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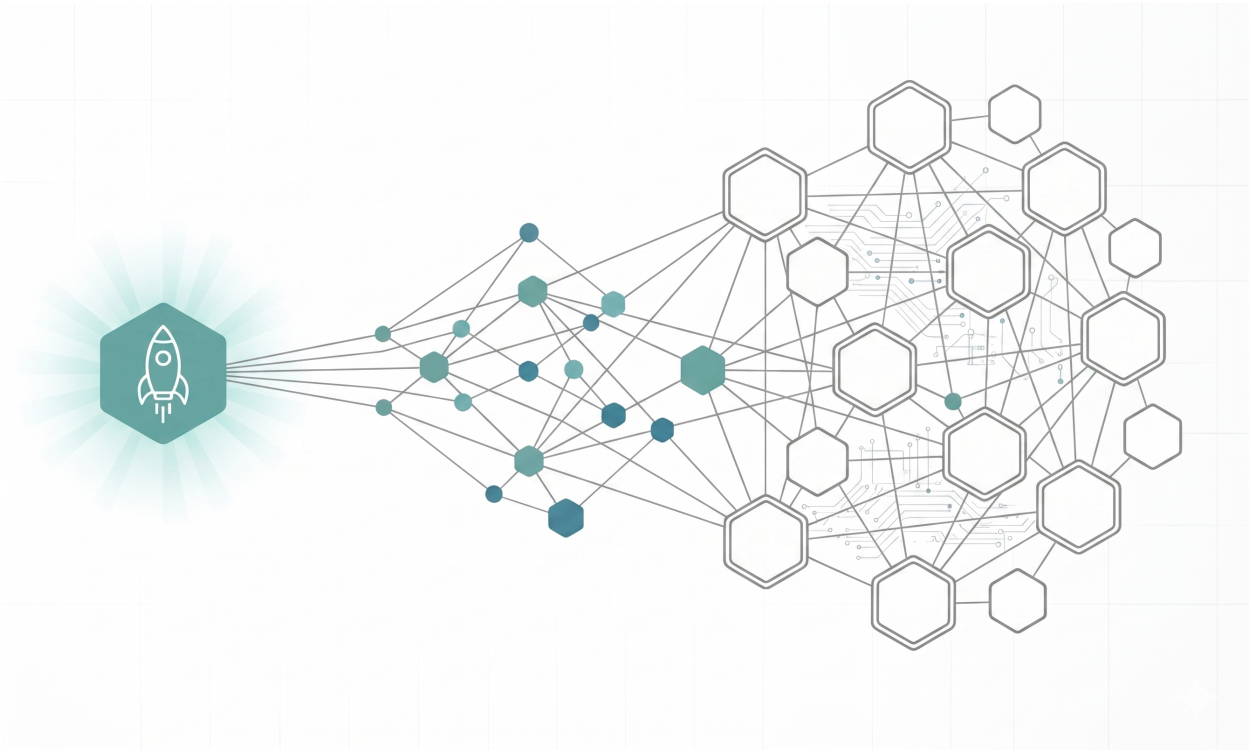

Converting ties into trust

How networks, entrepreneurial capabilities, and legitimacy, shape the survival of early-stage medical device startups

Master's thesis in Management and Economics of Innovation

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Cover: A startup connecting to the larger industry network, moving from an outsider to an insider. AI generated.

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Abstract

Building and sustaining a new venture is inherently difficult with more than two-thirds never delivering a positive return to investors. The medical device industry presents a particularly interesting context in which to study this, characterised by extensive regulation, long capital-intensive development timelines, and the need to satisfy multiple demanding stakeholders, including patients, clinicians, investors, and regulatory bodies.

This study explores how early-stage medical device startups (MDSs) build legitimacy through network development, and how these processes shape venture survival. An exploratory qualitative approach was adopted, drawing on fifteen semi-structured interviews with MDS founders, support organisation representatives, and experts across primarily the DACH region and the United States. The data were later analysed through thematic analysis.

The findings show that transitioning from outsider to insider within the established industry network is an iterative process driven by persistent weak-tie cultivation, repeated interaction, and sustained visibility at industry events. Affiliation with supporting actors - universities, hospitals, incubators, and advisory boards - accelerates both network access and legitimacy signalling through spillover effects. Legitimacy emerges as a continuous, multi-source process in which clinical data constitutes the primary currency, but must be complemented by additional legitimacy signals to satisfy key stakeholders. Team composition is identified as a critical and often underestimated factor, with dysfunction found to actively block access to capital and damage legitimacy.

The central contribution of this study is that networks, entrepreneurial capabilities, and legitimacy are interdependent and form a self-reinforcing system. Entrepreneurial capabilities function as the connective mechanism enabling founders to translate network relationships into legitimacy signals and vice versa. They enable and constrain each other, and it is the founder's ability to develop and maintain momentum across all three simultaneously that determines early-stage MDS development.

Keywords: Legitimacy, social capital, networks, entrepreneurial capabilities, venture survival, medtech, medical device startup.

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Erik Junkers & William McGillivray, Zurich, May 2026

List of Acronyms

Below is the list of acronyms that have been used throughout this thesis listed in alphabetical order:

IP	Intellectual Property
KOL	Key Opinion Leader
LoI	Letter of Intent
MDS	Medical Device Startup
SC	Social Capital
VC	Venture Capital

Contents

List of Figures

List of Tables

1
Introduction

The introductory chapter establishes the study's background and demonstrates the relevance of the subject. It outlines the purpose and research questions, concluding with a brief discussion of the study's delimitations.

1.1 Background

New ventures have a positive effect on economic growth, society and the environment (Azeem & Khanna, 2024; Liao et al., 2008; Gilmore et al., 2013; Roundy, 2018), with entrepreneurship also linked to improved innovation performance (Cui & Song, 2022). Yet, despite this potential, more than two-thirds never deliver a positive return to investors (Eisenmann, 2021). This represents a loss of socioeconomic and environmental benefits, underscoring the importance for understanding the processes through which new ventures develop and establish themselves within their industry. Previous research has approached this from several angles focusing on critical success factors such as funding, business models, and firm characteristics (Baskoro et al., 2022; Díaz-Santamaría & Bulchand-Gidumal, 2021; Santisteban et al., 2021; Sevilla-Bernardo et al., 2022); or on individual-level characteristics associated with entrepreneurial success (Birley, 1985). Although these success factors and individual traits are required for startups to succeed and have shown positive effects on entrepreneurial performance, they are rarely enough to fully account for how new ventures develop and sustain themselves over time.

Additional views on entrepreneurship therefore have to be understood as well, and research has showed how social connections influence startup creation and development (Baraldi et al., 2019). This network-based perspective is also supported by Eisenmann (2021), who identifies dysfunctional relationships with key stakeholders as one of the main reasons for early-stage failure. The challenge of building such relationships is closely tied to the *liability of newness*, which describes how the mortality risk is highest during venture formation, partly due to a lack of firm relationships and established track record (Stinchcombe, 2000; D. A. Smith & Lohrke, 2008). Overcoming this liability requires new ventures to actively build credibility with surrounding actors and secure access to resources (Zimmerman & Zeitz, 2002), which demands certain capabilities of the founding team (Hoang & Antoncic, 2003; Eesley et al., 2014). How founders navigate this process and which relationships prove most valuable, has therefore been a question of interest in entrepreneurship research (Baraldi et al., 2019).

While the importance of social networks and entrepreneurial capabilities in entrepreneur-

ship is well established individually, entrepreneurial innovation is highly context dependent (Autio et al., 2014). Due to its unique environment and challenging attributes, the medical-device industry provides a compelling context to study these dynamics. It is characterised by high technological complexity, strong regulations, and close interaction with healthcare systems (Kalinowska-Beszczyńska & Prędkiewicz, 2024; Svempe, 2024; Thimbleby, 2013). Furthermore, developing and commercialising a medical device requires navigating complex regulatory hurdles, clinical trials, and long and capital intensive development timelines (Kalinowska-Beszczyńska & Prędkiewicz, 2024).

A particular tension arises in the context of the liability of newness. As De Clercq & Voronov (2009) explain, newcomers in established industries conform to norms to gain legitimacy, while simultaneously deviating from them to create innovation. In medtech, this tension is increased by the need to satisfy multiple stakeholders, including patients, healthcare providers and staff, governments, and insurance companies (Nilsen et al., 2020). Building on this, Weimar et al. (2024) emphasise that health technology startups must not only satisfy these groups but also secure their support through partnerships to succeed. Legitimacy has therefore been identified as a key component of new venture development in this sector, enabling startups to access the important resources needed to progress (Zimmerman & Zeitz, 2002; Bengtson et al., 2022). Legitimacy is not built in isolation but rather through the relationships with other network actors, where other actors play a central role in signalling and transferring legitimacy (Li et al., 2024; Kansheba et al., 2024), making network development and legitimacy closely related. At the same time, the ability to navigate this depends on the entrepreneurial capabilities of the founding team (Pennetta et al., 2024). Together networks, legitimacy and entrepreneurial capabilities form a foundation for understanding how early-stage Medical Device Startups (MDSs) develop.

1.2 Purpose and research questions

Given the distinct conditions present in the medical-device industry, understanding how entrepreneurial networks, legitimacy and entrepreneurial capabilities interact in this context presents an interesting opportunity for further exploration.

The purpose of this study is therefore to explore how early-stage medical device startups build legitimacy through network development, and how these processes shape venture survival. To address this, the study is guided by two research questions:

1. *How can founders establish network connections to support the survival of early-stage medical device startups?*
2. *How do founders of medical device startups build legitimacy among key stakeholders during early-venture formation?*

1.3 Delimitations

To maintain a focused scope, two main delimitations were established. First, the study focuses on ambulatory MDSs, developing products that do not confine patients to hospital settings. While the medical-device industry has a broad range of products and technologies, this narrowing allowed for a more focused investigation of MDSs operating under comparable regulatory and commercial conditions. Second, the study focuses on early-stage MDSs that have already initiated market entry, defined as having produced and sold its first product. This was done to ensure that founders had the relevant entrepreneurial history to be meaningfully studied.

2

Theoretical background

This chapter presents the theoretical background of the study. It begins by introducing the concept of networks in an entrepreneurial context and how value is created within them. The focus is then turned to entrepreneurial capabilities, what they are, why they matter, and how they are developed both internally within a team and through external support. Lastly, legitimacy theory is introduced and strategies for building legitimacy are explored.

2.1 The network foundation

For a startup, their network of connected actors constitutes an important part of their survival, as it provides access to essential resources such as capital and knowledge (Durda & Ključnikov, 2019). Within these networks, both the startup's position in the network and the quality of its relationships play an important role in venture initiation and growth (H. Aldrich & Zimmer, 1986). The role of the founder(s) is important here, as their access to personal networks and ability to build external relationships influence the information and resources available to the venture (Kotha & George, 2012; Witt et al., 2008).

2.1.1 Entrepreneurial networks

A network consists of nodes (actors) and connections between these nodes (dyads), which form a network (Walker, 1988). Entrepreneurial networks constitute an important mechanism through which ventures connect with key external actors including customers, suppliers, collaboration partners, universities, and competitors, to access ideas, knowledge, and critical resources (Baraldi et al., 2019; Acs et al., 2017).

Hoang & Yi (2015) identifies three main elements of entrepreneurial networks: network content, governance mechanisms and network structure. Network content refers to what is exchanged between actors, such as information and advice, but it can also include signalling and reputational content. The value of such content is illustrated by Stuart et al. (1999), who found that early-stage firms with ties to high-status partners performed better, where the partner ties provided them with an indirect quality signal. Governance mechanisms refer to the way relationships between actors are regulated and controlled (Hoang & Yi, 2015). Trust is an essential factor here, as it allows the assumption that both parties will act in mutually acceptable ways, which is consistent with Arrow (1974)'s description of trust as a facilitator of economic exchange. Network structure refers to the overall pattern of actors and includes three key dimensions (Hoang & Yi, 2015). First, *size* refers to the number of links between the startup and actors (Katila, 1997; Semrau

& Werner, 2009). Second, *centrality* describes the degree of access to other actors in the network (Brajkovich, 1994). Third, *diversity* reflects the variety of resources available in the network (Granovetter, 1973).

A useful lens to understand network structure is through Granovetter (1973)'s distinction between weak and strong ties. Strong ties are characterised by frequent interaction, close emotional connection and reciprocity, while weak ties are more distant connections with lower amounts of interaction. Importantly, weak ties can be used to bridge disconnected groups (Granovetter, 1973), making them especially valuable for a startup to access resources outside of their immediate network (Nozawa & Kang, 2025).

The type of ties a startup has with other actors tends to evolve as the startup develops. Hite & Hesterly (2001) explain that startups initially are often heavily reliant on embedded ties, which are relationships built on trust and mutual dependence, such as family members and close associates, which corresponds closely to Granovetter (1973)'s strong ties. This reliance on embedded relationships partly reflects the liability of newness, a phenomenon describing how the mortality risk is highest during venture formation (Stinchcombe, 2000), attributed to the lack of firm relationships and lack of an established track record (Stinchcombe, 2000; D. A. Smith & Lohrke, 2008), as introduced in section 1. While the phenomenon can hinder the development of important network ties (Stinchcombe, 2000), social and reputational connections can help mitigate these challenges (Lechner et al., 2006). However, this points to a circular dependency, where building reputation requires prior relationships, while establishing such relationships is difficult without an existing reputation. As the startup grows and develops, the network development becomes more intentional, and newly established relationships are often at arm's length, but with greater resource availability (Hite & Hesterly, 2001). This evolution from embedded ties towards more opportunity-based, weak ties (Hite & Hesterly, 2001), reflects how a startup grows and repositions within the network (Slotte-Kock & Coviello, 2010).

Understanding the structure and content of a network at any given moment is, however, insufficient. The entrepreneurial network is dynamic and evolves over time (Hite & Hesterly, 2001), requiring startups to react to internal and external changes (Baraldi et al., 2019). Network actors can enter and exit, cultural and social contexts can change, and market conditions can shift (Slotte-Kock & Coviello, 2010), creating both opportunities and obstacles for the venture (Baraldi et al., 2019). This requires the startup to actively manage and adapt its network over time (Jack, 2010).

2.1.2 Social capital

Describing the structure and dynamics of entrepreneurial networks does not, however, fully account for the value these connections generate for the startup. The value gained through entrepreneurial networks can be explained through the concept of social capital (Brodie et al., 2017). Nahapiet & Ghoshal (2009) define social capital as the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Through

social capital, entrepreneurs can develop and maintain mutual support, trustworthiness and legitimacy in the business environment (McKeever et al., 2014). Social capital can further be split into bonding and bridging social capital. Eklinder-Frick et al. (2011) define both: bonding social capital refers to strong ties within homogenous groups, such as family and close friends, often excluding interaction with others; bridging social capital refers to interaction between different social groups, having looser bonds with one another.

To better understand how networks generate value for startups, social capital can be seen from three dimensions: structural, relational and cognitive social capital (Crowley & Barlow, 2022). Structural social capital involves the roles, institutions and precedents that form how people are connected prior to any direct interaction. For startups, structural social capital provides visibility on what opportunities exist and who potential collaborators could be (Rasmussen et al., 2011). One example is a university spin-off, which possesses a pre-existing network of university contacts that they can utilise (Rasmussen et al., 2011). Relational social capital explains the strength of relationships within the network, where trust plays a substantial role. With strong relational ties, a startup can make greater use of their network, acquiring various resources such as market information, ideas and venture funding (Walter et al., 2006; Hoang & Antoncic, 2003; Nicolaou & Birley, 2003). Cognitive social capital refers to the shared norms, values, goals and interpretations that enable coordinated actions within a network, and as Lee & Jones (2008) note, it is crucial for the development of relational social capital, as trust is facilitated through shared visions and understanding.

2.1.3 Network embeddedness and value creation

While social capital explains the value in networks, the ability to access the value depends on how deeply embedded the startup is within the network (Jack & Anderson, 2002). For startups entering a market, a central challenge is therefore moving from an outsider to an insider position within established business networks (Bengtson et al., 2022). This challenge can be understood from the concept of the *liability of outsidership*, which occurs when a venture is not positioned within the network, making it impossible to develop the business (Johanson & Vahlne, 2009). Although the concept originates from a venture internationalisation perspective, it applies equally and has been used in situations where firms lack established networks in the market they enter (Guercini & Milanesi, 2016; Hammoda, 2024; Schweizer, 2012). Johanson & Vahlne (2009) further elaborate that a venture without established network ties is structurally unable to access the knowledge, trust and opportunities that are only accessible from inside the network. Beyond this, outsidership also implies an absence of legitimacy: without an established position the venture struggles to be perceived as credible and reliable by other actors (Guercini & Milanesi, 2016; Jack & Anderson, 2002), which further constrains its ability to form relationships with other actors (Schweizer, 2012).

