heavier nacelles. This was due to both the limited available space in wind turbines and an observed decline in costs. The levelized cost of energy has been observed to decline by 20% between the years 2010 and 2018 according to Jiang (2021).

Bigger nacelles naturally require stronger equipment or more vessels during installation compared to traditional wind turbines. The shortage of offshore installation vessels makes the installation of these heavier turbines more difficult (from the article Plechinger 2023). An entire wind turbine installation may need more than a single vessel such as a foundation Installation Vessel (FIV) and a Wind Turbine Installation Vessel (WTIV). Based on the report from WindEurope (2022) in collaboration with the Polish Wind Energy Association in June 2022, a shortage in FIV and WTIV was observed and expected to worsen over time. The article mentions the biggest demand for these vessels to be expected between the years of 2028 and 2030 where the wind turbines are expected to grow to capacities up to 20MW.

As mentioned in the paper from Jiang (2021), the cost of wind turbine installation vessels can range from $ 1000 per day to $500.000 per day depending on the weight of the turbine. As specified in the same research, each vessel has a certain weight capacity and the options are decreasing with the weight increasing. Moreover, the selection of vessels is noted to be based on market availability, the budget of the project and the number of components (and their respective size) which are steadily increasing with the production of larger turbines (Jiang 2021).

To overcome this cost-related issue, startups like DOT are crucial stakeholders as they develop innovations like the slip-joint technology.

4.1.3. Slip-joint description

The slip-joint technology allows a cheaper, safer and faster installation by extending the crane life (by reducing wear and tears), eliminating the need to have personnel on the main platform during lifting, and allowing an installation of approximately 10 minutes (compared to conventional methods that take hours or -even- days). The way this technology works can be -simply- explained as inserting two transition pieces that constitute a turbine monopile. Although WindMasters originally invented this technology, DOT holds an intellectual property for an antifouling coated slip-joint technology which further protects the monopile from corrosion and damages (see Appendix figure A.1).

In August 2019, a DOT turbine with this technology was successfully decommissioned from Eneco's Princess Amalia wind park (off the coast of Ijmuiden) by GROW with the lead of Heerema -the marine contracting firm- after a successful test year. Although this technology is very promising for the wind turbine industry, only 1 slip-joint turbine was commercialized by DOT thus far (Borssele V as displayed in figure 4.2, from articles "“DOT Monopile Installed at Princess Amalia OWF”2018" and "“World's First Full-Sized Submerged Slip Joint Successfully Installed" 2020"). While DOT possesses this invaluable intellectual property, an incumbent firm -serving as the installation contractor- possesses the essential ‘’cookbook’’ recipe detailing the specific methodologies of the turbine monopile installation. For the sake of confidentiality, this firm will be called Incumbent 1. The overwhelming market share owned by incumbent 1 raised a misconception among other companies that this slip-joint technology could only work with incumbent 1's specific vessels. This led to a significant hesitation in the acquisition of the IP. A more detailed description can be found in the interview summary with Mr. Van der Tempel.

With such increasing operating costs along with decreasing supply (relative to demand), time and resources, technologies such as the slip-joint technology have the potential to be the driving force of transformational pathways in the wind turbine installation processes. One of the main value propositions of the slip-joint technology is that it allows the installation to be performed with a large variety of installation vessels due to its simplicity and lightweight design.

That is the identified problem that drove DOT to patent the coated slip-joint technology as it only requires one vessel and allows a quick and safe installation process. This was done in collaboration with incumbent 1. This technology can potentially attract many incumbent firms

Figure 4.2: DOT turbine sith slip-joint technology in Borssele V

and catalyze the creation of a new market standard with its resource, cost, and time efficiency.

4.1.4. SWOT analysis

Based on the findings in the literature, DOT's archives and the previous market description, a SWOT analysis (Helms & Nixon 2010) is warranted to put the slip-joint technology in perspective. The key strengths of this technology are the reduced usage of steel, faster installation and increased efficiency and safety. With its simple design, the slip-joint technology does not require as many resources as the traditional monopile installation method. Overall, the key value propositions of the slip-joint technology are highlighted in the strengths column, whereas the weaknesses and threats describe the observed lack of ''innovation and startup-friendly environment'' within the wind energy market both in Europe and Worldwide. Moreover, during the interview with DOT's founder, Mr. Van der Tempel, an unusual weakness of simplicity was mentioned in section 4.1.5 along with invisibility. According to Mr Van der Tempel, the simplicity of the slip-joint solution raised scepticism within the market. Moreover given its design, the end users can not understand the technology entrapped in the monopile. Although this technology has great potential for market differentiation, expansion and collaboration, it also has the risk of falling behind due to the competitive pressure.

Below, a SWOT analysis for the slip-joint technology can be found: enumitem

Table 4.1: SWOT Analysis of the Slip-Joint Technology

Aspect	Strengths	Weaknesses	Opportunities	Threats
Details	• Reduction of steel required • Lower material costs • Reduction of secondary steel and external hooking points • Faster and more efficient installation • Minimized risk related to installation • A great variety of installation vessels can be used	• Traditional installation method is an ingrained standard • Scepticism due to simplicity and invisibility • Difficult market for innovation	• Unique competitive advantage (faster and cheaper project delivery) that can attract new partnerships • Market expected to grow significantly with new environmental policies • Environmental friendliness can enhance the public perception of the company	• R&D and development to maintain market relevance which can result in falling behind and losing the competitive edge gained from early innovation

The aspects mentioned in table 4.1 will be further analyzed in chapter 4.

4.1.5. Problem statement for DOT: Insights of the Interview with DOT:

During the interview, the three target customers were identified as wind farm developers (primary), installation contractors (secondary), and engineering firms that conduct the product design (tertiary). Moreover, DOT hopes to make the -mature and proven- slip-joint technology, an industry standard for connecting the monopile foundation and tower. The value proposition of DOT lies in the sales of the IP as the primary product followed by various services to become a service and maintenance provider company for the end users.

Due to their current partnerships, however, their ambitious goal is hindered. The slip-joint technology was developed together with an installation contractor firm. This firm will be named ‘’Incumbent 1’’ in this study due to confidentiality. Incumbent 1 has access to all of DOT’s information, while DOT does not have access to Incumbent 1’s knowledge. Due to this imbalance in information sharing, the slip-joint technology became a strategic tool for incumbent 1. This caused mistrust between both companies. Mr. Van der Tempel emphasized further that DOT has ‘’the most to lose’’ compared to incumbent 1 which would benefit their projects by locking the technology. Due to the size of Incumbent 1, potential customers developed the wrong perception that the slip-joint comes with the vessels of Incumbent 1. This locks up the technology, by

building a joint venture, DOT hopes to go around this perception while still utilizing the market intelligence of their partners.

With this new joint venture, the coated slip-joint technology is hoped to be seen as neither the incumbent 1's nor DOT's technology, but rather a separate technology attempted to be pushed into the market by the JV. Mr. Van der Tempel highlighted the main goal of the joint venture is to achieve autonomy. Among various criteria for partnership selection that were mentioned to be important (shared vision, trust, complementary skills and financial goals), autonomy was highlighted the most. This was justified by Mr. Van der Tempel as the main lesson he learnt was the significant resistance against something new. He highlighted the two main weaknesses of the slip-joint technology: simplicity and invisibility of the solution. He argued that these two traits make people very uncomfortable. As simple solutions are harder to gain the trust of the end users and such products that cannot be seen from an outsider's look as the key element of this technology is located inside the monopile.

These experiences allowed Mr. Van der Tempel to understand that this kind of innovation project in the wind turbine industry needs to be understood before the final design stage. An early-stage embrace would require getting the engineers on board and convincing banks to get financing. He also highlighted that this is very important as such technologies are not built to be used short term, but rather for 30 to 50 years as a structural element.