To overcome the liability of outsidership, Schweizer (2012) suggests a venture needs to recognise the outsider position and then start to identify the relevant actors inside the network - who they are, how they are connected, and where the venture can position itself. To find ways to fit in, this often begins through exploiting existing weak ties (Schweizer,

2012), which are distant connections that can provide access to other actors (Granovetter, 1973). However, the venture needs to actively invest in these relationships to make them stronger (Sirmon et al., 2009), for example by offering a mutually beneficial deal (Schweizer, 2012). On a higher level, this process of strengthening relationships involves accumulating knowledge, building trust, and in the end, inducing greater commitment among the startup and actors (Zajac & Olsen, 1993; Anderson & Weitz, 1992). In other words, this process of a venture embedding itself in the network involves sustained interaction, developing credibility and acquiring knowledge about how the network functions (Jack & Anderson, 2002), eventually enabling the venture to move from an outsider to an insider position. Achieving this position allows the firm to discover and exploit beneficial opportunities that otherwise would not be accessible (Blankenburg Holm et al., 2015).

Value creation within entrepreneurial networks can be further understood from a systems perspective, where the different actors influence one another, causing value to not be created at one place in the system alone (Harrison & Wicks, 2013). Instead, it works as a value creation cycle where multiple actors can benefit from each other simultaneously (Harrison & Wicks, 2013). Allee (2009) further explains that this necessitates a broader understanding, where value is explained by looking at the network in its entirety instead of adding individual contributions. In this view, which is illustrated in Figure 2.1, actors participate in the network by converting their tangible and intangible assets into negotiable outputs that other actors can receive and build upon, creating a process of value conversion that flows across the network (Allee, 2009). This is in line with Re & Magnani (2023)'s findings, showing that engaging in close collaboration with actors can stimulate joint value creation for involved partners.

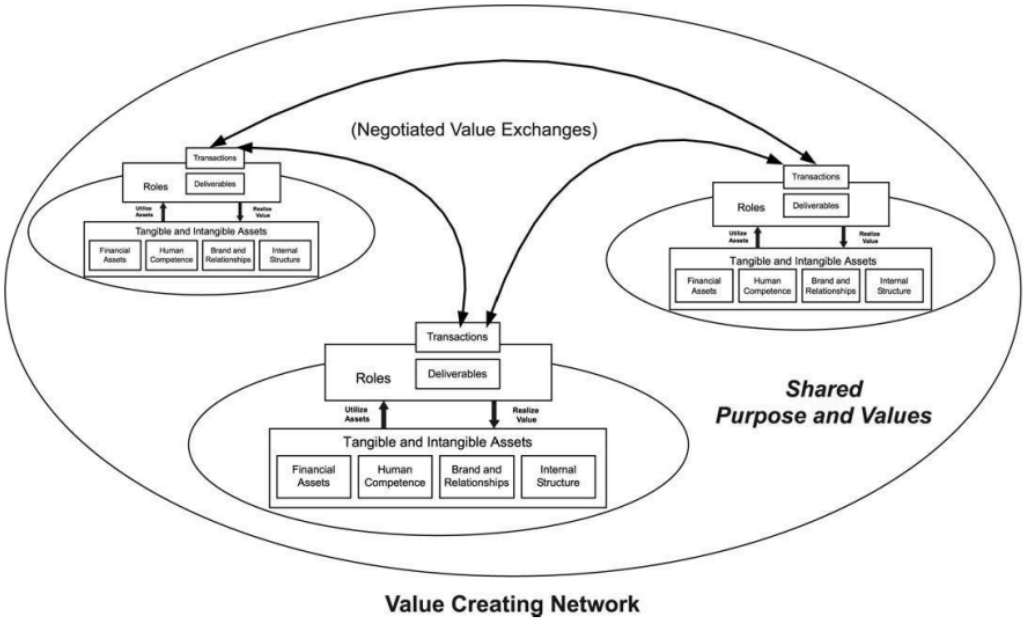

Figure 2.1: Allee (2009)'s value network strategy model.

Despite the collaborative potential within entrepreneurial networks, interactions between actors can generate tensions and conflicts (L. Smith & Woods, 2015). Since actors often

have different objectives, expectations and incentives, disagreements may occur regarding decisions and resource-allocation (Harrison & Wicks, 2013; L. Smith & Woods, 2015). Such decisions can be particularly significant in entrepreneurial innovation settings, characterised by uncertainty, resource scarcity and changing market conditions, when innovations benefit some actors while creating disadvantages for others (Dew & Sarasvathy, 2007). To maintain cooperation and coordination in the network, it can be necessary to establish efficient mechanisms to govern and handle these tensions (L. Smith & Woods, 2015; Poppo & Zenger, 2002). These governance mechanisms may both be informal and formal, and can regulate how interactions with actors take place (Hoang & Antoncic, 2003). Formal governance can include contracts, ownership structures and clearly defined roles (Poppo & Zenger, 2002; Krackhardt, 1990), while informal governance involves trust, shared norms and commitment (Hoang & Antoncic, 2003; Anderson & Weitz, 1992).

2.2 Capabilities of the venturing team

Networks and social capital provide the scaffolding through which startups access resources. Yet the ability to activate and benefit from the network is dependent on people. The composition and capabilities of the founding team shape the venture's capability to engage with their network and identify opportunities (Hoang & Antoncic, 2003; Eesley et al., 2014). In addition, an increase in an entrepreneur's skills and knowledge throughout the first years of a startup's life, positively contributes to firm survival (Gartner et al., 1999). Previous research in the field of entrepreneurship focuses primarily on the individual, and in some cases the organisation, to investigate entrepreneurial competences, characteristics, and behaviours (Rusu et al., 2012; Luor et al., 2013; Chhabra et al., 2023). The research describes concepts related to entrepreneurial skills and abilities, but the definitions of these concepts vary somewhat in the literature. Henceforth, the main term used to describe general entrepreneurial abilities, skills, and competences will be *capabilities*, while other terms may be applied in the case of specific distinctions.

2.2.1 Entrepreneurial capabilities

As noted previously, a new venture can gain crucial knowledge and access to resources through the ecosystem within which it acts (Baraldi et al., 2019; Acs et al., 2017), but the venture must also create and acquire entrepreneurial capabilities and resources itself (Pennetta et al., 2024). One reason for this is that the entrepreneurial capabilities of the founding team can impact the success of the venture (Mund, 2021; Eesley et al., 2014; Gruber et al., 2008). Among the frameworks used to conceptualise entrepreneurial capabilities, dynamic capability theory can offer a valuable perspective. Seeing as startups operate in an environment characterised by high market uncertainty, time pressure, complexity and rapid technological change (Zayadin et al., 2023; Pennetta et al., 2024), the concept of entrepreneurial dynamic capabilities as an adaptation mechanism becomes particularly relevant. Originally introduced by Teece et al. (1997), it describes a firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. The concept has primarily been used on firm level but has since also been applied to the individual level (Thomas et al., 2020; Vu, 2020; Boccardelli

& Magnusson, 2006; Helfat & Peteraf, 2015).

Teece (2012) applied it on the individual level, arguing that to sustain dynamic capabilities, leaders must possess *sensing*, *seizing*, and *transforming* skills. Put differently, Teece (2012) explains that entrepreneurship involves identifying opportunities, taking initiative, and creatively combining resources. Rather than optimising existing procedures, it focuses on figuring out future opportunities and challenges, and how to address them. The concept has been further developed in an entrepreneurial capabilities context, where Vu (2020) proposes that entrepreneurial capabilities consist of four dimensions focused on sensing, selecting, shaping, and synchronising opportunities. Sensing involves spotting market and technological opportunities (Klein, 2008), for example through alert scanning and searching (Tang et al., 2012), but also experimenting (Dyer et al., n.d.) and imagining (Klein, 2008; Kier et al., 2026). Selecting and shaping instead involves coordinating internal and external capabilities and resources to realise opportunities, while synchronising involves exploration and exploitation of opportunities (Vu, 2020).

Moreover and as outlined earlier, the importance of where entrepreneurship takes place should be considered (Welter, 2011; Autio et al., 2014). Baumol (1990) point out that the rules of the game in entrepreneurship "change dramatically from one time and place to another", which suggests that entrepreneurial capabilities are highly context dependent. In light of context dependency, De Massis et al. (2018) introduces sector-based entrepreneurial capabilities, which are "the capacities of an entrepreneurial actor to prospect, develop, and exploit opportunities by reconfiguring human, social, and financial resources within and across industry sectors". An example of such context-specific capabilities is provided by Thomas et al. (2020) who identify entrepreneurial capabilities important in the pre-formation phase of science-based university spin-offs. Extending the dynamic capabilities perspective, Thomas et al. (2020) highlight four capabilities; technology-market matching, claiming and protecting the invention, attracting and mentoring the founding team, and strategic timing of firm formation. Thomas et al. (2020) explain that technology-market matching primarily relates to sensing and shaping opportunities during early research phases whereas claiming the invention, building the founding team, and timing the firm formation are instead related to seizing these opportunities.

2.2.2 Venture team composition

While the previous section emphasised the importance of individual entrepreneurial capabilities, this section instead focuses on the venture team and the composition of individuals. Seeing as about 80% of new ventures today are team-based (Bolzani et al., 2019), and that the team plays a significant role in investment decisions and venture success (Agarwal et al., 2016), understanding their composition is important. There exists a disagreement on whether ventures perform better with an individual entrepreneur versus a full team, where one side argues for team-based ventures (e.g. Bolzani et al. (2019); Eisenhardt & Schoonhoven (1990)), and another argues for higher performance with solo entrepreneurs (Greenberg & Mollick, 2018). Still, it is a common view that co-founded teams perform better and investors often disregard solo founders (Greenberg & Mollick, 2018), which is not surprising given that a new venture formation requires a wide set of skills and resources

that few individuals possess on their own (Klotz et al., 2014; Carland & Carland, 2012). The more relevant question then is not whether to build a team, but how to compose the team effectively.

Ensley & Hmieleski (2005) identify four dimensions of heterogeneity in venture team composition: educational background, industry experience, functional expertise, and skills. Educational background refers to how similar academic backgrounds the venture team has, while industry experience refers to the number of years an individual has been active in the relevant industry (Ensley & Hmieleski, 2005). Prior industry experience in particular, provides venture teams with knowledge about markets, suppliers and the industry (Jin et al., 2017), and produces social capital (Florin et al., 2003), which in turn is valuable for accessing critical resources and initiating new business relationships (Burt, 1997). Focusing instead on functional expertise, this represents the degree to which the venture team has overlapping capabilities (Ensley & Hmieleski, 2005). Lastly, skills can be divided into three categories: technical, human, and conceptual. Technical refers to competencies within different functional areas, human refers to the ability to interact with diverse groups, and conceptual refers to the ability to learn (Ensley & Hmieleski, 2005).

The core question regarding entrepreneurial team heterogeneity is if greater heterogeneity positively effects venture success. There exists a compelling amount of research on the topic, but findings are contradictory or not comparable (Sundermeier & Mahlert, 2023). When researching team heterogeneity, studies use different parameters, making it difficult to compare (Jin et al., 2017; Ensley et al., 1998). Nevertheless, on one hand, heterogeneous teams may be more successful than homogeneous teams because they can utilise a wider range of knowledge and different perspectives (Hambrick & Mason, 1984; Chattopadhyay et al., 1999; Chowdhury, 2005). On the other hand, heterogeneous teams have been found to involve more interpersonal conflicts, causing decreased team performance (Kollmann et al., 2016; Khan et al., 2014).

Composing a team is an iterative process, where founders must balance interpersonal attraction – seeking individuals with whom they already have close relationships or similar personalities – and resource seeking – identifying team partners with complementary competencies (Lazar et al., 2020). Here, a hybrid strategy can be employed, where additions to the venture team occur from attention to both similarities and complementaries (Lazar et al., 2020). Iteratively developing the team and adding competencies has been seen as particularly relevant in the context of university spinoffs, where initial credibility is often low and external stakeholders are uncertain about the venture's potential (Rasmussen et al., 2011). Rasmussen et al. (2011) show that credibility of university spinoffs is heavily dependent on team composition and often requires recruitment of members with complementary competencies, since academic founders frequently lack what is needed to engage with external stakeholders and secure resources on their own. More importantly, the study argues that the competencies required for a university spinoff does not typically come from a single individual. Instead, competencies are developed through contributions from different actors to build a diverse set of team competencies.

2.2.3 Mentoring and external support

Whereas entrepreneurial capabilities and venture team composition describe what the team brings to the venture initially, the development of those capabilities can also be affected by external guidance. With strong ties to the concept of social capital (Brodie et al., 2017), entrepreneurial mentoring can be defined as involving "one entrepreneur acting as 'critical friend' or 'guide', helping to oversee the career and development of a less experienced entrepreneur" (Davies & Taylor, 2004). In Brodie et al. (2017)'s case study, the perceived benefits of mentoring for entrepreneurs included improved business knowledge, clearer guidance and goal prioritisation, increased confidence, and access to relevant networks. Sariri (2025) provides further evidence for improved startup performance, finding that each additional hour of mentoring increased a startup's probability of achieving above-median external funding by approximately 3% and improved four-year survival odds by 1%. Interestingly, the study finds that mentors push founders to do less and learn more, specifically pushing them to validate assumptions before execution.

External startup support can also take a more formal approach, such as through an accelerator or advisory boards. An accelerator is a formal, time-limited, program with a cohort of startups, that can offer mentorship, office space and small investments in exchange for equity (Wise & Valliere, 2014; Hallen et al., 2020). Accelerators function as an important network intermediary (Howells, 2006) for startups to connect with funding actors and new customers, but also peer-based mentors from the cohort group (Hathaway, 2016; Kohler, 2016). Accelerators have been found to increase startup performance, particularly increasing funding and development speed (Hallen et al., 2020). Moreover, Yu (2016) suggests that accelerators generate feedback effects, enabling startups to more rapidly validate or discard their business idea (Yu, 2016). Shifting focus to startup advisory boards, these consist of carefully selected industry experts who provide the startup with strategic guidance, mentorship and industry insights, aiming to increase growth and improve founders' decision-making (Lashbrook, 2025). Furthermore, advisory boards can extend the startup's existing network of actors, while also enhancing credibility with external stakeholders, signalling potential, and increasing initial funding chances (McNaughton, 2026). As startups grow and more stakeholders are involved, McNaughton (2026) highlights advisory boards as crucial for resolving conflicts and coordinating between stakeholders.

2.3 Legitimacy

Access to networks and resources does not follow automatically from a venture's existence. Before actors such as investors, incubators, and customers engage with a startup, they must first perceive it as credible and appropriate (De Clercq & Voronov, 2009). New ventures entering an already existing business field lack benefits that established incumbents possess (H. E. Aldrich & Fiol, 1994). In the centre of this disadvantage is their limited ability to interact with players in the field, and establish familiarity and credibility (H. E. Aldrich & Fiol, 1994), which connects with the concept of legitimacy.

Before elaborating on legitimacy, it is necessary to distinguish it from credibility, as

the two are related but not the same. Credibility can be defined as "the fact that someone or something can be believed or trusted" (Cambridge University Press, n.d.). Drawing on Pornpitakpan (2004), credibility is based primarily on expertise and trustworthiness. Expertise can be defined as the extent to which an actor is perceived to make correct claims, while trustworthiness refers to the degree to which an audience perceives the claims as valid (Hovland et al., 1953). In contrast, legitimacy is the perception that the actions of an entity are appropriate within a socially constructed system of norms, values, beliefs, and definitions (Suchman, 1995). These are therefore closely connected: Jahn et al. (2020) show that when judging the legitimacy of an organisation, participants will be partly affected by their beliefs about how credible the organisation is, suggesting that credibility can be one of the ways to appear legitimate.

One of the most recognised effects of legitimacy is ensuring survival, rather than enabling the success of firms (Zimmerman & Zeitz, 2002; De Clercq & Voronov, 2009), since it enables startups to gain important resources for building the venture (Zimmerman & Zeitz, 2002). Additionally, the challenge of building legitimacy is twofold, where ventures must fit into the social formation while simultaneously signalling their technical novelty (De Clercq & Voronov, 2009).