Regarding the readiness of their startup, Mr. Van der Tempel believes that they are prepared to undergo such partnerships and commercialize their IP. The only necessary resource for the formation of a joint venture mentioned by Mr. Van der Tempel is a team of 3, one team lead who will be in contact with customers and 2 engineers.

4.2. Comparative Analysis with Other Startups

4.2.1. introduction

The second part of this study is constituted of interviews with eight different startups additional to DOT and a consultancy interview. These interviews provide rich qualitative data that will complement the findings from the first part's case study. Each interview was transcribed and analyzed to identify key themes and insights. The results of these analyses will be displayed below and the transcripts can be found in the confidential part of the appendix.

4.2.2. Interview with startup consultant

An interview with the representative of a consultancy office in a startup incubator was conducted. During the interview, funding from venture capitalists or other external sources was highlighted as a crucial accelerator of growth, not only financially, but also as an increase in network and guidance. The interviewee specifically mentioned that -unlike large firms- unique challenges such as long development timelines and resource limitations may arise for startups. Hence, this can hinder the attraction and retention of customers during various stages.

To navigate these challenges, the interviewee added that effective commercialization strategies are essential and need to be tailored to the product or service provided by the startup in question. He further gave the example of collaboration strategies being beneficial depending on the situation. While partnerships like joint ventures can provide significant benefits to the end customer, they can sometimes switch the focus away from the customer and lose a broad section of potential end-users. Moreover, emphasis was put on the importance of prioritizing key criteria pre-determined by the startup in the partner selection process. He argued that the chosen partners should offer unique benefits that other candidates cannot provide to ensure a competitive advantage.

Another vital factor mentioned during the interview was concerning managing risks, particularly related to IP. The interviewee gave an anecdote from a previous customer who did not efficiently consider the geographical scope of their IP protection and required advice. A solution that was mentioned was the inclusion of advisors or other various team members to explore the IP-related challenges. Another solution that was mentioned was free workshops available for smaller startups to help them during the early stages.

Moreover, adapting and learning from market feedback was highlighted as an indispensable step to success. The interviewee mentioned that all successful startups pivot their target audience and market rather than their products. As a consultant, the interviewee also mentioned that they help startups expand their market reach and help them improve their relation with their end users. They can achieve this through their extensive network solidified by working with various companies over the years. In relationships that involve partnerships, collaboration or solely consultancy, open communication and honesty are crucial, especially in the early stages. This was further justified by another anecdote where their customers -who were the co-founders of a startup- did not have a shared vision -which was also mentioned as a key factor- and had

disagreements which led to an eventual split of the company. An important lesson learnt by the interviewee was that a coach could be a suitable fit for this specific situation.

The interview was concluded with a small discussion on the importance of having a clear exit strategy stemming from their previous successes and failures. The interviewee argued that each startup needs an exit strategy to be prepared for different scenarios.

4.2.3. Question Results

Question 1

Table 4.2: Question 1 comparative table

Evaluation Strategy	Startup 1	Startup 2	Startup 3	Startup 4	Startup 5	Startup 6
Data-driven decision making	X	X			X	
Customer Feedback&Engagement	X	X			X	
Market demand and fit	X	X			X	
Regulatory environment			X			X
Industry Potential awareness				X	X	
Product Development and sales balance					X	X

Each startup's approach to analysing its productivity reflects its unique market position, industry demands, and internal capabilities. To understand better the commonalities and differences, a summary of each startup's answer along with a comparative table was built. Startup 1 focuses on improving its data-driven evaluation process by acknowledging gaps in ROI. They emphasize the importance of product satisfaction and user feedback metrics like Annual recurring revenue (ARR). The focus on the consumer and their feedback was also reflected by Startup 2 as they used metrics such as user retention and virality range to evaluate the product-market fit. This allows them to ensure the alignment of their strategy with user engagement.

The trend of data and feedback usage is not followed by all startups. Startup 3 is driven by its mission to address environmental issues and it bases its productivity on its impact on current plastic removal rather than business metrics, this strategy causes it to struggle with market demand and regulatory barriers. Regardless of the method used to analyze productivity, startup 5 emphasized

the importance of continuously developing the product to strive while balancing productivity in engineering and commercial efforts.

Startups 4 and 6 did not specify any detailed process for their productivity assessment however they argued that they see potential future growth and that they adopt a patient approach.

Question 2

Table 4.3: Question 2 Comparative Table

Challenges	Startup 1	Startup 2	Startup 3	Startup 4	Startup 5	Startup 6
Understanding Buyer/User Personas	X			X		
Building Trust		X			X	
Regulatory and Responsibility Issues			X			X
Technology Complexity		X		X	X	
Market Adoption		X		X	X	X
Compatibility Issues					X	
Pricing/Cost Challenges					X	
Application Scope				X		
Finding Market Fit				X	X	

The challenges faced in the commercialization processes yielded a great variety, the results of this question are tabulated in table 4.3. Understanding the user persona and addressing them was a common challenge mentioned by startups 1 and 4. Within the university ecosystem, startup 1 pointed out that the main issue was raised due to the disconnect between the end user and the budget-holding personas. A similar disconnect was also mentioned by Startup 4 caused by the product's complexity. By adopting a simpler and industry-friendly product, they balanced this issue. They pointed out that market education is key to being able to achieve a wider application range for their product.

The notion of market education is also mentioned by Startups 2,5 and 6. Startup 2 talked about the challenges they faced in convincing potential users as their product is like a ''black box'' for the end user. Their target is to build trust within the market and prove their product's added value.

Gaining the trust of the market is also a challenge mentioned by startups 5 and 6 as they struggle with market adoption and standardization due to the novelty of their product.

Startups 3 and 6 face challenges related to regulatory and responsibility issues; Their challenges, however, are significantly different. While Startup 3 emphasize the need for stricter regulations to enforce accountability in environmental management, Startup 6 claims that the regulatory steps that are mandatory slow down the production and commercialization process.

Question 3

Table 4.4: Question 3 Comparative Table

Aspect	Startup 1	Startup 2	Startup 3	Startup 4	Startup 5	Startup 6
Current Partnerships	X	X	X		X	X
Seeking Further Collaboration	X	X	X		X	X
Primary Challenge	Market validation and trust	Building trust	Finding the right tech-partners	Balancing independence	Aligning market and partnerships with their vision	Risk of idea theft by more mature partners
Core Strategy	Crossing chasm for reseller adoption	Partnership formation	Partnerships based on core values and mission	Independent growth and acquisition	Diverse strategies to expand market reach	Collaborative innovation and learning from mature partners

In this question, the suitability of startups for collaboration is analyzed (see table 4.4). Each startup had a different kind of strategy when it came to collaboration. Startup 1 recently engaged in a reseller partnership however they previously avoided this model due to the lack of market recognition and interest from resellers in explaining the product. Startup 2 decided to follow an affiliate partnership seeking mutual benefits. Their product functions as a plug-in to another company's software. Active collaboration with various partners was the chosen strategy of Startup 3 as they see collaboration as a core value to achieve their goals. Similarly, startup 5 partnered with various software and hardware companies while keeping their distance to committing to only one partner. They believe partnerships are vital for network and resource expansion which positively affects their market appeal. Another alternative strategy that benefits from the network and

resources of their partners is the one followed by Startup 6, they decided to leverage incubators and subsidies in their prototype phase to foster collaborative innovations with other startups working in similar fields. Their work demonstrated the importance of collaborative networks for securing funding and accelerating the development of the technology. They emphasized the strategic benefit of learning from the collaboration regardless of the risk of getting copied by competitors.

Startup 4 initially bootstrapped and retained independence however due to the nature of their product being a component of the final solution, they decided to sell the company after gaining market insight.

Question 4

Table 4.5: Question 4 comparative table

Criteria	**Startup 1**	**Startup 2**	**Startup 3**	**Startup 4**	**Startup 5**	**Startup 6**
Exact market match	X					
Market/audience expansion		X				
Trustworthiness		X				
Ethical/sustainable goals			X		X	X
Strategic alignment				X	X	
Complementary capabilities				X	X	X
Sales performance					X	
Shared vision/goals			X		X	X
Integration capability				X	X	

The partner selection criteria mentioned by Startup 1 were based on the end users as they aimed to find partners with identical or very similar buyers or markets. They highlighted in their answer the difficulty of finding a good match.

Startup 2 indicated that they aim to find partners that can enhance their marketing efforts along with expanding their reach to prove their concept and gain the trust and engagement of the

target audience.

From a different perspective, startup 3 values partners that share similar motivations for addressing environmental issues. Similarly, a match in vision is also a desired criterion for startup 6 possessing complementary knowledge along the way.

Startups 4 and 5 seek strategic alliances to integrate their technology to increase the overall sales performance of the final product. As they both produce intermediate products, they rely on their partners to be able to offer a complete final solution to the user. Startup 5 specifically stresses the importance of mutual contributions and integration capabilities.

Question 5

Table 4.6: Question 5 Comparative Table

Strategy/Approach	Startup 1	Startup 2	Startup 3	Startup 4	Startup 5	Startup 6
Early customer engagement	X	X			X	
Sell concept before product	X					
Clear communication agreements			X			
Adapt based on customer feedback	X	X			X	
Formalize agreement early					X	
Keep development simple		X				
Prioritize customer needs		X			X	
Learn from market feedback	X	X			X	
Appreciate startup agility				X		
Continuous product adaptation	X	X			X	
Importance of preparation phase						X
Balance speed with thoroughness						X
Manage investor pressure						X

Among various lessons learnt, seeking customer feedback appears to be the most commonly given answer in table 4.6. After selling the company to a bigger firm, the interviewee from Startup 4 reflected on the agility and flexibility of the startup environment and appreciated the fast adaptability of new startups.

Startup 1 emphasizes the importance of selling the product or concept as early as possible in order to get market feedback or validation. They claim it is a key step to also get initial funding. A similar lesson was also mentioned by Startup 5 where they highlighted the potential changes

due to differences between expectations and market reality. They also added that nothing should be deemed concluded until it is fully finalized.

Unlike Startups 1, 5, and 6 highlighted the critical importance of a good preparation phase in product development suggesting a balanced approach between technical and economics to thoughtfully plan and avoid future problems with clear communication. Similarly, startup 3 stressed the importance of clear communication being key for both formal and informal relations between various stakeholders. They suggested this as a solution to avoid misunderstandings and disputes in the early stages.

The main lesson learnt by Startup 2 was the importance of simplicity, this was also mentioned in the interview of Startup 4. They learnt that more understandable products are more market-appropriate then complex products and they highlight the feedback received by the customer allowing them to identify better with the product.

Question 6

Table 4.7: Question 6 comparative table

Features	**Startup 1**	**Startup 2**	**Startup 3**	**Startup 4**	**Startup 5**	**Startup 6**
Focuses on independence	X	X				X
Viewing relationships as suppliers		X				X
Open to partnerships			X	X	X	
Using licensing or leasing			X		X	
Emphasis on IP and patent			X			
Undergoing investment search			X			
Trial collaboration before formalization				X		
Experiencing rapid changes in needs					X	
Restrained by financial limitations	X					

Each Startup had a different strategy when it came to partnerships. Startups 1,2 and 6 emphasize maintaining a certain level of independence. They Adopted a cautious approach to partnerships and focused on in-house development instead of outsourcing or collaborating. This preference is linked to the desire to control the core technology and the strategic trajectory of the startup.

Startup 1 added the restrains faced by financial limitations preventing them to acquire other firms and expand.

While some startups are cautious about maintaining their independence, some are cautious about the strategy they choose to follow. For example, startup 4 stresses the importance of testing the compatibility of partners before formally forming a partnership.

Another alternative approach was observed to be followed by startups 3 and 5 which aim to actively explore new partnerships to expand their network. They both look into licensing and distribution-oriented partnerships to increase their market share.

Question 7

Table 4.8: Question 7 Comparative Table

Aspects	**Startup 1**	**Startup 2**	**Startup 3**	**Startup 4**	**Startup 5**	**Startup 6**
Level of Preparedness	Moderate	High	Moderate	Low	Moderate	Moderate
Key Strengths	SaaS resources	Lean methodology	Diversity and development	Communication	Flexibility	Strong business connection and model
Key Weaknesses	Industry knowledge	Practical application	Sales and finance	Business and sales	Staffing and resources	Technical expertise
Learning Methodology	Online resources	Academia	Coaching	Experimental learning	Continuous improvement	Market-focused development

As seen in table 4.8, startups described different levels of preparedness from low to high. Startup 2 which appeared to have a high preparedness level had a clear advantage in adaptation and flexibility due to their educational background and focus on lean methodologies. On the lower end of the preparedness level, startup 4 faced a steep learning curve in the business and sales department and needed to invest more in overcoming the gaps in knowledge initially faced. The rest of the startups remained at a moderate level of preparedness with important key strengths and weaknesses.

Startup 1 mentioned their capabilities in Software as a service (SaaS) resources as their strength while lacking in industry knowledge hindering their market spread. While Startup 2 utilized

its knowledge of lean methodology, it observed some setbacks in the practical application of its scholarly knowledge. Startup 3 had a strong and diverse team however lacked sales and finance-related knowledge as it mainly focused on its environmental goal. An interesting case was for startup 4 where they claimed their communication as their strength however they also struggled with intel on sales and business. Startup 5 represented the ‘’typical’’ startup model where they benefited from their flexibility and adaptability while they were limited to their resources which hindered them from expanding their team. Lastly, Startup 6 Had a very interesting approach as unlike every other startup interviewed, they lacked technical knowledge while their business model and network were indicated as their strength.

Question 8

Table 4.9: Question 8 comparative table

Aspects	**Startup 1**	**Startup 2**	**Startup 3**	**Startup 4**	**Startup 5**	**Startup 6**
Not protecting	X				X	
NDAs			X	X		X
Trade secrets		X		X		
Patents						

Looking at how startups protected their IP or product (table 4.9, it can be seen that no startup used patents. The most commonly mentioned methods are trade secrets (startups 2 and 4) and NDAs with partners and within the team (startups 3,4 and 6). Startups 1 and 5 choose not to protect their IP as they welcome competitors to create traction and possibly a shift or creation of a new market.

Question 9 and 10

Table 4.10: Questions 9 and 10 comparative table

	Startup 1	**Startup 2**	**Startup 3**	**Startup 4**	**Startup 5**	**Startup 6**
Miscommunication	Yes	No	No	No	Yes	Yes
Inside team	Yes	No	No	No	Yes	No
Outside team	No	No	No	No	No	Yes

Only 3 out of the 6 startups mentioned miscommunication in table 4.10 and each employed different solutions. Startup 1 mentioned that bringing engineers to the sales part was a solution to help their engineers understand the commercial side to avoid miscommunications within the team. Startup 5 highlighted that to handle disagreements or conflicts during commercialization, it is effective to share a common goal, take breaks to reflect before making decisions, and ensure dynamic interactions within a team to prevent stagnation and facilitate progress. They also mentioned a form to share updates to avoid any misunderstanding. Lastly, startup 6 argued that they try to learn from every communication breakdown and not let miscommunications stop or slow them down. Their approach was described as ‘’ go with it and take it as it is and make the best of it’’. They explained that every delay in the project was a valuable learning opportunity used in the next projects. It is interesting to see that all three approaches were very different, Startup 1 has a more engaging approach to homogenising the understanding of the goal within the project while Startup 5 prefers to take a step back and try to see the bigger picture by using communication tools such as forms to communicate clearly. Startup 6 has a very different approach from the previous two, which involves learning from mistakes and not letting small disagreements slow them down.