2.3.1 Conceptualising legitimacy

Given legitimacy's role in enabling venture survival, a more precise conceptualisation of it is justified. Suchman (1995) presents three types of legitimacy for organisations. First, *pragmatic legitimacy* describes how audiences determine legitimacy based on the benefits they can receive from the focal organisation and its actions. In this setting, actors support an organisation if they believe that they are better off with the organisation in play, or that the organisation relates to the audience's interests (Tost, 2011). Second, *moral legitimacy* is based on whether or not the organisation is "doing the right thing" and focuses on how social welfare is considered. The evaluation of morality includes not only the actions made by the organisation, but also the internal values they set (Kibler & Kautonen, 2016). Third, *cognitive legitimacy*, in contrast to the two other types, is considered from a passive cognitive perspective rather than from active judgement in terms of interest or evaluation. A high level of cognitive legitimacy suggest that no justification is needed, but instead the organisation or its technology is taken for granted (Tost, 2011). This enables an organisation to avoid judgemental evaluation and questioning (Bitektine, 2011). Tost (2011) argues that these three dimensions are not always mutually exclusive, but can sometimes overlap or be considered together when evaluating legitimacy.

How an organisation pursues these types of legitimacy also depends on the perspective from which it is viewed. Legitimacy can be approached in two ways, through the institutional view and the strategic view (Suchman, 1995). Institutional legitimacy refers to a perspective in which the actor is influenced and pressured by the socially structured environment and must adjust to the culturally formed norms (Suchman, 1995). The organisation has become institutionally legitimate when it is being seen as "appropriate for the social context" (Tost, 2011). However, new firms and their entrepreneurial activities can create opportunities to challenge institutional rules, which can cause the standardised

structure of an industry to change and thus, enable it to grow (H. E. Aldrich & Fiol, 1994). This leads into the second view of legitimacy, namely the strategic, which stems from managerial and purposive actions to create legitimacy (Suchman, 1995). This is further supported by Tornikoski & Newbert (2007) and Zimmerman & Zeitz (2002) arguing that legitimacy can be established through actions rather than relying on the characteristics of the individual or organisation.

The impact of legitimacy is usually focused on the focal organisation, where it is depicted as a *property* or resource of that organisation (Suddaby et al., 2016). Taking a broader perspective, it can also be seen as a *process* of social interaction in the field, or by looking through the eye of the beholder, as a *perception* of judgement or evaluation, and each of the three perspectives should be considered to understand the overall effect of legitimacy (Suddaby et al., 2016). Shepherd et al. (2019) build on Suddaby et al. (2016)'s process perspective and suggest that it can be used to gain deeper understanding of how legitimacy is formalised through various stakeholder interactions with the entrepreneur. These multiple perspectives are sometimes naturally combined in discussions. For example, Fisher et al. (2016) discuss, on one hand, legitimacy in terms of possession and identity pointing towards the property perspective; on the other hand, they take the perceptive view when arguing that the various stakeholders and resource providers central to the field have different values and norms and therefore also different ways of assessing legitimacy. Actors who exist in different contexts (e.g. business professionals and politicians) can even cause values, norms, and rules to change on an institutional level which must be accounted for by the organisation and its approach to establishing legitimacy (Fisher et al., 2017).

2.3.2 Strategies and mechanisms for establishing legitimacy

Having established the types and perspectives through which legitimacy can be understood, the focus turns to the strategies and mechanisms by which organisations may actively construct it. Suchman (1995) presents three main strategies for establishing legitimacy, ranging from least to most strategic: *conformance*, following the rules and social structure of the audience; *selection*, positioning the firm in a favourable environment that supports them; and *manipulation*, changing or departing from social norms and values to develop support tailored to the firm. Adding to this, Zimmerman & Zeitz (2002) propose a fourth strategy, *creation*, which refers to creating a novel social context through norms, values, and rules, that are beneficial for the firm. Conformance and selection are more characterised by the institutional view described in 2.3.1 and are found to be fundamental strategies to gain passive legitimacy among ecosystem actors; however, to actively legitimise the firm, the more strategic actions of creation and manipulation must be utilised (Kansheba et al., 2025). Kansheba et al. (2025) depicted a model capturing the four strategies that a new venture can utilise to gain legitimacy in the eyes of other actors within the local ecosystem, and is found in Figure 2.2. However, Kansheba et al. (2024) found that the venture's strategic legitimising actions extend beyond the immediate ecosystem as well. They argue that information about the venture's perceived legitimacy and trust diffuses through established network relationships and transfers to other actors further away.

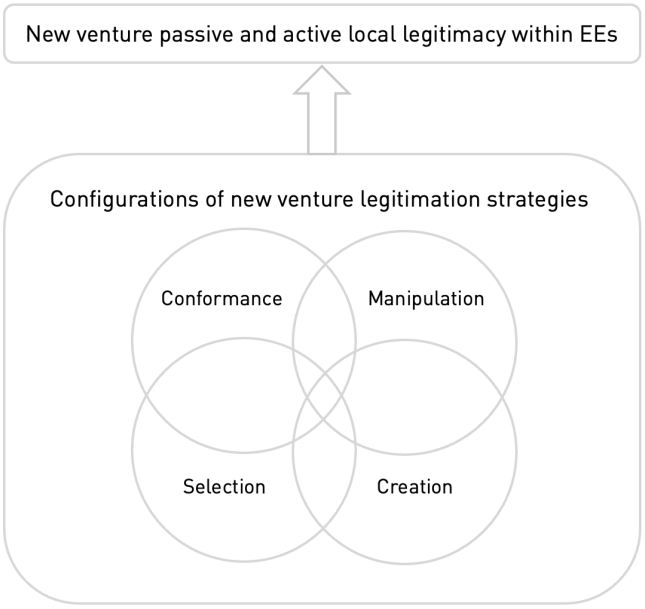

Figure 2.2: Kansheba et al. (2025)'s conceptual model for strategic pathways, forecasting passive and active local legitimacy for new ventures in an entrepreneurial ecosystem.

Mechanisms that can be used in strategies to establish legitimacy include portraying the core identity of the firm, signalling which organisations and individuals the firm is associated with, and showcasing organisational achievement and their leaders (Fisher et al., 2017). Building legitimacy in the eyes of stakeholders is often done through storytelling and setting future expectations, which must constantly be revised to avoid losing, or to regain already lost legitimacy (Garud et al., 2014). Adapting to various stakeholders with differing views on firm legitimation creates a complex environment where different strategies may have to be used on different actors (Fisher et al., 2017). To further approach this challenge Fisher et al. (2017) propose using emphasis framing, which means that a firm should change and adapt their communication to highlight and frame crucial information that best aligns with the identity of the decoder. The decoders are not always external stakeholders but entrepreneurs have also been found to use strategies to convince internal actors within the team, of their individual entrepreneurial capabilities (Middleton, 2013).

With the strategic perspective in mind, creating credibility and familiarity is not always fully in the hands of the focal organisation, but can also depend on other actors in the ecosystem (Ko, 2012). In a similar notion to Kansheba et al. (2024)'s argument about legitimacy spreading beyond the immediate surrounding actors, Li et al. (2024) suggest that there exists a spillover effect of legitimacy, specifically cognitive legitimacy, from established organisations to new firms. In light of this, Stuart et al. (1999) found that actors with a high status can provide an indirect quality signal towards early-stage ventures which they partner with. Additionally, firms can use the attained legitimacy of associated actors for their own benefit (Hermes & Mainela, 2022). Furthermore, established corporations themselves can gain, for example, moral, cognitive, and sociopolitical legitimacy by supporting startups through corporate accelerators (Yitshaki, 2026), showing that legitimacy can be transferred back and forth between both parties involved in a collaboration. Hermes

& Mainela (2022) take a more pragmatic perspective and mean that in turbulent settings, legitimacy can either strengthen networks or weaken them by segregating relationships. An enterprise that violates their legitimate label can cause stakeholders not only to respond negatively to that enterprise, but also to perceive other enterprises in the environment in similar negative ways, resulting in a negative spillover of legitimacy (Ko, 2012).

3
Methodology

This chapter outlines the methodology used in the study. It begins by presenting the research design and justifying why it was the most appropriate to answer the research questions. Next, the empirical selection process and sampling strategy are described, followed by the data collection method and procedures for analysing the findings. Finally, considerations regarding the quality and ethics of the study are discussed.

3.1 Research design

This study adopted a qualitative research method to explore how early-stage MDSs build legitimacy through network development, and how these affect company survival. Understanding this phenomenon requires an understanding of what actors the MDS interacts with, how they interact with them, and what strategies they employ to achieve contact in the first place. Such questions demand attention to individual experiences and the meanings actors ascribe to central concepts, which are difficult to quantify. Hence, these characteristics are closely aligned with the qualitative research methods described by Tisdell et al. (2025).

As part of the qualitative approach, an exploratory interview design was adopted to study the chosen phenomena. Exploration allowed for an in-depth examination, enabling a broader understanding of the critical factors affecting an early-stage MDS (Sreejesh et al., 2014). Furthermore, as Jain (2021) argues, exploratory research is used when the motivations, incentives, and triggers of the persons involved are insufficiently understood, and when generating insights requires direct interactions with the stakeholders. To gather insights, exploratory interviews with relevant stakeholders were conducted, creating a deep understanding of the studied problem (Sreejesh et al., 2014).

Furthermore, the study followed an abductive reasoning approach, which involves moving back-and-forth between theoretical concepts and empirical observations (Bell et al., 2022). This was deemed appropriate for several reasons. Since legitimacy-building and network development in early-stage MDSs remain poorly explored, a deductive approach where hypotheses are tested against empirical data (Bell et al., 2022), would have limited the study. Conversely, an inductive approach would have required the study to generate new theory from empirical findings (Bell et al., 2022), which was beyond the scope of this exploratory study. Abductive reasoning offered a more suitable approach, as existing theory could guide the study, while simultaneously remaining open to change based on empirical findings (Alvesson & Sköldberg, 2026). This logic aligned well with the exploratory research design, as both offer flexibility and understanding to develop throughout the process (Bell

et al., 2022).

3.2 Study origin

The idea for this study originated from Skaaltec AG, a medical device startup and university spin-off based in Zurich, Switzerland, founded by two neuroscientists building on their work at ETH Zurich. The company is developing SmartVNS, a novel neurorehabilitation device designed to improve recovery outcomes for stroke patients, with a current focus on upper limb motion. At the time of this study, Skaaltec had not yet brought its product to market, and was simultaneously advancing its technology, conducting clinical trials for regulatory approval, and seeking investment and collaboration partners.

This stage of their journey prompted the question of how medical device startups can survive in the medtech market. Given Skaaltec's current and upcoming challenges, understanding how such obstacles are approached appeared both timely and relevant. The central phenomenon under investigation therefore concerns how medtech startups survive, examined through the lenses of networks, legitimacy, and entrepreneurship. By studying companies at a more advanced stage than Skaaltec, along with key supporting actors and industry experts, the study aimed to generate first-hand insights into this phenomenon.

3.3 Data collection

Data was collected through semi-structured interviews with MDS founders, innovation and support organisations, mentors, experts, and investors. The semi-structured approach involves developing a series of questions, acting as a general guide for the interviewer (Bell et al., 2022). The interviewer is given the opportunity to ask follow-ups based on the general questions stated in the interview guide, providing flexibility (Tisdell et al., 2025).

An initial interview guide was created based on the identified topics central to legitimacy, network development and entrepreneurial capabilities. As multiple different stakeholders were included in the study, the interview guide was tailored to the respective actor categories while still covering similar topics in all categories. As the first interviews were conducted, the interview guide slightly changed with regards to relevant and irrelevant topics discussed during the interviews. This is consistent with the abductive approach described above, where empirical observations guided the direction of the study. The interview guides can be found in appendix A.

Due to the scarce pool of relevant stakeholders, the authors had to remain flexible to setup interviews facilitating different time zones and geographical locations. Therefore, the majority of the interviews were conducted through online video-calls and two of them face-to-face. Each interview session began by the authors presenting the research topic and describing the main objectives of the study. After asking for consent, interviews were recorded to ensure accurate data analysis following the sessions. Interviews were conducted until data saturation was reached, defined as the point at which additional interviews stopped generating new insights (Guest et al., 2006). This ensured that each topic

could be covered sufficiently from multiple perspectives.

To identify suitable interviewees, both purposive sampling and snowball sampling was employed. In quantitative research, purposive sampling would be a core violation of selecting based on the dependent variable, but in qualitative research it is essential to be able to focus on relevant participants (Mello, 2021). Due to a limited amount of relevant company and industry actors, snowball sampling was also employed. This form of convenience sampling begins with first identifying a small number of participants who clearly meet the study criteria (Tisdell et al., 2025). These participants are then asked to propose other candidates who have similar relevant backgrounds. This approach is especially useful for accessing groups that are difficult to reach (Bell et al., 2022), making it highly relevant for this study. However, the majority of the interviewees were identified without referrals through ordinary purposive sampling.

3.4 Selection of interviewees

To ensure the empirical data was relevant and sufficient to address the research questions, interviewees were selected across three different categories: founders; innovation and support organisations; and mentors, experts and investors. This allowed the empirical material to reflect multiple perspectives on the same phenomena, ranging from those building companies to those observing, supporting, and evaluating them from the outside. Hence, focus is put on the journey of MDSs, while the study also covers the insights of various external stakeholders that play a key role in the startup field of the industry.

3.4.1 Medical-device company founders

Regarding the founder category specifically, a set of criteria was established to ensure that the empirical data was fully in line with the research questions. Focusing on the founders of medical device startups, companies had to meet the following criteria:

- Medical-device company.
- Invasive or non-invasive device.
- Ambulatory device that does not confine patients to the hospital.
- Having engaged in regulatory processes.
- Initiated market entry, defined as having produced and sold its first product.

While regulatory aspects are not the central focus of this thesis, they play a central part in the medtech industry due to the requirements for selling classified medical products. Limiting the scope to ventures with regulatory experience therefore provided insight into potential key challenges in early stages of venture development. Furthermore, focusing on companies that had reached market entry ensured that the companies studied were mature enough to commercialise their product. This also indicates that the company has an entrepreneurial history through which legitimacy and network development can be studied.

The companies included in the study varied in their stage of development. In terms

of operational age, they ranged from early-stage companies (3–9 years) to more established companies (10–30 years). However, time of existence proved to be a poor indicator of maturity due to the generally long timespans in medtech, causing the industry to be uncertain and varying in nature; some older companies had only recently obtained regulatory approval and launched their product while others were already well established with a proven track record. One of the studied companies sought regulatory approval for new application areas with their platform technology while another had in recent years secured healthcare reimbursement for their device. The differences also cascade to the product areas that the companies target, which include but are not limited to pain management, motor and sensory recovery, and brain modulation.

Geographically, the sample spanned the United States, and Europe, with a focus on the DACH region (Germany, Austria and Switzerland), providing international perspectives on how MDSs establish legitimacy and build their networks across different regulatory and market environments. The founding teams also varied in their composition, with backgrounds spanning e.g. engineering, medicine and business, which allowed a broad range of perspectives on building an MDS and the capabilities it requires.

3.4.2 Support organisations & experts

To complement the founder interviews, innovation and support organisations, mentors and experts with involvement in the medtech ecosystem were selected for interview. Together, these actors represent important parts of an MDS's network when they are establishing legitimacy and accessing resources, making these interviews a valuable complement to the data collection. The interviewees were primarily based in Switzerland and were involved with medtech startups focused mainly on commercialisation within the DACH region and the United States.

One part of the innovation and support organisations included incubators and accelerators specialising in healthtech or medtech. Since MDSs commonly engage with such organisations during their early stages, their perspectives offered direct insights into MDS challenges and what aspects are important for an MDS to establish legitimacy and build a network. Interviews were also conducted with innovation hubs that had close ties to regional hospitals, through which MDSs can access support, clinical environments and data. Additionally, a national medtech association was included, representing an actor that can support medtech companies through network access, lobbying and expertise.

The last group included in the interview study were individual mentors and experts, who varied in their backgrounds and areas of specialisation. Their experience spanned large medtech corporations, innovation organisations, the founding and exit of medtech startups, intellectual property, entrepreneurship, medicine, and academic spinoffs. Together, this group brought perspectives from across the medtech ecosystem and given their close involvement in guiding MDSs, they offered practical insights into how MDSs build legitimacy, capabilities, and networks, which complemented the other actors.

3.4.3 Selection process

In practice, the selection process began by manually screening potential interviewees across all three categories, using resources such as industry reports, medtech startup competitions, incubator networks, event participation lists, and word of mouth. The screening was based on the previously mentioned guidelines for MDS founders, and industry and study relevance for the other two categories. Contact was subsequently made via email and phone, with follow-up reminders sent to secure a sufficient interview amount. After each interview was conducted, the authors asked for recommendations regarding other relevant stakeholders to interview. The full screening and outreach process is illustrated in Figure 3.1.

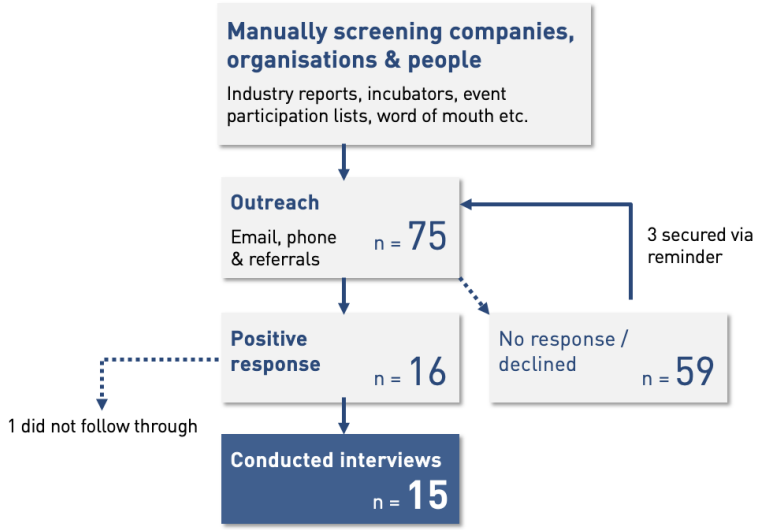

Figure 3.1: Illustrating the interviewee recruitment process, from screening to conducting interviews.

Table 3.1 shows the interviews that were conducted, with each interviewee briefly described, including their *Organisation*, *Role*, *Category*, and *Specific experience*. The *ID* is used to refer to each specific interviewee in the findings and discussion sections. Many of the interviewees have extensive experience and have knowledge on multiple central topics related to the phenomenon studied. These specific knowledge traits allowed the interviewees to provide additional perspectives on certain topics that are not necessarily reflected in their category. As regulatory approval and the clinical trials required to achieve it are often central concerns for MDSs, founding companies with experience in this area were prioritised. Furthermore, another highly relevant perspective is that of investors. As seen in Table 3.1, some of the interviewees are deemed to have investor-specific experience or deeper knowledge.

Table 3.1: (Part I) List of each interviewee described in terms of organisation type, role, and category. ID is based on category with the following abbreviations: F - Founder, SO - Support Organisation, EX - Expert

ID	Organisation	Role	Category	Specific experience
F1	Neurostimulation company	Co-Founder, CEO	Founders	Serial entrepreneur, investor perspective through role as angel investor, regulatory exp.
F2	Neurostimulation company	Co-Founder, CSO	Founders	15+ years as medical doctor, regulatory exp.
F3	Neurostimulation company	Co-Founder, CEO	Founders	Global business experience within medtech, regulatory exp.
F4	Neurostimulation company	Co-Founder, President	Founders	PhD in neurophysiology, regulatory exp.
F5	Neurostimulation company	Co-Founder, CEO	Founders	Economic background, regulatory exp.
F6	Neurostimulation company	Co-Founder, CEO	Founders, anonymous	Electrical & biomedical engineering, research in relevant medtech field, regulatory exp.
F7	Neurostimulation company	Co-Founder, CEO	Founders, anonymous	PhD in neuroengineering, MBA
SO1	Accelerator	Portfolio Manager	Innovation & support organisations	PhD in biomedical engineering, investor perspective through accelerator
SO2	Incubator / Accelerator	Managing Director	Innovation & support organisation	20+ years within medtech sales and marketing

Table 3.1: (Part II) List of each interviewee described in terms of organisation type, role, and category. ID is based on category with the following abbreviations: F - Founder, SO - Support Organisation, EX - Expert

ID	Organisation	Role	Category	Specific experience
SO3	Incubator / Accelerator	Business Advisor	Innovation & support organisation	20+ years of business development, finance, M&A, within large medtech corp.
SO4	Medtech association	Managing Director	Industry & institutional actors	15+ years within medtech, incl. startup
SO5	Hospital Innovation Hub	Head of Innovation	Innovation & support organisation	10+ years in medtech, nursing, business consulting, investor perspective with previous VC role in medtech
SO6	Medtech Investor Club/ Accelerator	CEO	Innovation & support organisation	3+ years head of medtech investor club, investor perspective
EX1	Consultancy	Medtech Expert and Coach	Mentors, experts, investors	30+ years in medtech, startups and large corporations, multiple medtech board member roles, investor perspective through private equity org. and innovation and grant agency
EX2	Innovation Agency	Managing Director, Coach	Mentors, experts, investors	15+ years in medtech, leading roles at entrepreneurial and spin-off support org.

3.5 Data analysis

Following each semi-structured interview, the authors reflected and discussed their own observations to ensure that both had the same understanding of what had been said but also to note contextual factors, such as physical gestures, which is in line with the recommendations from J.Rubin & S.Rubin (2005). Shortly after, an interview summary was crafted based on the interview recording and transcription. All summaries were sent for review to the interviewees, ensuring that the authors had accurately captured the key points of the interviews.

The study later utilised thematic analysis to interpret the findings. This approach involved searching for themes in the data and establishing patterns (Bell et al., 2022). To search for them, Ryan & Bernard (2003) recommend looking for repetition, local expressions, metaphors or analogies, topic transitions, similarities, differences, and such. Given the context of the medical-device industry, topic transitions was of significant importance, particularly since this highlighted stakeholder dependencies that the authors may not have thought of otherwise.

To process the data, the authors performed the thematic analysis outlined by Braun & Clarke (2006) and illustrated in Figure 3.2. The authors began by familiarising themselves with the data, dedicating sessions to reading through transcriptions and interview summaries. Thereafter, an Excel sheet was established with the following columns: Interviewee, Interview category, Quote / Text segment, Initial code, Latent code (underlying meaning) and Theoretical link. Here, each quote / text segment was analysed, generating an initial understanding of what the codes could imply. The initial codes could later be grouped into potential themes. The themes were iteratively developed and refined based on further discussions between the authors, making sure that all relevant findings were considered for the study. This included revisiting all interview summaries, transcriptions and initial codes, to make sure that each theme was mutually exclusive and collectively exhaustive, while also contributing to answering the research questions.

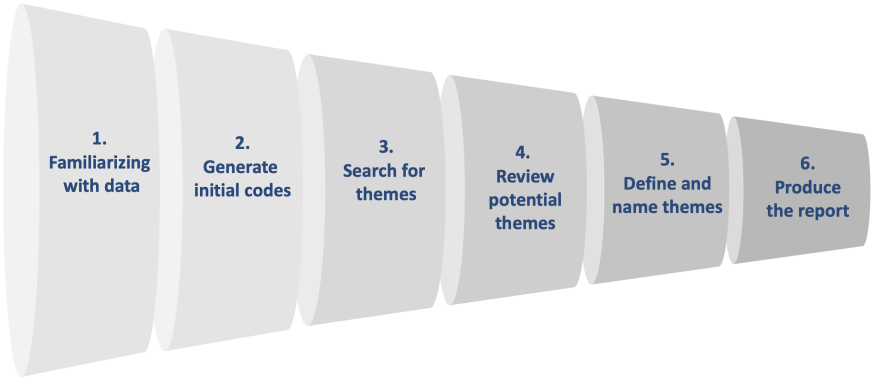

Figure 3.2: Process for analysing the data, based on Braun & Clarke (2006)'s thematic analysis process.

3.6 Research quality

This study adopted a constructionist research philosophy, viewing reality as socially constructed and subjective, progressing through gathering of rich data (Easterby-Smith et al., 2015). In this study's context, the experiences and strategies of MDS founders are viewed as socially situated, aimed to generate deep understanding. To assess research quality within this framing, the study was evaluated on validity, reliability and generalisability (Easterby-Smith et al., 2015). These three are described as follows:

- Generalisability: Is the sample sufficiently diverse to allow findings to be generalised to other contexts?
- Validity: Does the study have a sufficient number of perspectives included?
- Reliability: Will similar observations be reached by other observers?

Regarding generalisability, the study's aim was not for broad generalisation but to generate deep, context-specific insights into MDS development that can create understanding in comparable contexts. Regarding validity, the inclusion of multiple interviewees across different roles and organisations allowed for nuance and variation, yielding perspectives from actors the MDSs closely interacted with, while also bringing the valuable perspective of the founders. Given the exploratory interview study design, combined with numerous stakeholder perspectives, the validity of the study can be argued to be high. Moreover, regarding reliability, Bell et al. (2022) stress the importance of inter-observer consistency. Since both authors attended all interviews, and also discussed their own observations to confirm that both had corresponding understandings of what had been said, it is reasonable to assume that other researchers would have comparable observations.

3.7 Research ethics

To ensure the integrity of this study and the protection of its participants, the authors used Bell et al. (2022)'s ethical principles as guidance, which prioritise informed consent, privacy, avoidance of harm, and preventing deception. Particular care was taken to ensure that the interviewees were not negatively affected by participating.

As previously mentioned in 3.3, all interviewees were fully informed about the study's background, purpose and methodology, prior to starting the interviews. This included explaining that the interviews were the source of data collected. Moreover, it was explained that participation was voluntary and the authors remained attentive during the interviews to ensure that the interviewees felt comfortable with the questions asked. After conducting the interviews, summaries were created and sent for review to interviewees, allowing them to confirm that their perspectives had been interpreted correctly before the data was analysed. Finally, interviewees were offered the choice to be anonymous, and in the end, it was decided to anonymise all interviewees for consistency. The interviewees, their respective organisations and roles have been kept strictly anonymous to all external actors, including the ideation company (Skaaltec). Only the authors of this study have had access to the raw collected data and the identities of the interviewees.

4

Empirical findings & analysis

In the following chapter, the findings of the interviews are presented and analysed. Based on the thematic analysis, four main themes were identified and these represent each section in the chapter. The actual themes are not quoted word-for-word but rather largely reflected in each main heading. In Table 4.1 below, an overview of the themes are presented.

Table 4.1: An overview of the four overarching themes and their respective underlying constructs identified through thematic analysis.

Theme	Underlying constructs
Network embeddedness and value creation	***Building and activating entrepreneurial networks*** Persistent presence, prior connections, adapt to actors, networking
	Value creation through entrepreneurial networks Knowledge, partnerships, academic-clinician consortium
Entrepreneurial capabilities & team formation	***Acquiring and building capabilities*** Diverse knowledge required, business knowledge through "school of hard knocks", outsourcing, self-awareness
	Strategic adaptation & pivoting Business-model pivot, regulatory system change, shifting application area due to stakeholder pressure
	Team formation and governance Non-functioning team, personal conflicts, team restructuring
Establishing legitimacy independently	***The foundations of legitimacy*** Data as basic currency, publications, grant-financed research projects
	Signalling legitimacy through connection and experience Transparency, "grey hair", professional background as mission critical, visibility and brand building
Leveraging external actors for legitimacy and support	**Universities and hospitals** Legitimacy spillover, quality sticker, gate-openers, overcome liability of newness
	Other support actors Participation in accelerator / incubator generates credibility, due diligence, mediating and connecting roles, local partnerships

4.1 Network embeddedness & value creation

A recurring theme across the interviews is that an MDS is strongly shaped by its actor landscape and the relationships that are built between them. Interviews emphasised the importance of having a broad network as an MDS, that ties the venture to key stakeholders and supportive actors. Although cases have been described where these networks are either established around the venture, an individual, or both, the relationships eventually benefit the venture in all cases.

4.1.1 Building and activating entrepreneurial networks

The entrepreneurial networks surrounding MDSs can be built in different ways. Sometimes, the founders of an MDS enter the medtech industry without any previous network, and then have to actively build connections with the surrounding actors (F1). SO3 argues that entrepreneurs must constantly "be around" and seek new connections, both for current and future potentially useful relationships. On the other hand, F2 had already built a personal network through deep previous experience in academia and private and public hospitals, before founding their company. Furthermore, some of the companies interviewed are university spin-offs, which have been shown to affect network building. F6, who's company can be characterised as a spin-off, explained that they had a head start and were able to connect with actors through the university early on.

The multiple actors present in MDS's entrepreneurial networks had differing incentives and roles. The interviews have highlighted stakeholders to which an MDS has to adapt, such as KOLs, and other actors carrying a more supporting role, such as mentors or partners. To sum up, actors that have been mentioned throughout interviews include investors, hospitals, clinics, regulatory bodies, incubators, accelerators, universities, associations, and industry experts. Among these, investors are often paid much attention to, being part of the KOLs, and have been brought up and discussed by most interviewees throughout all interview categories. The medtech industry is described as highly capital intensive (F7) where investors play an important role (SO4). Securing capital through investors represent the main focus of multiple of the interviewed incubators and accelerators. SO2 explains that their primary goal is to make their portfolio companies investor-ready. This includes having a great business case that promotes uniqueness while ensuring that the venture is "coachable, fundable, and scalable". SO6 and their incubator also aim for making the ventures ready for their next investment round, and provide a "platform" for investors (mainly for corporates, not VCs) to find and evaluate the ventures.

Regardless of whether the companies had previous network connections with the mentioned actors, there is a consensus among the interviewees that finding new connections and maintaining relationships are important. One aspect mentioned by several founders (F1, F3, F4, F5, F6, F7) is the importance of being open and present, by continuously attending industry events, such as conferences and pitching competitions. F3 explained how they, out of friendliness, offered a seat at their table at a conference to a clinician, who eventually ended up being the one who led the company's first clinical study. The interviewee further highlighted the importance of the events, arguing that one has to "show up

and magic will happen". According to the interviewees, attending these events should not be done once but rather continuously to make connections. F5 described how they attend around 45 conferences in a year; F6 goes to events all around the world to ensure that they "are everywhere"; F1 emphasises that one needs "an enormous amount of persistence" when having conversations with potential key stakeholders at these conferences. Adding to this, EX1 argues that these events are essential for MDSs to find investors and collaborators.

The interviews reveal that connections MDS founders make do not have a lasting impact instantaneously. F5 suggests that it is through repeated interactions with the same individuals that relationships are actually made to subsequently form the network. The interviewee continues by stating that having a network of experienced individuals that offer guidance and support is "one of my biggest assets". SO2 agrees that this is one of the most important assets in the medtech industry today and in the future, and describes it as "golden" and "unmanageable" by Artificial Intelligence. However, valuable relationships cannot be built based on connections with anyone. One must evaluate their connections and "understand the culture of the people" before forming relationships or collaborations with potential stakeholders to avoid misaligned values and intentions (F2).

4.1.2 Value creation through entrepreneurial networks

As established through the interviews, building and connecting with the entrepreneurial network is crucial for MDSs. The network can provide access to various resources to support the venture journey. One of the main benefits entrepreneurs can get from their network is knowledge. The network can provide knowledge on various aspects, from technical to business-related, which can be valuable for the MDS. SO1 explained how they connect startups with individuals to provide specific expertise in areas such as regulatory strategy, electrical engineering, or practical entrepreneurship. F3 and F5 both mentioned the high value in being able to spontaneously reach out to their network to receive guidance or consultation on certain questions or challenges. Knowledge gains can also come from other ends of the network. F1 describes occasions where competitors or companies that have similar core technology to themselves, but use it in slightly different areas, offer insights based on their own entrepreneurial journey. The network actors can also bestow other types of resources. SO5 explains how they can provide access to clinical environments and infrastructure for startups wanting to test their innovation. Adding to this, F6 mentioned how they got access to similar clinical infrastructure through their network connections.

Creating value through partnerships often goes two ways, and MDSs have to truly understand the different actors in the network. EX1 highlights the importance but difficulty of understanding the pain points and needs of key actors. The interviewee argues that MDSs must develop a deep understanding of hospital workflows and market structures to create a value proposition that fits the customer well. An example of this is SO4's argument that hospitals will only pay for solutions that reduce their internal expenses. This is further emphasised by F6, who argues that the value proposition is "worthless for the medical industry" if it does not include clinical routine and practice.

This is very much related to the concept of joint value creation, which was frequently mentioned during the interviews. F1 explained that in order to receive guidance and knowledge support from external actors, the venture had to share how their business was of interest and value to the supporting actors. F4 and their team shared similar experiences and explained how they utilised grants to fund research projects together with hospitals and industry partners. According to the interview, in general this kind of "academic-clinician-industry consortium with grant financing helps everybody get around together, think, develop new technology, new innovation, and try some new ideas". Through these collaborations, the academics (F4) gained access to facilities for researching their technology, clinics enabled such access, and industry partners could potentially benefit from the commercialisation of new technologies. This incentivised the external actors to collaborate, since they gained value from being associated with a potential successful project, while having none, or very low related costs. SO4 similarly shares that there is a sense of "sharing is caring" among the active members of their association. SO4's members, big and small, with little and much industry experience, are incentivised to share learnings and insights, even with competitors, since that is what the membership is built on. Moreover, SO4 explains that members who do not engage with other members gain nothing from their membership.