4.2.4. Second round of interviews

The overall results obtained from the first set of interviews were discussed with two additional startups to have a secondary confirmation of the findings. To achieve this, a new set of interview questions on the same topics, consisting of a five-point Likert scale was used. The results of these interviews with additional comments from the startups will be illustrated below.

Table 4.11: Summary of interview round two

Aspect	**Startup 7 Rating**	**Startup 8 Rating**
Customer Feedback Importance	5/5	4/5
Balance of Development and Sales	5/5	5/5
Partnership for acceleration	4/4	5/5
Trust and Timing in partnerships	4.5/5	4/5
Customer Engagement and feedback	5/5	5/5
Simplicity in Development Processes	4/5	3/5
Adaptability and Preparedness	2/5	3/5
IP protection strategy	2/5	1/5
Impact of Communication Breakdowns	4.5/5	1/5
Handling disagreements	5/5	5/5

From Table 4.11, it can be seen that both startups highly value customer engagement and their feedback, maintaining a balance between sales and the development of the offered products or services, trust and timing of partnerships and handling disagreements. While startup 7 emphasizes that feedback is crucial in avoiding over-engineering products, startup 8 argues that feedback is useful for designing a unique selling point of a product. Similarly, they also agree on the importance of the engagement of the customer, startup 8 also specified the importance of early adaptors and their roles in demonstration projects.

Another common ground highlighted by a five out of five grade given by both startups on the importance of handling disagreements. Startup 7 specified the importance of documenting every decision and agreement as they think that verbal promises can be misinterpreted and possibly cause future problems.

Both startups agree that it is important to avoid developing unwanted or impossible products but rather have a balance between different departments such as engineering and sales departments are equally important in the development of a good product.

Interestingly -although the difference in their assessed grade is very small- while startup 7

argues that trust and timing are critical factors, startup 8 thinks that trust can be earned later on with the proper proofs and permits.

While both companies recognize the importance of collaboration and partnerships, startup 8 seems to value them marginally more. Startup 7 sees partnerships as means of accelerators as they refer to the incurring costs that startups face when they need skilled -and often expensive- personnel. Startup 8 sees partnerships as the key to leveraging existing infrastructures in a developing industry.

A similar slight difference can be seen in the importance given to the simplicity of the development processes being more valuable for startup 7. While Startup 7 argues that simplicity can yield clearer communication and therefore, fewer errors, Startup 8 draws attention to the importance of having a deep knowledge in case of technical complexity. This is an interesting contrast between these companies and DOT as they suffer from the over-simplification of their product.

A commonly observed low grade between both interviews was for the usage of NDA as an IP protection strategy instead of patents (which was a common trend observed in the first round of interviews). Startup 7 argues that a comprehensive IP protection plan is necessary including different methods such as NDAs and trade secrets. The power of patents to have more authority was emphasized by Startup 8 arguing that only an NDA is not enough to protect the IP.

On the impact of communication breakdowns, however, differing views can be observed. Despite the high importance of its impact indicated by Startup 7, as they argue that it can lead to people working on different goals, the Startup 8 interviewee mentioned that a minimal impact was observed due to personal preference against communication breakdown.

Regarding the preparedness and adaptability of the startups in question, both interviewees refrained from giving a high grade, emphasizing that due to their short time on the market, they are still in need of improvement and that they are not as prepared yet as they hoped to be.

4.2.5. Summary of the interview rounds

From the first set of interviews, it was observed that startups prioritize customer feedback and data-driven insights to assess their productivity. A frequently mentioned theme in the interviews was the importance of focusing on balancing product development with sales and navigating the

market. The latter was observed to be hindered by challenges like technological complexity and consumer scepticism.

To overcome such challenges, the employment of diverse and strategically tailored partnership models by startups was observed frequently. Those models were based on trust, shared vision, and complementary goals, while their approach to partnerships varies with some favouring licensing or leasing and others valuing independence.

Whilst following those models, startups acquire a lot of experience and learn valuable lessons among which the importance of early customer engagement, responsive adaptation, and clear communication is highlighted.

Regardless of the model chosen, a varying level of preparedness was observed. For commercialization challenges, startups leveraged their unique strengths and adaptive learning methods to enhance flexibility.

Among the startups that own an IP, a preference to safeguard their IP through trade secrets and NDAs was noted. Some of the startups opted out of patent protection to encourage competition.

Regarding miscommunications within the team, 3 startups that experienced this have noted that effective communication and conflict resolution are crucial, underpinning their strategies to manage disagreements and improve commercialization efforts.

During the second round of interviews, most of the first round's findings appeared to be in line with the experience of startups 7 and 8. The only differing points were regarding the IP protection strategy and the impact of miscommunication. Both startups disagreed with the lack of patents observed in the first batch of interviews, they both agreed that additional measures to NDAs and trade secrets are necessary and that patenting is a great addition to secure their product and achieve authority. This was also mentioned during the interview with DOT's founder Mr. Van der Tempel, patents served as the basis for DOT's JV to achieve autonomy.

Only startup 8 disagreed with the impact of miscommunication as the interviewee specified that this was due to their personal preference for working. The unique perspective of each interviewee based on their function is also an important factor that was not considered in this study.

4.2.6. The collaboration method chosen by each startup

As delineated in the literature review and the interviews in this study, no rules are specified to rank collaboration methods. Each chosen method was justified by the respective startup during the interview. A summary of each start-up collaboration method chosen and their reason is described in table 4.12. Startups 7 and 8 were not interviewed on their partnership choices but rather on their agreements on the conclusions from the first interview round.

Table 4.12: Startups collaboration choices and their explanation

Startup	Collaboration method chosen	Brief reasoning
1	Reseller agreement	To expand the reach of their technology as much as possible
2	Add-on to partner's platform	To complement and assist users
3	Project based partnerships	To achieve milestones in their sustainability goals
4	First bootstrap, then acquisition	To be a part of a complete solution for the end user
5	Actively seeking partnership	To complement their technology
6	Project based partnerships	Helps them acquire subsidy to finance projects
DOT	Joint Venture	To create a new entity to avoid skepticism due to current partnership

5

Discussions

5.1. Synthesis of findings for DOT

This section focuses on synthesizing the findings from the case study and compare them with different collaboration methods previously analyzed to evaluate the most suitable option for DOT. The insights from the market analysis, interview with Jan Van der Tempel and the conceptual framework build will be incorporated to provide a comprehensive analysis for DOT.

The interview with Mr. Van der Tempel and the Wind turbine market analysis revealed that the commercialization issues faced by DOT were industry-specific. As reported in the Van der Loos et al. (2021), the wind turbine market in the Netherlands lacks legitimacy beyond traditional offshore wind technologies. This causes a failure in capturing innovations with great potential such as the slip-joint and causing the traditional methods to be unshaken. Due to the nature of the market, it is demanding for startups to strive alone.