Furthermore, interviewees highlight geographical differences in expectations that affect the ability to access the value in the networks. SO1 describes geographical differences in Europe, the U.S., Asia and the Middle East, and gives an example by saying that "Switzerland very much wants to see what you are actually going to do, and the U.S. wants to hear, we are going to the moon". The differences in investor expectations and infrastructure have led to a trend where Swiss startups are pushed to transfer to the U.S. market (EX1). These differences lead to startups having to make strategic decisions about target markets. Some support organisations only accept ventures with an interest and focus on local markets, meaning that prioritising foreign options can cost support from key actors such as incubators (SO6).

In order to tackle these international challenges, F6 focused on building a broad network to enable partnerships with local actors in different markets. This created international flexibility and allowed them to carry out local clinical trials and establish a presence in new markets through partnerships and distributors, thus managing multiple interests through external partners. F6 further explained that networking activities varied depending on the market maturity and the firm's local presence. In newer markets, conferences and industry events were primarily used to build visibility, credibility and relationships with KOLs and potential partners, whereas in established markets it was more transactional and sales driven. Another method to help overcome geographical differences was to participate in specific networking programs, such as the Venture Leaders program for Swiss entrepreneurs (F4, SO1). This program is hosted by an entrepreneurial support organisation and focuses on networking and pitch training in the U.S., which, according to SO1, bridges the gap for funding processes between the regions. F4, who is an alumni of the program, argued that it gave them exposure to investment opportunities and allowed them to establish a business presence in that market. F6 further explained that networking activities varied depending on the maturity of the market and the firm's local presence. In newer markets, conferences and industry events were primarily used to build visibility,

credibility, and relationships with KOLs and potential partners, while in markets they were already established, involved more transactional and sales-oriented interactions.

4.2 Entrepreneurial capabilities & team formation

Establishing an MDS has been found to include plenty of challenges, both industry specific and more general. Some of these relate to regulatory aspects, while others regard clinical validation and establishing a trusting network. The interviews highlight that many of these challenges rely on the startup's internal capabilities, how well they manage to adapt to the market's needs and requirements, and how the team is formed and governed throughout the journey.

4.2.1 Acquiring and building capabilities

In majority of cases, an MDS is based on scientific research. From this research stems a technology that has the potential to impact a medical area. This origin leads to the founding team often consisting of technically and research-skilled individuals. The interviews have highlighted the importance of not possessing expertise in just a single area, but rather having the expertise to navigate the various industry-specific hurdles while having the entrepreneurial capabilities to run the business. SO1 and SO4 highlight that founding MDS teams are very often comprised of engineers or scientists developing their own novel product. This is reflected in the founder interviews, where the companies of F4 and F6 were founded only by pure scientists and engineers. The rest of the founding teams were either composed of a mix of scientific, engineering and business-oriented profiles, or included founders with prior exposure to business or entrepreneurial activities. Regardless of the founding teams' initial capabilities and areas of expertise, there was a consensus that a diverse set of knowledge is required to succeed with an MDS.

As previously mentioned and seen in the interviews, the medtech industry requires engagement in several different areas, including product development, clinical trials, regulatory applications, and reimbursement models. Early on, the founding entrepreneurs must handle several tasks on their own (SO6) and having less of an organisational structure in a small team can initially be the startup's greatest advantage (SO4). However, this strategy cannot be adopted forever, where the venture eventually needs a formal organisational structure with set roles in functional areas (SO4, SO6), otherwise "it will be your biggest disadvantage" (SO6). Similar opinions have been explicitly echoed by several founders (F2, F4, F5, F6, F7). F6 describes how the initial team completely lacked both entrepreneurial and business-related experience, and therefore made an effort to continuously learn new skills and hire new people to build required capabilities internally. F7 shares a similar experience of the importance of learning throughout the journey as a first-time founder. The founding process is described by F1 as "the school of hard knocks", where making mistakes initiates valuable learnings. A concrete example for acquiring entrepreneurial literacy is described by F4 who's participation in startup competitions was instrumental to gain understanding of business figures as a scientist. These events also helped the team learn to tell business stories and strengthen their business case when meeting with KOLs,

including investors. To truly embrace this and improve the business case further, EX2 suggests that founders should actively seek "honest feedback" from VCs and industry partners.

Capabilities to handle all different tasks and challenges that an MDS needs to consider should not always be internalised. F3 mentions how they outsourced non-core functions, including manufacturing and laboratory infrastructure through partnerships, while keeping central competencies such as quality, regulatory, and clinical study expertise in-house. This decision aligns with the interviewee's business strategy of constantly finding the current biggest risks and finding ways to mitigate them. Similarly to this, F6 engaged external engineers for product development to avoid the overhead of a large engineering team. In addition, the interviewee used external partners in other countries to conduct clinical trials and distribution negotiations, meaning that they outsourced actions to enable international expansion.

The aspect of entrepreneurial capabilities has also been discussed on an individual level by the interviewees. Interviews in all categories have touched on the importance of certain individual characteristics for MDS entrepreneurs. SO3 and EX2 emphasise emphasise knowing your weaknesses as a key quality of an entrepreneur, to know what you lack to be able to fill those gaps. However, according to SO3, founders sometimes lack self-awareness about their capabilities and believe that they can "do everything". This causes a misalignment between competences and tasks, where individuals who are experts in one area put their effort into a completely different area where they lack expertise (SO3). Similarly, the founders believe that "knowing what you don't know" is a crucial trait a founder needs in the beginning of their startup journey (F1, F7).

Another capability that recurred across the interviews relates to visibility and brand-building. Most founders highlighted participation in industry-relevant events as central to both finding potential new partners and to position their MDS as a credible organisation. SO1 even notes that social interactions by the founder are one of the most critical factors in gaining the trust of lead investors and establishing long-term clinical interest. F6 described being everywhere as vital to spread awareness about the company, both attending events in regions they were present but also other geographical locations where they potentially were looking to establish themselves. Given that their product was not yet finalised, buy-in from doctors proved difficult, yet by maintaining a consistent presence at medical congresses they were able to build trust with KOLs. This year alone, F6 planned on attending fifty such congresses, putting the commitment into perspective. F3 offered another perspective on visibility, noting that sustained visibility contributed to building a brand, which was an important aspect to gain the trust of stakeholders. This effort transformed initial company scepticism into a position where partners began approaching them proactively. However, there seems to be an upper ceiling of how much effort should be put into this, and F4 suggests that there is a necessary point where an entrepreneur must stop and really focus on developing your operation. F5 reasons that the entrepreneur of an MDS must be present in external settings and make new connections in order to make the company grow, while simultaneously solving various challenges related to operations and business internally. This creates a fine line where both sides have to be given attention, and failing to balance it can have a big impact on the MDS. The importance and responsibility of the founder

is further emphasised by F7 who argues that ultimately it highly depends on the person that's guiding the whole company in making it successful.

4.2.2 Strategic adaptation & pivoting

The interviews have provided multiple insights about the ability to adapt to the several actors present in the medtech industry and the uncertainties they bring. F4 explained that the regulatory system removed the possibility of utilising predicate devices for multiple markets, causing them to change their initial plan and instead pursue two parallel clinical trial pathways simultaneously, one in Europe and one in the U.S.. In addition, no existing tools had the specific capabilities required to test the underlying research that formed the basis of the company's founding. Therefore, the founding team had to overcome this obstacle by using an investigational device to demonstrate their vision. F3 explained that the reimbursement system in the U.S. was not favourable for their product, stating that "if a rehab clinic is not making money off this device, they are not going to implement it". This forced them to pivot in their business model and focus on government sales, as well as approaching additional areas of product usage. The very same conclusion was drawn by F2, who described their problem with the U.S. reimbursement system as a financial mismatch between the company's product benefits and insurer incentive. Similarly as for F3, F2 was more successful when turning focus to selling to large aid organisations instead of private insurers.

In addition to institutional obstacles, adaptation and pivoting were also caused by unfavourable market conditions. F2 describe that the company was founded based on a "deeply personal" motivation related to their child's allergy, but the focus quickly shifted into a different use case area. The strategic models that motivated the foundations of the companies have varied. F5 explained that they adopted a "tech-push" method where the technology was first created and then the team went to various different events and conferences to determine in which area they could create a use-case for their technology. EX1 explains that many medtech founders develop a technology and form a startup "thinking everybody in the world will need this" new product. The interviewee sees this as a problematic approach since it does not necessarily exist a problem that fits with the technology. F4 describes a story with the opposite method, meaning that they had found an unmet clinical need based on their research. They then decided to develop a technology and establish a company to realise their vision of a potential scientific solution, illustrating a tech-push.

Adaptations and changes to the company are not only caused by regulatory systems and market conditions, but key stakeholders were also a common inductor for this based on the interviews. For example, F1 experienced the need for pivoting and explained that the founders' original plan was to make an early exit based on their initial research and data. However, this took a longer turn when potential acquirers required further improvement and additional milestones, causing the interviewee to stay and continue developing the company, even to today, around 20 years later. Similar pressure from a key investor led F2 and the team to change the research focus area. The team had unexpectedly found a new use case area for their technology, which was an area the investor was heavily interested

in, therefore pushing the venture towards that path instead.

4.2.3 Team formation and governance

As seen in previous sections, entrepreneurial capabilities have been discussed in the interviews in terms of both individual traits and team competences. The team perspective has been a central topic raised by the interviewees and has been argued to be closely related to the performance of the venture, especially in early stages. In light of this, SO2 believes that team formation is likely the biggest success factor for early venture building, for good and bad. The interviewee continues by explaining that a non-functioning team "is a strong reason" for failure and misalignment in vision. From the perspective of the incubator that SO2 represents, another reason for a weak performing team is a lack of "coachability". The team is then, for example, reluctant to insights and suggestion made by the incubator and not open to make changes in the team formation (SO2, SO3). Similarly, SO6 mentions that the reasons for their portfolio companies to fail are almost exclusively attributed to team-related issues, such as personal conflicts, internal technical gaps, or a lack of shared vision. The interviewee emphasises that the team should "not hesitate to fire [a team member] if it is not working".

This was precisely the case for F6, where the academically-affiliated founding team lacked similar vision and experienced what the interviewee describes as a "multi-layered difficulty" involving business, ownership, and friendship. One of the founders had a majority stake in the company, lacking involvement and unwilling to give off shares. When new investors came in, a prerequisite was that a restructuring would take place. This occurred, and F6 became the new CEO while the other two founders were bought out, which, according to F6, was necessary for the company's survival and subsequent growth. According to the interviewee, it was "nothing specific with the product or with the go-to-market strategy", but rather personal issues within the team that were the cause. Adding to this, EX2 argues that a "mediocre technology" may succeed with a strong team, whereas a "bad team" will likely fail despite possessing "great technology". The interviewee continues by stating that investors can pressure team restructuring and let go of core members if they do not perform. Hence, the team must connect with investors on a personal level, which is highlighted by SO6 who said that an investor told them that "when I consider a startup, cool technology, everything is fine I'm always thinking 'Will I send an email at eleven pm to these guys?', if the answer is no, I don't invest".

Continuing on the findings raised in section 4.2.1, related to the research or technically-heavy origin of founding MDS teams, both SO1 and SO4 warn that a founding professor, researcher, or engineer sometimes cares too much about their research. This can lead to a reluctance to let go of control or too much focus on the product and technicalities. With a comparable thought, EX2 mean that spin-off founders can remain "too scientifically orientated" and exhibit "too little business orientation". SO4 argues that MDS teams must instead balance technical focus with regulatory and business expertise early in the process. This was further illustrated by F3, emphasising that their diverse set of skills related to business, IP and clinical expertise, was a specific strength of their MDS. With clearly defined roles, this prevented members from "stepping on each other's toes" and enabled

all members to focus on the areas they excelled in.

4.3 Establishing legitimacy independently

A central finding across the interviews is that legitimacy is constructed through a combination of clinical evidence, signalling and experience. Legitimacy is seen to be cumulative, context-specific and often the primary currency for accessing various resources.

4.3.1 The foundations of legitimacy

F2 described clinical data as the "basic currency of an investment strategy", noting that investment in rigorous trials was used to both validate the technology and to increase credibility among regulators and potential investors. F1, F3 and F6 echoed this view, with F6 adding that displaying results from large clinical trials was essential for building credibility and trust among physicians. Publishing academic work about the technology was also seen as a way of constructing legitimacy, with F2 publishing scientific publications but also formal textbooks about the science to ensure the therapy was viewed as a legitimate medical advancement. This was also supported by F3, describing years of running studies, publishing results and gathering patient testimonials before external partners began approaching the company proactively, effectively flipping the direction of communication and initial interest. Support organisations and experts shared this view (SO2, SO3, EX1, EX2), with SO4 stating that the generation of clinical data is essential for gaining the trust of stakeholders.

Building on this, scientific and clinical data was also used to enable other legitimacy-establishing mechanisms. Several interviewees mentioned securing letters of intent (LoI) from clinicians and hospitals as an important part to validate the product's necessity but also to build trust with partners (EX1, SO2, SO5). The willingness to issue an LoI was both contingent on commercial viability (SO5) but also on general interest in implementing the product in the clinical workflow (EX1). Receiving government grants that had been through rigorous peer-review processes was described as another activity that added external validation (F1, F6). F1 described the process of obtaining government grants as a very extensive process, involving panels of high-level scientists and submissions of clinical data, with a small amount of applications being granted. Additionally, F1 explained that they resubmitted grant applications after receiving feedback and doing additional research, showing a heavily data-driven process for obtaining government grants.

This also opened up new doors, which is illustrated by F4: having received external grants they approached hospitals to finance collaborative research projects, building a consortium of academic, clinical and industrial actors. This allowed them to progress without relying on private capital while simultaneously expanding their network and gathering clinical data. F4 noted that clinicians are generally willing to collaborate if the technology offers a suitable solution for their patients and when the partnership is supported by external funding, a win-win situation that allowed the MDS to grow its network and build legitimacy with a minimal footprint.

Several interviewees also mentioned that as a new venture entering the medtech industry, there were certain initial aspects that set the lowest bar of legitimacy. F3 describe these as "checkboxes" that were required to be fulfilled in order to connect with stakeholders. The interviewee explains that this is especially prominent when interacting with investors, who require the MDS to, among other things, file for patents as their IP strategy. According to F3, MDSs "can't stray from the course", otherwise the stakeholders will disregard them instantly. F1 adds to the aspect of IP and claims that having "some reasonable patent" is often enough from a security perspective, but that it is a strong "clinical moat" based on data that differentiates an MDS from competitors. EX1 is on a similar track and explains that an MDS needs what the interviewee refers to as the "holy trinity", which includes IP, a clear regulatory plan, and a path to reimbursement. Early on, startups are also required to find doctors, hospitals and other KOLs who in written form can express their interest and excitement about the product, which functions as the LoIs previously mentioned. SO6 shares the thoughts on the holy trinity and demonstrate how investors will initially ask for two things: the first being whether the MDS has any IP and what the ownership of that looks like; and the second being if they have a strategy for reaching reimbursement and not relying on the patient to pay for their product. Similarly as to F3's notion, SO6 claim that investors will simply not be interested if these two factors are not in place.

4.3.2 Signalling legitimacy through connection and experience

Beyond hard clinical and scientific evidence, interviewees described another set of "softer" legitimacy signals, involving affiliation, background, transparency and visibility strategies, that increased legitimacy in the eyes of stakeholders. For inexperienced founder teams, EX1 and F4 both viewed recruitment of experienced executives as fundamental, with it being almost the only way to establish legitimacy while overcoming the operational expertise gap. EX1 described the necessity of incorporating "grey hair" through experienced co-founders or advisors, while F4 noted that even when delivering the same pitch and data themselves, the presence of these experienced individuals shifted investors' attitudes from rejection to commitment. Support organisations backed this position, where SO4 characterised the presence of former successful founders as a primary driver of credibility, and SO3 encouraged companies to establish strong advisory boards. Furthermore, even though EX2 specifically viewed the inclusion of individuals with extensive corporate experience as valuable, both EX2 and SO1 suggest that such individuals are better suited for advisory roles than co-founder positions due to the differing dynamics between large corporates and startups.

From the perspective of an experienced founder, F3 explained that their professional background was "mission critical" to establish credibility with both future employees and investors. F3 had a background spanning more than twenty years of involvement in management positions at medical companies and explained that by deeply believing in the business idea, combined with his previous background, created trust. Standing behind the business idea to build credibility was also echoed by F2, who had an extensive background as medical doctor, hospital division head, and president of a research society.