The SWOT analysis conducted in table 4.1 for DOT's slip-joint technology demonstrated that the technology has strong innovativeness and that it is a very beneficial solution for the growing market demand due to the lack of installation vessels. However, weaknesses mostly caused by their current partnership such as heavy reliability on incumbent 1 present significant hindrances. DOT's slip-joint technology has the opportunity to expand the wind turbine sector. However, this was not achieved yet due to the lack of startup-friendly environment consequential to the intense market competition. Due to this unique market situation, DOT will need a partner that

has significant market share like incumbent 1 to bypass these threats. The results of the SWOT analysis underscore the necessity for a strategic partnership to leverage the mentioned strengths and opportunities while mitigating the threats and weaknesses.

The literature on startup-incumbent partnerships emphasizes on its importance as it grants access to necessary resources for startups and innovative capabilities for incumbents (Karagiannaki et al. 2018). The shift of startups from threats to partners for incumbents opened a window of opportunity for companies like DOT to prove their value and collaborate with industry giants to position themselves in competitive markets like the wind industry. Ching and Caetano (2021) highlight the exponential growth opportunity for startups generated by participating in large ecosystems of incumbents.

Steiber and Alänge (2020) illustrated that one of the main reasons for failure in such partnerships is the lack of ‘’startup friendly’’ environments. This pattern was also observed in the market analysis for the wind turbine sector in the Netherlands. Moreover, in their interview, Jan van der Tempel also mentioned that innovations were not welcome in this industry and that simple solutions were approached sceptically.

This was also observed in the market analysis conducted for the wind turbine industry. In spite of the Dutch government’s initiatives to help firms compete in this growing market, the level of competitiveness is very high for small startups. Startups like DOT struggle to capture significant market share due to high costs (both resource and financial) associated with wind turbine operations. As large incumbents like Siemens Gamesa currently dominate the market, DOT needs a strategic partnership to survive and expand.

Previously analyzed theories, such as the open innovation and resource-based view theories suggest that collaborating with other firms can enhance a firm’s market reach and level of innovation (Barney 2001; J. Barney 1991; Chesbrough 2003). DOT’s current partnership with incumbent 1 aligns with these theories, however, it is not viewed as the ideal solution from DOT’s perspective, as it hinders the commercialization of their technology. Although this partnership allowed DOT to validate its technology, in their interview, Mr. Van der Tempel stated that due to an imbalance of information sharing and the creation of mistrust, DOT’s ambitions were hindered.

Looking at DOT’s case through the lens of Transaction Cost Economics (TCE) theory, it can be observed that the decision to collaborate with İncumbent 1 aims at minimizing transaction

costs related to market entry (Ó. Williamson, 1979,1981). Practical examples pertaining these could be negotiating with multiple installation contractors or handling uncertainties during the commercialization process. Nevertheless, the interview with Mr. Van der Tempel underlined the disadvantages that come along with commercialization, namely the restricted information sharing and mistrust, which can be summarized under the increase of transaction costs concept from the TCE theory (Ó. Williamson 1981; O. E. Williamson 1979). Hence, the partnership reduces certain transaction costs but also introduces new internal transaction costs, showing that while DOT has something to gain from this coalition, it also has something to lose. The drawbacks of this commercialization have to be put against the advantages to determine if it is worth it for DOT.

Turning to the Technology commercialization theory, DOT's partnership with Incumbent 1 can be explained through the propositions of the framework. The theory highlights the importance of strategic alliances to provide essential resources and market access to startups (Teece 1986). DOT leverages the market position and technical capabilities of Incumbent 1. However, the partnership's limitations described by Mr. Van der Tempel suggest that a more balanced and trust-based collaboration method is needed to execute DOT's commercialization targets.

Although the current partnership method employed by DOT and Incumbent 1 appears to be in line with the theories described, the limitations that were mentioned indicate that the current partnership structure may not be the most suitable for DOT. In the next paragraphs of this section, alternative viable options will be analyzed to find the best solution for DOT's overall goals.

Among the previously mentioned collaboration methods, the Pilot project Support partnership would be a method that provides initial support (J. Freeman & Engel 2007). Although this is a beneficial method for startups that need funding, it might not be suitable for a long-term relationship. Therefore, this may not be a beneficial choice for DOT's long-term growth ambitions.

Having a distribution and licensing partnership would allow DOT to access different distribution channels that would ease DOT's market penetration. However, this partnership method can hinder their goal of becoming a service provider as Tipurić and Markulin (2002) argues that it can cause a loss of control over the product-customer interaction. Moreover, this method would limit DOT's independence as they would be forced to rely on the incumbent's performance, hence it stands in opposition to DOT's long-term goals.

On another note, selling the company could be an option for quick returns and avoiding

liability. However, DOT's ambitious goals indicate that acquisition is not a suitable option at their current stage. DOT aims to gain independence and become a service provider in this industry, for those reasons acquisition is the least fitting collaboration method for DOT.

Attracting investors is another viable alternative for DOT as it would help them increase their credibility (Schwarzkopf 2003) and get potential mentorship from investors that are familiar with the competitive nature of the market (Okanović et al. 2016). Nonetheless, Mr. Van der Tempel's vision for DOT is already planned and diluting ownership of the company can risk potential disagreements between the investors and Mr. Van der Tempel (Peng & Jiang 2010; Puroila 2018). In turn, this can cause a deviation from their target to respond to the pressure that arose to deliver quicker ROI (Roundy et al. 2017) which won't be beneficial for DOT in the long run.

After looking into all the alternatives available, both securing an engaged customer and a joint venture appear to be the most fitting options for DOT, as they maximize the gains and minimize the losses. By securing an engaged customer, DOT can generate quick revenue and would have the opportunity to acquire customer feedback (Chang & Taylor 2015; Pansari & Kumar 2017). This way they can implement the feedback to smoothen their market integration while still generating revenue. The only potential downside of this method would be that given the role of incumbent 1 in the IP, they might not be willing to let the development priorities be determined by an external customer which would be a potential rival to them (Prahalad, Ramaswamy, et al. 2000).

Taking this into consideration, the joint venture is therefore the most promising alternative for DOT. By forming a new entity with incumbent 1, DOT can enable the commercialization of the previously hindered slip-joint technology. Moreover, the new entity form can tackle larger projects with more ease as it would benefit from the resource pool provided from both DOT and Incumbent 1 (Doz 1987; Harrigan 1988). As mentioned in their interview, Mr. Van der Tempel hopes that the newly formed JV will be an autonomous entity that can acquire a significant market share. By eliminating the mistrust formed due to a lack of information sharing in the current parentship strategy, DOT can prosper with its innovation. This also justifies the choice made by Mr. Van der Tempel, as he is familiar with the wind turbine sector, their assessment of choosing a JV appears to be the most appropriate collaboration strategy. It offers them access to important resources of Incumbent 1 without losing any flexibility. This approach is also supported by the theoretical frameworks of this study that highlight the importance of well-aligned partnerships

(Gassmann & Enkel 2004).

5.2. Comparative analysis of the interviews

5.2.1. Question 1

The key takeaway from the table 4.2.3 is that most startups appear to prioritize customer feedback and data-driven processes in their decision-making mechanism. This emphasizes the engagement of the end-users and measurable metrics generated from them to evaluate productivity. Another important strategy that was used by 3 out of the 5 interviewed startups was the alignment and fit of the product development with the market demand. Depending on the market and industry, some startups such as startups 3 and 6 also mentioned the regulatory environment of their industry as an important factor contributing to the productivity evaluation of their efforts. Those regulations were specified as accelerators (case of startup 3 to implement more regulations to normalize their process) or hindrances (in the case of startup 6 where all the regulation-related processes were seen to slow down their processes) based on their impact on the product's commercialization. The awareness of the industry and its growth potential are less mentioned however also important tools for startups to balance the production process with realistic sales targets to produce a commercially viable product. Each company can choose their productivity assessment method and some can employ most of them to have a more comprehensive assessment (i.e. startup 5).