Being self-aware, open and transparent were also raised as ways of establishing credi-

bility and trust with stakeholders (F1, F3, EX2). F1 and F3 described being open, honest and transparent about what you know and what you don't know, as the main ways of building credibility as an MDS. F1 stressed the importance of this both regarding scientific aspects but also regarding the business model, clearly explaining assumptions and strategic decisions to make investors understand their position and logic. F3 shared this view, but additionally strived to portray the MDS as an honest and sincere company by sharing challenges, lessons learnt, and pivots through their own media channels. However, according to EX2, establishing trust through this kind of transparency is not done overnight, but rather improves by following a longitudinal journey where fulfilling promises and meeting milestones are paramount.

4.4 Leveraging external actors for legitimacy and support

The previous sections described findings on how MDSs have developed their venture independently, but the interviews also show multiple examples of close engagement with various different actors. A recurring insight from the interviews is that surrounding stakeholders are not merely passive actors, but rather have a direct impact on the focal startup itself. The impact can include various types of support but has also been found to make network and legitimacy transfer from external actors such as universities, hospitals, and incubators, to the MDS.

4.4.1 Universities and hospitals

An MDS can take many actions themselves to improve their business, establish a network, and become legitimate. However, the findings indicate that some of the supporting actors surrounding the startup can have a substantial impact on these factors, and sequentially the survival of the venture.

The supporting actors affecting MDSs include universities and hospitals, among others. Being affiliated with a university or hospital has been found to have several spillover impacts. F6's university ties opened up several leads for valuable network connections. F4 explained how their connection to a highly prestigious and credited university provided a "quality sticker" for the venture. SO1 and EX2 share these opinions and argue that being a spin-off from or being associated with highly credited universities can provide advantageous reputation and connections to stakeholders. Both interviewees agree that the large professional networks of individual professors can be utilised as "gate-openers" to stakeholders and investors. The relationship between founders and universities is characterised as a "win-win" scenario if patent licencing agreements and similar can be kept mutually accepted (EX2).

F5 describes how they built credibility by focusing on convincing researchers and physicians from top-tier institutions like Harvard or a Boston Hospital, which then helped the venture become more credible. The interviewee highlighted the importance of having local connections, which help overcome the liability of newness and provide credibility by referring to these partners. Relying solely on a connection with a recognised Swiss

university would not be sufficient, since the U.S. market actors did not care about foreign organisations.

4.4.2 Other supporting actors

Spillover support can also derive from connections with various other actors. Included in this are the accelerators and incubators who themselves argue for their importance and impact for MDSs. SO2 argues that being a portfolio company of an incubator like themselves provides direct legitimacy for the venture. The interviewee explains that their interest in the venture shows that the incubator believes that the team and the business have potential. With similar reasons, SO6 suggests that startups gain trustworthiness in the eyes of stakeholders purely by being one of the incubator's portfolio companies. As part of their application and induction process, the incubator performs certain due diligence on the startups, which ensures legitimacy to external stakeholders according to the interviewee.

In addition, the supporting organizations emphasise their roles in acting as a mediator and providing connections in the industry. SO1 describes how their incubator possesses valuable connections and the ability of being quick in actions, which supports the portfolio companies, which lack these abilities. SO3 discusses their incubator's important role in their region and argues that a domestic MDS should get in contact with them in order to receive the "best help". The incubator can contribute through a unique innovation system connecting them, academia, the healthcare sector, industry, and investors (SO2). Similarly, both SO5 and EX2 explain how their organisations focus on bridging different actors with each other and with startups, both business-wise and geographically. Thus, their goal is to establish closer relationships and grow the interest of medtech innovations in the area. The utilization of supporting organizations' networks is further underscored by SO6 who describes how they stay closely connected with their portfolio companies even after they have finished the incubator program. This allows the incubator to pair the ventures with interesting stakeholders and individuals and provide them with other areas of opportunity that could benefit them. With regulatory demands being in the core of the medtech industry, startups can also receive indirect support from large lobbying actors (SO4). SO4 describes how their association, with the support of their members, can impact the national medtech industry in favour of the companies.

As noted previously, the interviews emphasise that securing funding through investor relations is a key interest and often a gatekeeper for further steps for startups in the medtech industry. However, the interviews clarify the challenges with convincing investors. Two common themes that occurred in several interviews were investors' lack of industry knowledge and differing expectations. EX1 explains that some Swiss investors are not knowledgeable enough in the medtech industry and "only invest in things they understand", which is problematic when handling technically complex innovations. EX1 and SO5 presents another complexity, which is that VC funding is not adapted to the medtech market due to the time span expectations from investors being too short for an MDS to develop their technology and break even financially. F7 agrees with these challenges and suggests that relations should only be built with investors who understand the "medtech

landscape" and its capital-intensive nature. Moreover, F7 emphasises that investor relationships are built on more than just capital and that investors are "effectively part of your team". Therefore, investor relationships need to be built on trust and transparency.

Moreover, mentoring was highlighted as a way for MDS founders to develop and learn. F6 describes different individuals that have been important for the interviewee's decision-making throughout their MDS journey. These include decisions regarding development plans, taking next steps and similar. The mentors have changed over time and included consultants, network connections and investors. The support was sometimes spontaneous, and occurred through unplanned interactions. Mentoring was further viewed by F3 as a way to navigate business challenges. F3 approached it by going through their phone to consult a network of former colleagues. One of his primary mentors, a former CEO, provided their MDS with guidance and later also became an investor in the company. Similar to F3 and F6, F1 never had one single mentor throughout their MDS journey. Instead, F1 found that people in the field were generally open and helpful. On one hand, investors or experienced individuals from large companies were interested in providing help with certain expertise, as long as there were some joint value-creation for both parties. On the other hand, even competitors or similar startups could be supportive and provide insights based on their own startup journey experiences.

5
Discussion

In the following chapter, the empirical findings are discussed and contextualised in relation to existing literature. The discussion is structured around the four overarching themes, examining their empirical contributions and theoretical foundations, followed by a final section synthesising the overall insights.

Table 5.1: Overview of discussion themes, empirical contributions, and theoretical foundations.

Discussion theme	Empirical contributions & theoretical foundations
Network embeddedness and value creation	***Building network position from outsider to insider*** Persistent presence required; circular reputation-relationship dependency is the core early challenge.
	Reciprocal value creation Value creation requires converting assets into mutual benefits; misalignments stem from absent shared norms.
	Geographic boundaries and international network strategies Domestic legitimacy does not transfer across markets; local partnerships are required to bridge boundaries.
Entrepreneurial capabilities & team formation	***Capability development in a technical founding context*** Technical teams must acquire business capabilities; founder self-awareness is a critical meta-capability.
	Strategic adaptation in a dynamic environment Regulatory and stakeholder pressures force pivots; requires navigating technology push vs. market pull dynamics.
	Team formation as a governance and resource challenge Team conflicts are a primary cause of early failure; restructuring is a recurring, investor-driven process.
Establishing legitimacy independently	***Structural indicators of legitimacy*** Clinical data serves as primary currency; startups must balance novelty with regulatory conformity.
	Legitimacy through people, presence and transparency KOL endorsements and professional backgrounds convert individual credibility into organizational legitimacy.
Leveraging external actors for legitimacy and support	***Universities and hospitals*** University and hospital ties reduce the burden of proof; legitimacy spillover is geographically bounded.
	Other support actors Intermediaries certify organisational legitimacy via due diligence and actively bridge resource gaps.
Connecting networks, capabilities, and legitimacy	**Connecting networks, capabilities, and legitimacy** Synthesis of discussion

5.1 Network embeddedness and value creation

The findings reveal that network embeddedness is not a static asset but rather a dynamic one achieved through a process of continuously making connections and is something that MDSs must actively earn, maintain and strategically navigate. While existing theory captures the structural value of network ties, the interviews add important nuance related to the ability to build a network. This often starts with creating weak connections which strengthens over time through repeated interactions and presence. However, these connections require a joint flow of value to transform into beneficial relationships or partnerships, which also differ between stakeholders over different geographical areas.

5.1.1 Building network position from outsider to insider

Previous research highlights the difficulty and various network challenges connected to entering a market as a new venture and refers to concepts such as "liability of newness" (Stinchcombe, 2000) and "liability of outsidership" (Johanson & Vahlne, 2009). These phenomena often create a negative loop where reputation is attained through prior relationships, while establishing such valuable connections requires a certain reputation. To overcome these obstacles, one must first understand the structure of the system around it, which actors are present, how they interact (Schweizer, 2012), and what their workflows and needs look like (F6). The findings highlight multiple different actors in the system, and one group of nodes that stands out is investors. To connect with them and other KOLs, it is not enough to understand them and their interactions, but to also adjust to their environment and thinking. F4 describes the need to adapt, speak the same business language as investors, and explain their case through telling business stories, to gain the investors' trust and connect with them. Storytelling has been discussed by previous research in the context of legitimacy (Garud et al., 2014), but when considering the circular dependency between creating relationships and trust and reputation, it is not unreasonable to assume storytelling is a valuable tool for network establishment as well.

The starting point from which a new venture begins to create their network varies and seems to be heavily connected to social capital. The findings show that some founders had to build up their network from scratch, while others got a head start through for example their university connections or deep personal embeddedness in the industry. Initial connections through the university allowed one founder to, among other things, easily use clinical infrastructure. This clearly reflects the role of structural SC (Crowley & Barlow, 2022) where some founders were able to utilise pre-existing connections to gain access to crucial resources (Nahapiet & Ghoshal, 2009). Connections with actors have to be cared for though, and a founder must be certain that the culture, values, and intentions of external actors are aligned with the venture, in order to form valuable relationships. This points to Lee & Jones (2008)'s argument that cognitive SC cultivates relational SC, which then strengthens the relational ties between the actors.

Continuing on strength, the theory emphasises strong and weak relationship ties as a way to characterise connections between actors (Granovetter, 1973). The findings seem to focus largely on the weak ties as an effective way to compose and grow the network. F5

attends around 45 conferences and events every year to connect with people; F6 goes to worldwide events to ensure they are present "everywhere" and not just in one place; and F3 told a story of how they, through a random and open act of kindness, met a key stakeholder. All these examples show close signs of Granovetter (1973)'s description of weak ties, such as being distant and having few interactions. The purpose of these weak ties in the findings, and Nozawa & Kang (2025)'s argument about weak ties enabling startups to access resources outside of their immediate network, seem to be alike. In light of this, several interviewees use their network for spontaneous interactions, and another means that an MDS founder must seek connections, if not for current purposes, for the potential of future collaborations. This further points to the bridging aspect of SC presented by Eklinder-Frick et al. (2011), which then naturally indicates that these broad and somewhat loose connections made by MDSs through events and the like, build up the venture's SC in the environment.

Elaborating further on network establishment, the interviewees imply that establishing relationships and building the network is a continuous process that constantly grows alongside the venture. An example of this is the interviewed founders' consensus around the importance of attending conferences and events to create connections. The findings indicate that relationships are actually built through repeated interactions and F1 highlights being persistent in interactions as a key factor in network building. The process perspective of network building aligns with the dynamic nature of networks described by the theory and how this causes startups to adapt their connections based on changes that occur around them (Jack, 2010). Additionally, as the network grows, the value obtained from it seems to grow simultaneously. Having an established network of relevant and experienced actors has been vitally stressed by the interviews, who refer to it as "golden" (SO2) and describe it as one of their "biggest assets" (F5). This implies that as the startup becomes deeper embedded in the network, it transforms weak connecting ties into stronger relationships, and, similarly to Jack & Anderson (2002), can thus access valuable resources.

5.1.2 Reciprocal value creation

The empirical findings show that value creation within MDS networks is consistent with Harrison & Wicks (2013)'s system perspective and value conversion cycle, where multiple actors can benefit from each other simultaneously. Several interviews have illustrated that to create value for themselves, they need to participate with other actors. Value is not created by a single actor (node) alone; instead several actors can be involved and benefit from the value creation. This is particularly apparent in F4's academic-clinician-industry consortium, where grant-funded research projects created a willingness to collaborate. The involved actors could be associated with the project at minimal costs, and if successful, they could individually benefit from it. Clinics provided the facilities where the academics could research their technology; the academics could then test and further enhance their technology, upon which the industry could benefit from a technology commercialisation. However, it is less prominent what kind of resource the industry actors contribute with that motivates the other actors to collaborate with them. Moreover, accelerators explained how they provided startups with expertise and support, while also taking equity in participating ventures. Although accelerators did not explicitly mention how they benefited

from providing these resources, the equity stake suggests that they are dependent on the success of the ventures they support. Additionally, they are prone to have successful startups as the pure nature of the accelerator is to support startups, and since it can likely boost the reputation of the accelerator. This illustrates how value creation can be mutually reinforcing, even when it, at first glance, is not completely obvious.

Furthermore, the findings suggest that MDSs need to carefully position themselves in the network and actively pursue the desired resources. Founders described how they first had to show their value to other actors before receiving the desired guidance and knowledge, while support organisations highlighted that active participation is necessary to benefit from the "sharing is caring" culture embedded within their memberships. This two-way logic aligns with Allee (2009), who argues that actors use their own assets as negotiable outputs, implying that MDSs who fail to communicate the value they bring to the network, are unable to fully unlock the reciprocal value inside of it. Interestingly, two interviews note cases related to coopetition, where competitors collaborate in specific areas. A support organisation notes that members in their association who are competitors share insights and learnings, while a founder explains that they are prone to share learnings with other companies using the same technology. This reflects an open environment where joint value creation is pursued, even with competitors.

The collaborative potential of these networks is, however, not always realisable, seeing as stakeholders have varying objectives. As L. Smith & Woods (2015) explain, actors have different incentives, objectives and expectations, causing disagreements regarding decisions and resource allocation. Support organisations and experts both noted the discrepancies in VC firms' funding timelines and an MDS' development and commercialisation timeline. The time to break-even for an MDS is generally too long for VC firms to invest. Moreover, there is a lack of medtech knowledge in VC firms which can hinder investments, highlighting the importance of cognitive SC, referring to the shared norms, values, goals and interpretations, that enable network coordination (Crowley & Barlow, 2022). The importance of cognitive SC is further reinforced by founders stressing that investors should be carefully selected based on their understanding of the medtech market, and that effective collaboration additionally depends on building relationships grounded in trust and transparency.

The findings also suggest that KOLs have a distinct position within an MDS network, which the existing theory does not fully capture. While the theory treats actors in relatively general terms, the interviews show that certain actors are in a position located in between several key areas for an MDS and therefore have greater importance. These KOLs can sit at the intersection between funding, clinical validation, network access and legitimacy signalling, making them an objective for MDSs to pursue and build relationships with.

5.1.3 Geographic boundaries and international network strategies

Throughout the interviews it has been noted that the value of network ties is geographically bounded. One founder illustrates this by explaining how being tied to a highly recognised

Swiss university can offer value domestically, but is not enough of a signal to build connections in the United States. This was also reflected in the substantial local efforts made in foreign markets, as several founders described how domestic legitimacy and networks alone were insufficient to establish credibility and access abroad. This extends Stuart et al. (1999)'s insights on status signalling. Stuart et al. (1999) explain that ties to high-status partners provides an early-stage firm with indirect quality signals, but the findings suggest that this only holds if a similar audience evaluates the signal. When a signal crosses a geographical boundary, or potentially a cultural boundary, its signal can be interrupted. For MDSs interested in expanding their network internationally, this creates a challenge where the SC generated in the home market does not automatically transfer, which effectively makes the venture, once again, exposed to the liability of outsidership (Johanson & Vahlne, 2009).

One response to this challenge, based on the founders' approaches, is to generate market-specific visibility and credibility, involving connecting with local KOLs and potential partners, rather than attempting to signal from abroad. By creating local partnerships, founders effectively established bridging SC (Eklinder-Frick et al., 2011) internationally, using local actors as a way to access the network. This confirms Johanson & Vahlne (2009)'s understanding that it is impossible to develop the business as an outsider while at the same time aligning with Granovetter (1973)'s idea of weak ties bridging disconnected groups. Furthermore, this approach partly uses legitimacy spillover to access the network. The MDS partners with local actors who can further help the MDS to embed in the network, which is in line with Hermes & Mainela (2022) who argue that firms can use legitimacy of associated actors for their own benefit.

To add a further complexity for an MDS, one interview highlighted differences in investor expectations depending on geographical region. A support organisation contrasts Swiss and U.S. investors, explaining that Swiss investors are more interested in the overall product and execution plan, while U.S. investors often place greater value on ambitious growth targets. This reflects a difference in the cognitive SC, specifically regarding the norms and expectations in both regions. It adds further nuance to investor storytelling brought up in 5.1.1, and implies that MDSs also need to adapt their storytelling based on the geographical region they are targeting. Moreover, an expert explained that U.S. investors are more risk-prone and willing to invest early on compared to Swiss investors, causing Swiss MDSs to shift to the U.S. market. Since key support actors may require a local focus, this has implications for an MDS' network, requiring it to establish itself in a new network of actors, while potentially making the previous network in the domestic market redundant.

To overcome the challenge for an MDS to build a network in a foreign market, interviews highlighted bridging programs such as the Venture Leaders program, located in the U.S. for Swiss entrepreneurs. Through the program, a founder managed to expand their network to the U.S., while at the same time tailoring their business story to U.S. investors. This illustrates measures to obtain bridging SC while simultaneously adapting to the cognitive SC differences in the U.S.. Furthermore, this aligns with Fisher et al. (2017)'s emphasis framing used to establish legitimacy, involving adapting communication to different stakeholders. Overall, formal bridging programs can be a way to establish

presence in foreign markets while also adapting to the different norms and expectations that are specific to these markets.

5.2 Entrepreneurial capabilities and team formation

Building a medtech startup demands more than scientific expertise. It requires a set of capabilities that span technical, entrepreneurial and interpersonal domains, which also changes over time based on needs. The discussion that follows explores how the findings both confirm and extend existing theory on entrepreneurial capabilities, revealing that in the MDS context, the ability to adapt should not only be seen as a competitive advantage but also as a condition for survival. These capabilities are not exclusively about what founders possess and know, but about what they lack, how honestly they assess what they do not know, and whether their team is able to redirect based on this.

5.2.1 Capability development in a technical founding context

According to the theory, entrepreneurial environments are highly dynamic and continuously changes, which means that the capabilities required to succeed with entrepreneurship are highly dependent on the context (Baumol, 1990). In the context of startups in the medtech industry, there is a structural norm of founding teams often being technically oriented, meaning that they have a background in areas related to medicin, science, or engineering. As the findings demonstrate, this is a natural effect of MDSs as they are, more often than not, based on scientific research. However, the interviewees have clearly expressed a need for having capabilities in multiple different areas, showing a connection to De Massis et al. (2018)'s sector-based entrepreneurial capabilities. These imply that entrepreneurial capabilities are required not only within but also across sectors. Applying this on medtech, the interviewees have highlighted that apart from technical skills and general business expertise, MDSs require deep knowledge within industry-specific topics such as regulatory and clinical areas, and reimbursement. As seen in the findings, the founding teams rarely posses knowledge in all these areas, but must instead acquire capabilities externally or develop them internally. Regarding business expertise, which is often a lacking skill due to the generally technically oriented founding teams, founders have both recruited individuals to the team and learned iteratively themselves based on mistakes and obstacles that occurred throughout the startup journey. Regarding other lacking knowledge, such as product development or engineering, the acquisition method varied. Some founders focused on the core functions of the business and decided to outsource non-central and cost demanding competencies, which also functioned as a method to reach broader markets.

An argument could be made that all these strategic actions build upon the concept of dynamic capabilities (Teece et al., 1997). The founders adapted to the environment and the available infrastructure, and utilized external opportunities to acquire expertise in a way that best fit their operations. This closely relates to the selecting and shaping dimensions of entrepreneurial capabilities described by Vu (2020) in terms of coordinating internal and external capabilities in order to make use of opportunities.

Another aspect that recurred in the interviews regarding individual entrepreneurial capabilities was self-awareness. Founders expressed this in terms of "knowing what you don't know" and described it as a crucial trait for founders in early stage MDS journeys. Others similarly mentioned the importance of being aware of your weaknesses and having the ability to overcome these. Lacking self-awareness may in this context cause misalignment between the individual's focus and energy, and their expertise. Founders not being aware of ones own strengths and weaknesses were also found to be problematic for incubators and accelerators. These argue that founders must be open to receive external help and guidance, and sees this as a capability not possessed by every entrepreneur. Being coachable is even perceived as an evaluating mechanism for being part of SO2's incubator. In addition, this can cause further misfire as internal resources are not efficiently allocated, meaning that the selecting and shaping dimensions of entrepreneurial capabilities (Vu, 2020) are not in place. It is reasonable to assume that the consequences of these lacking capabilities are enhanced early on in the MDS journey. This is because teams are usually small with limited expertise, and before it grows, the founders have to do a lot of things on their own. Thus, they would want to utilise their resources as effectively as possible, underscoring the need for entrepreneurial capabilities mentioned in the theory.

5.2.2 Strategic adaptation in a dynamic environment

As mentioned, capabilities are based on specific contexts. As the nature of the medtech industry is highly uncertain with multiple stakeholders and long time periods, entrepreneurial capabilities should also be considered from a dynamic perspective. Teece (2012) brought up dynamic capabilities on an individual level in an entrepreneurial context, and discusses opportunity identification, initiative-taking, and resource allocation. The author focuses on the importance of future opportunities and challenges as opposed to current optimisation. The findings demonstrate several examples of dynamic entrepreneurial capabilities for handling opportunities. For example, one founder initially struggled with the regulatory system but saw an opportunity in using a predicative device, and as a consequence of the structure of the regulatory system, also decided to do two clinical pathways simultaneously. This shows close signs of opportunity sensing, and the efficient utilisation of resources to seise them, which connects with Teece (2012)'s dynamic capabilities. Additionally, other founders were misaligned with the reimbursement system causing them to adapt and find other approaches to sell their products. Another story also described adaptation, but to the stakeholders instead. High investor pressure caused the interviewee to pivot from their initial plan of doing an early exit and instead stayed, helping it grow. The need for dynamic entrepreneurial capabilities thus seems to be high for MDSs, to allow them to adapt to uncertainties and changes initiated by external factors.

Going deeper into the notion of dynamic entrepreneurial capabilities, the findings are divided about Thomas et al. (2020)'s view on capabilities, specifically the technology-market matching and strategic timing. As the findings indicate, most MDSs are based on scientific research. However, the step of transforming this research into a commercialised product through a company can be made for differing reasons. F5 decided to use a push model where they developed a technology and then looked for a problem to solve with it. In contrast, F4 adopted a pull-model, developing their technology and company based on

an unmet need that they identified previously. Hence, different strategies were used to establish a match between technology and market, but both were still successful. This could also be seen from a company-formation timing perspective. In that case, one could argue that F5 mismanaged the timing of when to develop their product, and that F4 on the other hand pursued the company with great timing. Although the push approach contradicts both Thomas et al. (2020) and the general opinion of the findings about a push strategy, the founder managed to overcome this by utilising networking capabilities to eventually find a suitable field for their technology. Therefore, it seems that dynamic entrepreneurial capabilities and networking capabilities are both required for early-stage MDSs to enter a market.

What has been further emphasised in the findings as a critical capability of an MDS founder is related to networking aspects. Multiple interviewees noted the importance of networking and attending conferences, pitching competitions, and various other events, which helps in building awareness and a reputation in the industry and among different actors. However, this creates the challenge of balancing external and internal interests, mentioned in the findings. On one hand, the external focus of the founder is crucial to make connections with KOLs, create a network and, in line with Allee (2009)'s system perspective, make sure the company grows through partnerships and reciprocal value creation. On the other hand, there is a risk of the founder spending too little time actually developing the company internally. Therefore the founder must manage their resources to find ways to balance the pursuit of both paths. A connection can be drawn to Teece (2012)'s and Vu (2020)'s frameworks regarding the aspect of resource handling, but there is a lacking discussion on this internal and external perspective as a capability of the founder. However, this could also be an example of De Massis et al. (2018)'s sector-specific capabilities, meaning that this balancing ability is to some extent uniquely crucial for entrepreneurs in MDSs.

5.2.3 Team formation as a governance and resource challenge

The empirical findings have strongly highlighted the importance of a functioning team for venture survival, but also as a way to appear legitimate. Majority of the times, team formation has been mentioned in a negative context, meaning that new ventures do not think of this aspect until it becomes an issue. Support organisations' have observed that venture failures are almost exclusively attributed to team-related issues. Continuing on this, one founder's experience of a forced team restructuring driven by ownership conflicts, confirms the importance of team composition emphasised by Klotz et al. (2014); Rasmussen et al. (2011); Carland & Carland (2012). The findings show that team formation and governance is not only a peripheral interpersonal challenge, but rather a central challenge for accessing critical venture resources.

That restructuring involved a team sharing an academic background but lacking a shared vision, creating what the founder called a "multi-layered" difficulty involving business, ownership and friendship. When investors entered, they did it under the condition that the team needed to be restructured before committing capital. Two founders were eventually bought out, resulting in F6 assuming the role of CEO. This aligns with experts'

experiences, that investors can pressure team restructuring, and also touches upon several points in the theory. Kollmann et al. (2016) and Khan et al. (2014) both note a higher inclination for conflicts in heterogeneous teams, yet the founder's team was rather homogeneous. At the same time, another founder described their heterogeneous team as functioning effectively due to differing expertise and clearly defined roles that prevented members from "stepping on each other's toes". These findings therefore suggest that conflicts may also occur in homogeneous teams and, although the sample is limited, indicate that interpersonal conflicts are not exclusive to heterogeneous teams. In this sense the findings partially challenge existing literature that associates heterogeneous teams with more conflicts. Conversely, the findings also show that heterogeneous teams can function very well when responsibilities are clearly outlined. Furthermore, they reinforce the importance of addressing dysfunctional teams early, as one interviewee noted that teams should "not hesitate to fire [a team member] if it is not working". Critically, F6's conflict did not only strain the relationships in the venture; instead it directly blocked access to funding, illustrating how interpersonal challenges can constrain resource acquisition.

This further connects to Lazar et al. (2020)'s idea of team composition as an iterative process, where founders need to balance seeking already trusted individuals with people bringing complementary competencies. Furthermore, Lazar et al. (2020) suggest a hybrid strategy balancing similarity and complementarity. In F6's case, they strengthened competencies through investors being added and restructuring, but this came at the cost of losing founding members. Therefore, the founder's experience can be seen to illustrate the consequences of an imbalance in team composition, as well as the potential costs associated with correcting it. Moreover, it highlights a less-discussed dimension in literature where acquiring competencies may require removing parts of the original team, rather than simply adding new members. This also aligns with Rasmussen et al. (2011)'s finding that credibility of university spinoffs is heavily dependent on team composition. Interestingly, in this case, investor credibility was built through the removal of individuals, extending Rasmussen et al. (2011)'s argument. Overall, the findings provide insight into how team composition shapes investor perceptions and consequently venture legitimacy.

5.3 Establishing legitimacy independently

Legitimacy in the medtech industry does not emerge from a single action or milestone, but is accumulated through a layered combination of hard and soft signals such as structural proof, personal credibility, and sustained visibility. The findings suggest that these layers are not interchangeable but requires multiple strategies to be in place in order to create sufficient levels of legitimacy. Hard clinical and scientific evidence sets a necessary foundation, while softer signals around people and presence build upon it.

5.3.1 Structural indicators of legitimacy

The findings expose several different ways of building legitimacy. However, clinical data emerged as the most consistently cited legitimacy mechanism among founders. It was regarded as one of the more tangible ways of evaluating credibility and thus legitimacy. Clinical data from trials and published research such as papers and books, was therefore

seen as a form of "basic currency" for legitimacy. Taking the institutional view of legitimacy (Suchman, 1995), clinical data hence acts as the main norm for determining when actions are socially appropriate in the medtech industry. The interviewees emphasised that building up large amounts of clinical data cannot be done overnight but is rather a time consuming process. However, when done successfully, it can switch the direction of interest and make stakeholders reach out to the MDS rather than the other way around. Conducting clinical trials therefore has a twofold effect. On one hand, it enables testing the technology and research to determine the actual effect it has on patients. On the other hand the result of clinical trials can act as a currency of legitimacy in the eyes of stakeholders. This shows signs of pragmatic legitimacy (Suchman, 1995), where the clinical data is the input used by stakeholders to understand and evaluate the effect of the technology on patients.

Other mechanisms for building legitimacy are found to be LoIs constructed by clinicians and KOLs, and receiving prestigious grants and awards. Taken together, all these foundational types of legitimacy are not independent but rather form a mutually reinforcing cycle where clinical data unlocks grants, grants enable partnerships, and partnerships can generate further data and validation. For F4 this enabled the creation of the previously mentioned consortium of academic, clinical and industrial actors, which is similar to Zimmerman & Zeitz (2002)'s creation strategy. The founder had found a way to utilise grant capital to create an environment where several actors were incentivised to join the collaboration. The external actors did not have to worry about project funding, and the clinicians saw potential in the product helping their patients, meaning they likely also saw the focal venture as pragmatically legitimate, which acted as further motivation for the collaboration.

The findings show additional connections to the institutional aspects of legitimacy, and the norms and values which a new actor has to adapt to (Suchman, 1995). The connections to the findings are based on what can be described as a lower legitimacy threshold, which the founders need to reach in order to even be considered by some stakeholders. The interviewees refer to "check boxes" which founders of MDSs have to fulfil. These generally include: possessing IP rights, often in terms of patents or pending patents; displaying a deliberately constructed business model, preferably a clear path to reimbursement and not relying on the patient to pay for the product or service; and finally having a structured plan to receive regulatory approvals. Hence, founders have to initially adopt a conforming strategy and follow the structure of the system to establish a foundation of legitimacy, but as discussed in 5.3.2, must adopt additional strategies to build further legitimacy.

5.3.2 Legitimacy through people, presence and transparency

While there are structural indicators of legitimacy in the MDS context, the findings also reveal a set of softer legitimacy-building mechanisms. The findings show that these are not substitutes for the structural pieces, but function as complements, particularly in the early stages when hard evidence is scarce, and the venture must find ways to signal credibility.

Having individuals in the MDS with prior industry experience was consistently men-

tioned as a strong credibility signal. Both experts and founders framed the recruitment of experienced executives in inexperienced founder teams as essential for convincing KOLs and in particular investors. One founder explained that when delivering the same pitch and data themselves, the presence of experienced individuals shifted investors' attitudes to the better. This is in line with Pornpitakpan (2004)'s factors affecting credibility, namely expertise and trustworthiness. The experienced individuals accompanying the founder had high levels of credibility that convinced KOLs that the venture in itself was credible and consequently appeared legitimate. Connecting this to Jahn et al. (2020), who show that credibility assessments feed directly into judging legitimacy, the findings suggest that recruiting individuals with established reputations functions as a conversion mechanism: team-level credibility is directly transferred to the MDS level, partly reducing the burden of proof on the MDS itself. In a sector where clinical and scientific expertise carries significant weight, the presence of what an interviewee described as "grey hair" effectively borrowed legitimacy from team individuals before the organisation had earned it independently.

For already experienced founding teams, this dynamic was even more obvious. Such founders argued that their personal track record was "mission critical" for establishing credibility and trust with both employees and investors, reflecting the reputational weight that established professionals have. Moreover, experienced founders emphasised that standing behind the business idea was important to build credibility. The described credibility effect does not likely stem from personally supporting the product alone, but rather in combination with the reputational weight that established professionals bring when publicly endorsing an MDS. In both inexperienced and experienced founder teams, whether borrowed through external recruitment or already existing in the founding team, individual credibility enabled organisational legitimacy. This echoes Stuart et al. (1999)'s argument about how ties to high-status actors provide an indirect quality signal, even though it is here applied on the individual level.

Beyond team composition, visibility strategies emerged as another strategy for accumulating legitimacy over time and building a brand. Founders described sustained participation in medical congresses, industry events and pitching competitions as central to positioning their venture as a trusted actor. This maps onto Suddaby et al. (2016)'s view of legitimacy as a process of social interaction, where sustained participation illustrates how establishing legitimacy is an extended process that does not happen in an instance. Moreover, it aligns with Suchman (1995)'s conformance and selection strategies for constructing legitimacy. Founders participated in industry-relevant events, indicating conformance strategy, while positioning the firm in a favourable environment by actively engaging with selected event participants, indicating a selection strategy. These strategies enabled cognitive legitimacy, where repeated exposure move MDSs towards a taken-for-granted position. However, importantly the findings show that participation prior to the product being finalised can be a way to eventually build trust with KOLs. Seeing as how dependent MDSs can be of external actors for their venture to progress, engaging early can be a way to unlock future milestones. This was particularly obvious for one founder, where clinical trials were enabled by spontaneously meeting a clinician at an industry event.

Transparency was found to be another mechanism through which founders sought to build credibility with external actors. Being open about limitations, assumptions and strategic direction was recurrently mentioned by founders and support organisations. This aligns with high trustworthiness, described by Hovland et al. (1953) as the degree at which an audience perceive certain claims as valid. By showing the more "vulnerable" sides of their MDS and, very importantly, how they are overcome, trust can more easily be obtained for founders. Once again, credibility feeds into the evaluation of legitimacy (Jahn et al., 2020) and strengthens the perceived legitimacy by external actors. Moreover, the findings show that this kind of trust is also developed through time and that it also includes consistently meeting set out milestones and fulfilling promises.