Based on the answers received, it was observed that the strategies vary significantly. While some are more data-oriented, others rely on broader indicators of success. This variety indicates the diverse strategies businesses may adopt based on their specific circumstances and goals. Startups 5 and 6 specifically drew attention to the importance of having a balance between product development and sales.

5.2.2. Question 2

Based on the table 4.3 built for the results of question 2, market adoption and technological complexity appear to be present in similar cases. This was also mentioned specifically during some of the interviews where the complexity of the product resulted in a lack of adoption due to consumer scepticism. To be able to improve market adoption, understanding the users is key. This was a challenge mentioned by startups 1 and 4. However as seen in the results for startups

2 and 5, understanding the user is not the only challenge. Once understood, companies have to earn their trust by proving their concept and building their brand name. These were challenges mentioned by startups 2, 5 and 6. One interesting result is that only startups 4 and 5 mentioned the challenges related to application scope and finding a market fit which normally would be expected to follow the same trend as understanding the user and earning their trust. An overall trend from these results can be observed where startups mostly seem to struggle to convince their users and understand them better.

Moreover, startups 3 and 6 indicated that they struggle with regulatory measures however from opposing perspectives, hindering the possible conclusion from these results.

5.2.3. Question 3

From the table 4.4, we can observe that startups employ a wide range of partnership models depending on their unique market situations and targets. While some focus on resource-sharing collaborations that help them expand in different markets, others aim to prioritize independence to maintain control in their effort to explore an existing or new market. The choice between collaboration and independence appeared to be a product-based solution as Startup 4 sold their company to be a part of a complete solution for the end user. Regardless of the model chosen, the timing of forming partnerships is deemed as crucial as seen in the case of Startup 4 benefited by proving its concept which led to the acquisition of their company.

One theme that kept recurring in each interview was trust, in complex sectors like cryptocurrency or disruptive innovative technologies (startup 2 and startup 6 respectively), increasing mutual trust was highlighted to be key to lowering the risks of partnerships. Another benefit of an established mutual trust is the potential knowledge transfer as emphasized by startups 5 and 6. By forming partnerships with bigger companies, startups can not only access a larger network but also learn from the mistakes and results of their partners.

5.2.4. Question 4

The overall result from table 4.5 highlights 4 key topics: Shared vision, complementary skills, financial goals and the needs of the specific market. As can be seen from the table above, sustainability and ethics, shared vision and goals, and complementary capabilities are the most

frequently appearing criteria. It can be therefore deduced that both a complementarity in the product and the company's vision are key. Both of these factors also indicate a complementary capability as by collaborating the product can be deemed a more ''complete solution''. Differing from the overall trend additional conditions such as exact end-user match or sales performance appear to be present only in startups 1 and 4 respectively.

Interestingly the criteria of trustworthiness and strategic alignment which can be associated with shared vision, were only mentioned by Startups 2, 4 and 5 respectively.

The overall analysis deducted from table 4.5, these answers point towards a preference for strategic, ethical and technological compatibility. These factors point towards a more holistic and value-driven approach in collaboration strategies among startups.

5.2.5. Question 5

Looking at the table 4.6 built from the interview answers, it can be seen that early customer engagement, adaptation and learning from customer feedback along with continuous product adaptation are the most frequent lessons mentioned. These are all following around the customer-centric development of the product. Many startups emphasize the significance of these factors to ensure that the final product meets the actual market demands and fits the user's needs.

Startup 1's ''sell before it's fully built'' strategy can act as a showcasing method to secure market interest and acquire funding. A big commonality to having a successful early stage appears to be achievable by following a simple yet careful development phase followed by clear communication. This can be additionally conforming for a startup environment as Startup 4 illustrated the difference in agility between large firms and startups. This reflects a broader understanding of how the startup culture impacts the ability to innovate and respond quickly to market feedback.

The results of the table indicate that Startup 6 has a very different approach compared to all the other startups. This can be due to the difference in their product as every startup except for 6 is developing software as either their main product or as a complementary product.

5.2.6. Question 6

Looking at the table 4.7, half of the interviewed startups indicated that they are open to partnerships while the other half appreciates independence and the freedom gained from it. Among the startups that are open to partner-up, licensing or leasing appears to be the most frequently given answer. Among the startups that prefer partnerships, emphasizing IP, investment searching and coping with rapid changes in the market appear to be common trends.

On the other hand, two of the three startups preferring independence indicated they are interested in suppliers and building relations with them instead of partnerships.

5.2.7. Question 7

Looking at the results of table 4.8, it can be observed that the common weakness indicated lies in the lack of technical, financial or human resources. Each startup used a different learning method to cover their weaknesses. They can be separated into two groups, the ones that outsourced by coaches or used literature knowledge such as startups 1,2 and 3 while others used an experimental approach to learn from mistakes and adapt market feedback (startups 4,5, and 6). The common strengths that were observed are the flexibility and fresh knowledge acquired due to their novel nature. Successful startups tend to be those that adapt their strategies to their specific circumstances and are proactive in filling their knowledge gaps.

5.2.8. Question 8

The results displayed in table 4.9 indicate that NDAs are the most commonly used method among the sample of startups in this study. Interestingly, none of the firms indicated that they have patents for their innovations. This is a contradictory case to DOT as they aim to commercialize their technology by utilizing their IP.

5.2.9. Questions 9-10

Given the differences in the answers received (displayed in table 4.10), it is difficult to identify a common pattern. It can be seen that the method chosen to tackle miscommunications and misalignments differs on the company culture. Each startup argued that their method worked well for them thus far proving that this is a very context-specific factor.

5.2.10. Second round of interview

The second interview round mostly confirmed the initial findings. An additional emphasis on the importance of patents alongside other IP protection strategies like NDAs was mentioned. This echoes the views of DOT's founder. Nevertheless, Startup 8's unique view on miscommunication highlights the importance of considering individual roles within the startup and their respective perspective in future studies. The interviewee disagreed with the impact observed by communication misalignments between the team.

5.3. Overview of the interviews

5.3.1. Main themes of the interviews

Based on the results of the questions analyzed above, the productivity assessment appears to be an important tool used by all startups interviewed. Startups prioritize customer feedback and data-driven decision-making, aligning product development with market demand, considering regulatory impacts, and balancing product development with sales to ensure productivity and commercial viability. This assessment was additionally related to a main challenge related to market adoption due to technological complexity and consumer scepticism. These are challenges that were mentioned frequently by both DOT and the interviewed sample, the answers gathered, underline the importance of understanding users, earning their trust through proven concepts, and addressing challenges in application scope and market fit, while also navigating diverse regulatory measures.

With regards to suitability for collaboration, the interviews showed that startups utilize diverse partnership models tailored to their market situations and goals, ranging from resource-sharing collaborations for market expansion to maintaining independence for control, with trust and timing in forming partnerships critical for success, especially in complex or innovative sectors. A preferred collaboration method did not surface, as a variety of different methods were employed. Startups value shared vision, complementary skills, financial goals, and market needs in their collaborations, emphasizing the importance of strategic, ethical, and technological compatibility for a holistic and value-driven approach. So the choice of a partner is not solely driven by resources, it has many additional layers to consider due to the flexible nature of the startups.

The third part of the interviews -the outcomes learned from the previous experiences- showed that startups emphasize early customer engagement, feedback implementation, and continuous product development, all focusing on customer-centric strategies. Successful early stages are often marked by clear communication and a simple development process, highlighting differences in agility and approach between startups and larger firms.

Regarding the views on partnerships, half of the startups mentioned that they are open to partnerships, often involving licensing or leasing, whereas the other half values independence, focusing on building relationships with suppliers rather than forming partnerships, with common partnership goals including IP management, investment seeking, and adapting to market changes.

Startups vary in preparedness, with those more prepared leveraging educational backgrounds and lean methodologies for adaptability, while less prepared ones face knowledge gaps in areas like sales or technology; nevertheless, all tend to use their unique strengths and learning methods—either through external coaching or experiential learning—to address weaknesses and enhance flexibility and market responsiveness.

Moreover, the implementation of diverse operational strategies was described to be essential to overcome some of the communication-related challenges. Startup 1 integrated engineers into the field of sales to enhance their holistic understanding of the company, Startup 5 emphasized shared goals and reflective breaks to manage team conflicts during commercialization along with tools like Forms, and Startup 6 advocates for adaptability and learning from project delays to improve future initiatives. The results indicate that conflict resolution strategies appear to be a necessity for startups as they are prone to miscommunications due to their flexibility and lean methodology. However, no specific strategy was determined to be optimal, as each startup argued that their method worked best for their peculiar case.

The last part of each interview touched upon risk management, more specifically IP protection. The results showed that startups predominantly use trade secrets and NDAs to protect their IP, with no startups employing patents and some (startups 1 and 5) intentionally not protecting their IP to encourage market competition and potentially stimulate market shifts.

The topic of exit strategies was not included in the second interview round due to the lack of response in round one. This contradicts the findings of the interview with the startup consultant in part 4.2.2 where this was specified to be an important factor.

5.3.2. Primary and secondary factors

Considering both rounds of interviews, the primary factors can be identified as the themes that re-occur the most. These primary factors can be described as prioritization of customer feedback and engagement, following a balanced, clear, and simple approach, and the importance of strategically tailored partnerships as almost every startup was engaged in a different kind. Regarding the strategically tailored partnerships, the analysis of questions asked under the section ‘’suitability for collaboration’’ demonstrated that there was no common trend in the collaboration methods chosen.

Following those factors, themes that were majoritarian -but not always- agreed can be identified as secondary factors. These secondary factors are the level of protection for IP, preparedness and adaptability of the startup. As seen during the rounds of interviews, the level of these 3 factors varied among different startups which can be seen as a context-dependent factor. Although a high level of adaptability and preparedness can be expected to be crucial, most examples shown in the interviews signify that the success of a partnership does not primarily depend on that. Therefore this can be seen as a secondary factor.

5.4. Applicability to DOT

Among the previously identified primary factors, the importance of strategically tailored partnerships is an important one for DOT. As the handbook of the slip-joint technology is held by incumbent 1, the technology is prevented from expanding in the market. It is therefore crucial for DOT to explore their various collaboration options. Mr. Van der Tempel indicated they preferred a joint venture to re-introduce the product to the market with a ‘’new label‘’ free from DOT’s and incumbent 1’s influence. He also added in the interview that his goal for this JV is to create a successful and autonomous entity that can function without the direct contribution of either company.

As seen from Table 4.12, each interviewee explained a different collaboration method and their reasoning for it. For DOT’s case, a joint venture appears to be the best fit as -unlike some of the interviewed startups- they need to convince the public and their potential customers that they are not dependent on incumbent 1 and that they can deliver this product without additional commitment from incumbent 1. The uniqueness of this case can also be seen by comparing DOT

to the interviewed startups as most of them need to prove their product by collaborating with other firms while DOT will achieve this by doing the opposite, cutting affiliations with the incumbent while keeping the partnership under a JV. As Pisano and Verganti (2008) highlighted in their research the hardship of ranking a certain collaboration method without knowing the specific context of the firm in question. Regardless of the partnership method chosen, the intel acquired by these interviews is valuable to form preliminary guidance for other startups. Several factors need to be taken into consideration while looking into the applicability of the findings to DOT.

An important factor to consider is the type of product offered. Similarly to DOT, startups 3,5,6 and 7, not only develop software but also manufacture hardware and deliver a physical product to their end users. This does not mean that the answers from the rest of the startups that develop software are not applicable for DOT but they may be considered different based on the context. Similarly, it is not possible to reflect DOT's case to any of the specific startups interviewed.

A good example of this can be given in the early market feedback and simplicity arguments. Contrary to the example of startups 2 and 4, DOT suffers from the simplicity of their products as described in the interview with Mr.Van der Tempel. However, just like Startup 2 stated, DOT suffers from the lack of visibility of their product (like a "black box" as Mr. Van der Tempel indicated) which leads to end-user scepticism. This is in line with the findings of Van der Loos et al. (2021), where the Dutch Wind turbine market was characterized as a difficult environment for innovations to prosper as the traditional methods appear to be very rigid.

A common point that was reflected by the interviewed startups was the importance of customer feedback and the data-driven insights taken from it. Similarly to Startup 2, as DOT's product is an operational improvement rather than a final product sold to the end customer, it is problematic to gain feedback. As indicated by Mr.Van der Tempel, the technology has been proven and they need to educate the market on its value similar to the case of startup 5. Therefore acquiring such feedback does not seem to be a feasible strategy for DOT. The preparedness of the startups is another factor that is not directly applicable to DOT as they have proved their preparedness by completing numerous demonstration projects and certifications. The lack of commercial performance of the slip-joint technology is due to the hindrance caused by their prior collaboration choices. Such challenges were not observed in any of the interviews mentioned.

Unlike most of the interviewed startups, DOT's IP protection is based on patents and agree-

ments assuring the safety of their technology. This is an interesting difference that was also observed between the two interview rounds. Startups in the second round highlighted the importance of patents while this opinion was not shared by the startups in the first interview round. The most commonly encountered argument by round 1 startups was the need to expand in the market and welcome competition to take the first-mover advantages while forming a new market. This is a very product-specific factor and given the maturity of the slip-joint technology, DOT's patent protection for their coated version of slip-joint does not need to attract more competition as DOT's ambition to become an IP seller and service provider can be hindered in the presence of competitors. This is in line with the findings of Alan Hughes (2010) as they highlighted that small firms are more likely to put their patents to productive use (such as service providing or licensing out the technology) compared to larger firms. It appears that the choice of protection can be related to the type of product or service the firm hopes to provide. The trend observed in this study shows that for novel technologies or disruptive innovations, copycats are welcome to induce the formation of a new market while that is not the case for incremental innovations. This can be an interesting topic for future research.

By reflecting on the findings from both interview rounds and connecting them to DOT's case, it becomes clear that key factors such as market education and trust-building, clear communication can help DOT overcome the suspicions associated with the simplicity of their product and help them build a stronger and more trusted presence in the market.

Although some of the insights gained from the interviews cannot be directly applied to DOT's case, they are still valuable as guidance for other startups and as an initial step to fill the gap in the literature.

5.5. Implication for Technology entrepreneurs

The results of this study have important implications for startups looking to form effective partnerships to advance the commercialization efforts of their innovations. The insights gained from the case study of DOT along with the comparative analysis provide important information to help firms navigate the complex landscape of partnership formation and technology commercialization.

The case study of DOT indicated that collaboration methods need to be tailored very carefully as each method has their advantages and disadvantages. In DOT's case, the JV option appears to

be the most suitable one as it is the only solution to their current hindered commercialization efforts that does not involve losing any additional control. Similarly, to DOT, new startup founders should also weight in the options to decide which method would be more fitting. It is important to note that there are several layers in this decision such as the influence of the market or current partners in DOT's case. Regardless of the method chosen, the comparative study results indicated that fostering a culture of flexibility within the startups is necessary. By being adaptable to changing situations, it can help entrepreneurs navigate uncertain situations effectively. The results from the comparative analysis helped the identification of primary and secondary factors. Although the applicability to DOT showed that most of these factors are not context specific, it represents a good guide for initial steps of new startups. Technology entrepreneurs should prioritize mechanisms that gather customer feedback to ensure that the actions of the chosen partnership remain customer-centric and responsive to the market needs. Moreover, developing a clear and equitable agreement with the new partners is crucial to build trust and avoid conflicts or mistrusts similar to DOT's case.

With regards to IP protection, the strategy followed can vary depending on the product and the market. Although the majority of the startups involved in this study had robust measures to safeguard their innovation, some chose to neglect this protection to expand faster and catalyze a new market creation. The observed trend in this study indicates that startups with innovations that have a disruptive effect on the market had less vigorous IP protection strategies to welcome competitors and form a new market. DOT's strategy to commercialize their IP is also an important option for entrepreneurs as they aim to become a service provider in a well-established market.

By integrating these recommendations along with the primary and secondary factors identified previously, technology entrepreneurs can form long-lasting and efficient partnerships with incumbents. This research hopes to assist new entrepreneurs by giving them insight from other more established startups. This approach not only addresses the gap that was identified in the theoretical analysis, but also serves as a practical guide for new startups aiming to expand in competitive markets by employing strategic collaborations.

6

Conclusions and Limitations

6.1. Limitations

The results of this study need to be interpreted in light of the limitations. Firstly, the sample size is limited and therefore cannot cover all the peculiarities that start-ups can face. The sample size of this case study was small, limited to only 8 startups including DOT. This was due to the time limitations of this study however future research should incorporate a larger sample size in order to increase the generalizability of the findings.

Moreover, not all interviewees were in leadership positions or involved in strategic decision-making processes. Thus, differences in interviewee's positions were not accounted for. This was observed during some of the interviews with engineers (startups 6 and 7) as their knowledge about the company's future strategies and goals was limited. Future research should involve either a more diverse group of analyses to include different perspectives and analyze them according to ranking (i.e. a group of leaders or engineers only).

Moreover, the limitation related to bias does not include only the participants but also the researchers. Increasing the number of researches and employing complex statistical data analysis can help counteract the biases of individual researchers. By including a broader range of perspectives, the likelihood of biases can be decreased. Regarding the methodology employed in this study, future research can involve statistical analysis such as factor analysis in order to increase accuracy and eliminate personal biases. Costello (2005) highlighted the benefits of factor analysis

in their research. They found that it can lead to more insightful and accurate conclusions as it doesn't fully rely on one factor like one person's judgement in the case of this study but rather on objective factors.

The results are entirely based on the judgement and opinions of the interviewees. These measures are subjective and cannot be entirely representative of the objective truth. For example, the study only looked at what each startup thinks about their achievements with partnerships but not at objective data that would indicate the success of the partnerships such as specific sale or performance numbers. This was due to the confidentiality agreement of this research. Nevertheless, objective data can help future research to analyze this topic from a different perspective. By combining objective and subjective data, a more holistic view of these factors can be obtained as highlighted in the research of Hall and Rist (1999).

As mentioned during the analysis part, given the differences in size and field between startups, it is rather difficult to draw general conclusions. When analyzing the data, the size of the startups and their stage of development were not taken into consideration. These factors can play an important role in the strategy and decision-making processes. Blank and Dorf (2020) suggests that challenges specific to these factors can significantly influence the startup's performance. For example, smaller startups can have different resource constraints and therefore different growth opportunities compared to more established startups. Therefore future research should also take these variables into account.

6.2. Conclusions

This research delves into the strategies used by startups in forming collaborations. The inclusion of the case study with TU Delft spinoff DOT highlights the opportunities and challenges faced in the renewable energy sector. Additionally, two rounds of interviews for comparative analysis allow for the identification of primary and secondary factors contributing to these strategies.

The results of DOT's case study indicate that a strategic partnership is necessary for the successful commercialization of DOT's slip-joint technology. The SWOT analysis, market analysis, and interview with DOT's founder show that despite strengths and opportunities such as market demand and innovativeness, the weaknesses and threats related to the wind turbine

market and their current partnership structure outweigh these benefits. The heavy reliance on Incumbent 1, along with the lack of a startup-friendly environment, presents serious challenges for DOT in their efforts to commercialize their IP and services. The findings from the interview and literature indicate that DOT's current partnership aligns with some theoretical frameworks mentioned in this study, such as open innovation and RBV. However, significant drawbacks, such as restricted information exchange, create mistrust between the firms. While TCE theory suggests that partnerships lower transaction costs, an increase in internal transaction costs is observed in DOT's case due to the mistrust. Furthermore, while the Technology Commercialization theory emphasizes the need for a strategic alliance, DOT's current partnership limitations indicate the need for a more trust-based and equitable alliance.

Exploring alternative partnership methods for DOT demonstrates that the formation of a joint venture is the most promising strategy. DOT's specific case underscores the importance of strategically tailored partnerships. The preference for a JV is justified by external reasons such as market competition and current alliances. With the formation of a JV, DOT can reintroduce its coated slip-joint technology to the market under an autonomous entity. The conclusions from the interviews show that DOT's strategy would benefit from focusing on clear communication with potential customers and market education to demonstrate the proven value of their product and services. This approach also aligns with the primary and secondary factors highlighted in the comparative analysis.

The main themes for the comparative analysis are productivity assessment, suitability for collaboration, startup dynamics, risk management, communication and alignment, and exit strategies. While the first round of interviews is crucial to determine the most important factors and lessons learned by startups, the second round serves as a verification step for these findings. The results are very context-specific, making it difficult to build a framework for other startups.

Nevertheless, both rounds of interviews show that startups can focus on various factors identified as primary and secondary based on their frequency of appearance in the comparative tables. The primary factors identified are the prioritization of customer feedback and engagement, following a balanced, clear, and simple approach, and the importance of strategically tailored partnerships. An emphasis on the importance of strategic, technical, and ethical compatibility is observed. While

the interviews reveal that IP protection, the level of readiness of the startup, and adaptability are important, they are not always the primary focus of startups. Therefore, the secondary factors identified are the level of protection for IP, preparedness, and adaptability of the startup.

Although the results of this study are mostly context-specific, this research serves as a good start to address the gap in the literature. The limitations identified during this research can help other researchers build on this study and yield a more comprehensive analysis that would be beneficial for all startups in general. Startups are essential actors in sustainable innovation, and their success and strategic collaborations can have a significant impact on the global shift towards sustainable practices.

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Appendix

Figure A.1: DOT's coated slip-joint patent overview

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(54) Title: OFFSHORE STRUCTURE COMPRISING A COATED SLIP JOINT AND METHOD FOR FORMING THE SAME

(57) Abstract: Offshore structure comprising a pile of a foundation and at least one offshore element, mounted on the pile, forming a slip joint, wherein between an inner surface of the offshore element and an outer surface of the pile: - a coating, especially an anti-fouling coating is provided, increasing friction between the said two surfaces and/or preventing corrosion of one or both of said surfaces and/or - at least two spaced apart areas are provided with a substance, forming a seal between the said outer surface and the said inner surface, near an upper end of the pile and the off shore element and between a lower end of the off shore element and the pile.

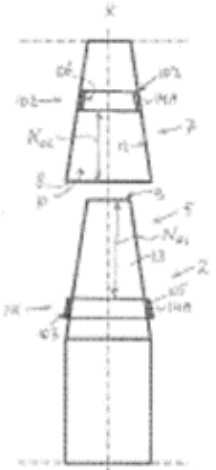

Fig. 12

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For the remainder of the appendix, refer to the ”APPENDİX-CONFİDENTİAL” folder attached to this report.