5.4 Leveraging external actors for legitimacy and support

A recurring finding across interviews is that MDSs do not build legitimacy and access resources in isolation. A range of external actors play an important role, including universities, hospitals, incubators, accelerators, mentors and advisory boards. These help shape the venture's legitimacy and its ability to connect to stakeholders. While the previous section examined what MDS founders can do independently to establish legitimacy, this section instead focuses on how surrounding actors can support, and in some cases constrain, the legitimacy and network development of an MDS.

5.4.1 Universities and hospitals

Affiliation with prestigious universities was consistently described as one of the immediate sources of legitimacy for spin-off ventures. Founders affiliated with well-regarded universities described the association as a "quality sticker" that reduced scepticism among investors and clinical partners, while the professional networks of affiliated professors could act as "gate-openers" to actors who where otherwise difficult to reach. This illustrates how MDSs can make use of a legitimacy-spillover effect (Li et al., 2024; Hermes & Mainela, 2022), where affiliation with a high-status institution provides indirect quality signals to external stakeholders Stuart & Sorenson (2007). In the MDS context, affiliation has proven particularly useful, which is most likely attributed to the sector's emphasis on scientific rigour, where if the MDS originates from a prestigious institution, this can imply both technical credibility and access to validated research. From an institutional legitimacy perspective (Suchman, 1995), the university affiliation positions the MDS as appropriate within the socially structured norms of the medtech environment. The medtech environment highly regards the affiliation and therefore values the MDS higher.

What makes university affiliation and access to existing networks a particular advantage in the MDS context is the sequential process of resource acquisition. Investors require clinical data before committing capital; clinicians require some indication of credibility before agreeing to collaborate; and credibility is difficult to establish without either data or affiliation. Therefore, university affiliation can be a way to help break this dependency by providing a legitimacy signal prior to data and established relationships, giving the MDS enough initial credibility to secure the first collaborations that can enable clinical data collection. In this sense the institutional affiliation provides an entry point into the

network that would otherwise be difficult to achieve. However, as discussed in section 5.1.3, these effects have been shown to be geographically bounded, suggesting that it is not applicable in every setting. Nevertheless, this legitimacy-spillover effect is valuable in the early stages when the liability of newness is most acute, the MDS does not have an established track record, and has the fewest developed firm relationships (Stinchcombe, 2000).

The findings further indicate that developing relationships with hospitals can be beneficial for MDSs. Unlike university affiliations where legitimacy is largely inherited from the founding process, hospital relationships must be actively earned. As discussed in section 5.3.1, an MDS must first demonstrate clinical relevance, showing that the technology can contribute to clinical workflows while signalling that the technology is actually possible to develop. This aligns with De Clercq & Voronov (2009)'s reasoning that to build legitimacy a venture must fit into the social formation while at the same time signalling technical novelty. Several founders have described the value of these collaborations as central to obtaining clinical data and LoIs that investors and regulatory bodies require. However, the interviews suggest that these relationships also function as legitimacy signals on their own. A hospital's willingness to collaborate implies that clinicians have performed due diligence and found it credible enough to engage with. This reflects pragmatic legitimacy (Suchman, 1995), where the hospital's decision to partner with an MDS is driven by a reasoning that the venture's technology offers value for patients and clinical practice.

This points to a meaningful distinction between legitimacy spillover and legitimacy that is self-earned. University affiliation is available at founding, requiring minimal prior track record. Hospital collaboration, instead, must be secured through convincing clinicians that the technology is relevant and viable. Together, these two sources of legitimacy can cover different phases in MDS development. University affiliation is most valuable in the earliest stages of development while hospital collaborations can become increasingly important when the MDS is in the process of validating their technology. This suggests that MDSs need to actively indicate progression to reach higher levels of legitimacy, and without progression, this may leave the venture stuck in a position that is insufficient for further resource acquisition.

5.4.2 Other support actors

Incubators and accelerators represented another important source of external legitimacy for MDSs. Support organisations argued that membership itself functions as a credibility signal to other actors, on the basis that proper due diligence has been performed prior to membership access. This can be seen as a strategic approach to legitimacy (Tornikoski & Newbert, 2007; Zimmerman & Zeitz, 2002) where the MDS actively seeks membership, not only for the direct support and coaching that these programs offer, but also to become affiliated with a legitimate actor. Similar to the discussion regarding university affiliation in section 5.4.1, this can be particularly valuable in the early-stages of venture development, though earned through a selection process rather inherited by an institution.

Beyond certifying an MDS, incubators and accelerators can function as network inter-

mediaries in the sense described by Howells (2006), connecting members with investors, clinical partners and other actors that otherwise would have remained far reached. This role illustrates the bridging SC that incubators and accelerators possess, which the MDS otherwise would not be able to accumulate as quickly. Even though no interviewee explicitly mentioned that the connections gained through the programs were more important than the formal program content, the conversations mainly highlighted the connections gained through the programs. This suggests that MDSs may benefit more from the connections made through the programs than the formal content, which is also highlighted in Hallen et al. (2020)'s findings. Furthermore, the bridging role of incubators and accelerators was also found to continue beyond the time of the formal program, suggesting that the extended network the MDS gains access to can remain during future development.

Going deeper into other supporting actors, mentoring and advisory relationships contributed to MDS' legitimacy and capability development in complementary ways. The findings indicate that mentoring MDS founders does not always follow a structured approach. Instead, founders described consulting their existing network for support and that they were given spontaneous guidance throughout their MDS journey. This informal type of mentorship can be seen as very valuable and adds to Sariri (2025)'s more formal mentorship, suggesting that in practice, founders may be more inclined to naturally develop mentor relationships. Mentoring was also seen to develop into more than receiving guidance, as one mentor eventually became an investor, which illustrates how mentoring relationships can develop into greater commitment over time. Furthermore, this provides an example of how actors in the MDS network can assume several roles, which is not as thoroughly discussed in the network literature.

Advisory boards serve a related function to ordinary mentorship. Beyond extending the MDS' network, the findings show that they simultaneously signal to external stakeholders that experienced and credible individuals are supporting the venture, which is in line with McNaughton (2026)'s view. This clearly illustrates the credibility-to-legitimacy conversion discussed in section 5.3.2, where the advisory board can be seen as one collective unit lending their reputational weight which reinforces the MDS' legitimacy.

However, the findings also show that relationships with external actors can sometimes constrain the MDS. Some incubators required their member companies to maintain a domestic market focus as a condition for their membership, limiting the flexibility of the MDS. This, once again, illustrates Harrison & Wicks (2013)'s point that actors have different and sometimes competing interests, which in this case has caused limitations for member MDSs. This tension is worth addressing seeing as it has quite major implications for an MDS' development. The value of external actor relationships is therefore not always unconditional, but dependent on satisfying both actors' interests. This point can become increasingly important as the venture develops, and indicates that MDSs should carefully consider which external actors they engage with.

5.5 Connecting networks, capabilities, and legitimacy

The three themes of networks, entrepreneurial capabilities, and legitimacy, that have been examined across this discussion have largely been treated as distinct phenomena in existing literature. The findings of this study, however, suggest that in the context of early-stage MDS survival, these three dimensions are deeply interdependent. Rather than operating in parallel, all three build on and affect each other in different ways where progression in one of them can either improve or constrain the MDS in the other themes.

The most apparent interdependency identified lies between legitimacy and network access, though the starting point from which an MDS navigates this varies considerably. Some founders entered with pre-existing SC - university affiliations, industry relationships, or prior experience - that provided an early advantage in network access and legitimacy signalling, while others had to build this from the ground up. Regardless of starting point, MDSs face the liability of newness (Stinchcombe, 2000), which in the MDS context creates a circular dependency: accessing vital network actors requires legitimacy, while building legitimacy requires network access. Taking the example of clinical data, it is generally attained in collaboration with clinics or hospitals and often serve as the legitimacy basis on which investor relationships are first built. However, the clinics and hospitals themselves demand a prior credibility signal. Before this dependency can even be engaged, founders must first meet baseline requirements such as IP, a viable business model with a reimbursement pathway, and regulatory approval plans, to satisfy initial stakeholders. The geographical dimension further complicates this interplay. Network connections and established signs of legitimacy do not automatically transfer across markets, which also have differing expectations and institutional systems. MDSs are therefore required to acquire dynamic entrepreneurial capabilities to adapt to the broader system in order to rebuild or transfer legitimacy and network connections.

Entrepreneurial capabilities emerge from the findings as the mechanism through which founders navigate this interdependency. Self-awareness, dynamic adaptation, and the ability to balance internal development with external network-building are found to support both network building and legitimacy establishment. Hence, these capabilities determine not only how effectively a founder builds the venture internally to transform scientific medical findings to products that help patients, but also how effectively they can translate network relationships into legitimacy signals and vice versa. A founder who lacks self-awareness may fail to recruit expertise-bearing team members at the right moment, and a founder without dynamic entrepreneurial capabilities may miss the window in which a weak tie could be converted into a clinical partnership. It is also worth noting that MDS founders can be pressured by actors, such as investors, to acquire new capabilities, restructure the team or pivot towards a different research direction, meaning that development is sometimes imposed externally rather than internally initiated. This aligns with Teece (2012); Vu (2020)'s view of dynamic capabilities as responsive to the environment, but adds to it, suggesting that in highly relationship-dependent contexts such as the MDS sector, the incentive for capability development can come from network actors rather than from broader market signals alone. In this sense, entrepreneurial capabilities function as a connective bond between the network and legitimacy dimensions, while it is shaped by

both the MDS founders and surrounding actors.

The three themes seem to also have individual levels of complexity. Multiple strategies for establishing legitimacy have emerged through the findings where they can be actively sought by the MDS or acquired through external actors. The complex system in which an MDS operates requires multiple strategies to build a high and robust level of legitimacy, which is seen in Kansheba et al. (2025)'s conceptual model depicted in Figure 2.2. Conformance is recurring in the findings as a strategy to formalise a basic legitimacy, while other configurations are used for further legitimation. The importance of using multiple strategies becomes apparent when considering the dynamic nature of the medtech industry and the challenge of geographical differences, since strategies seem to have different effects in different situations. This further highlights the importance of Fisher et al. (2017)'s argument about adapting to stakeholders, not only from a legitimacy point of view, but also in terms of adapting the network relationships and the entrepreneurial capabilities.

Team composition adds another layer to this interdependence. The findings show that team structure is not merely an internal governance matter but a direct factor of how external actors evaluate the venture and its legitimacy. The findings suggest that team heterogeneity carry less importance, as long as roles are clearly defined and a shared vision is in place. As illustrated by a founder's experience, a dysfunctional team did not simply create internal friction but it actively blocked access to capital, demonstrating how team-level failures can damage legitimacy and constrain the venture's ability to build and maintain important relationships. Conversely, the strategic recruitment of experienced individuals can function as a legitimacy conversion mechanism, where individual credibility is transferred to the organisational level (Jahn et al., 2020), and can also accelerate the MDS' network access.

Beyond the team itself, how an MDS positions itself externally plays an important role in connecting all three themes. Sustained participation in external events builds cognitive legitimacy through repeated exposure (Suchman, 1995), while simultaneously expanding the MDS's network through the weak ties formed. Within this broader visibility strategy, KOLs have an important position, sitting at the intersection of network access, legitimacy signalling, clinical validation, and funding. The existing theory does not fully capture this since it tends to treat actors in relatively general terms. A relationship with a single well-positioned KOL can simultaneously support in generating clinical data, attract investor interest, and confer legitimacy spillover. Therefore, certain relationships can play a very important role in the development of an MDS. Beyond KOLs, a range of external actors and affiliations can provide legitimacy signals, network access and capability development that the MDS would not be able to develop at the same speed independently. Certain relationships within the system can hence be defining for the development of an MDS, and acquiring capabilities required to identify, approach, and sustain these relationships is therefore of disproportionate importance for early-stage MDSs.

6
Managerial implications

This chapter confines the study's managerial implications, aiming to be insightful for MDS founders and other supporting industry actors alike. The chapter reflects suggestions on strategic actions which founders in the MDS context should take in relation to the studied subjects.

The findings of this study carry several practical implications for founders and teams of early-stage MDSs. One initial implication of this study is that legitimacy-building should be treated as a deliberate and ongoing strategic activity that builds up over time through actions. A lower threshold of legitimacy is often required to make initial contact and create an interest for key stakeholders, especially investors. The venture should make sure to have established strategies for patents, reimbursement, and regulatory approvals. The findings further show that clinical data, seen as a foundational currency of legitimacy, can take a long time to accumulate and is not alone a sufficient legitimacy strategy in the early stages. Founders should therefore make use of their resources at hand and actively pursue complementary legitimacy signals such as hospital collaborations, receiving LoIs from KOLs, participation in events and programs, and the strategic recruitment of industry- and startup-experienced individuals to the team and advisory boards. These are required to maintain sufficient credibility with stakeholders as robust clinical evidence is built.

Related to this, founders should prioritise building relationships with KOLs early, even before a specific need for collaboration is apparent. The findings consistently show that relationships can function as bridging tools to resources, legitimacy, and opportunities, in the MDS network. Weak ties with individuals built through conferences and events are found to have high potential for being valuable for the MDS, but it often takes time and persistence to transform such connections to partnerships that move the venture forward. Founders are hence required to put efforts into building a reputation and brand, but must carefully balance internal and external focus to not stall the internal development and day-to-day operations of the venture.

Team composition deserves attention far earlier than some founding teams give it. The findings suggest that team dysfunction is the single most common cause of MDS failure, and has also been found to block crucial resources. A lacking team performance can further create negative legitimacy perceptions and hence cause missed relationship opportunities. Founders should address governance mechanisms, establish clear and distinct roles of the founding team, and institute a shared vision around strategic questions. The ability to adapt the venture to external forces and changes does not only imply adapting

the performance and business of the venture, but heavily involves the team formation as well. Founders should thus not hesitate to early on let members of the founding team go if misalignment is apparent. In an opposite notion, founders are also required to expand the team as a call on what capabilities and expertise the venture needs, since a small team cannot carry the venture in the long run.

For founders considering international expansion, the findings suggest that domestic legitimacy and social capital should not be assumed to transfer. Entering a new geographic market effectively means repeating some strategic actions for legitimacy and network building. The founder need to focus on building local weak ties, connecting with specific KOLs which the new market is familiar with, and adapting storytelling and business strategies to local investor norms. Structured bridging programs can offer a practical pathway to accelerate this process and should be considered early in internationalisation planning.

7
Conclusion

This concluding chapter answers the research questions and reflects on how the purpose of the study was fulfilled, before offering suggestions for future research directions within the studied subject area.

7.1 Conclusion

This study set out to explore how early-stage medical device startups build legitimacy through network development, and how these processes shape venture survival. To understand this, two questions were aimed to be answered:

1. *How can founders establish network connections to support the survival of early-stage medical device startups?*
2. *How do founders of medical device startups build legitimacy among key stakeholders during early-venture formation?*

Through qualitative interviews with MDS founders, support organisations, and industry experts, the study has generated several insights into the topic.

Focusing on the first question, the study contributes to the understanding of network embeddedness in the MDS context by showing that the transition from being an outsider to an insider in the network is not a single event but an extended, iterative process driven by persistent weak-tie cultivation, repeated interaction, and strategic visibility. Personal connections are regularly made through industry events, but accelerated expansion of the network often requires affiliation with supporting organisations and individuals. As the network grows, social capital is further increased which in turn, enables the next relationships to be more easily established.

Switching attention to the second question, establishing legitimacy is, similar to network building, a continuous process throughout the startup journey. Multiple mechanisms have been found to increase credibility and trust, such as clinical data to support the product, and a certain threshold of "checkboxes" are generally required by key stakeholders to be fulfilled. Additionally, there are multiple strategic actions to be taken to increase legitimacy, and one of these alone will not allow an MDS to reach a sufficient legitimacy level. Several sources of legitimacy must instead be utilised in combination.

Building networks and legitimacy should not be considered as two separate determi-

nants of MDS survival, but rather as interdependent factors which increase through a cyclical loop. At the core of this lies entrepreneurial capabilities which have been found to be a crucial cogwheel to make this loop go around. Entrepreneurial capabilities often initiate both network and legitimacy development, and in the dynamic environment of the medtech industry these capabilities must be in place to adapt strategies related to networking, legitimacy building, and venture business, in order to survive. One clear finding of this is the ability to balance external visibility and network growth with internal operations. In addition, the study suggests that networking, entrepreneurial capabilities, and legitimacy can be obtained either on an individual or team-based level, or through external supporting actors. Early affiliation with supporting actors can give a head start both in terms of network development and legitimacy, suggesting that not all MDSs start from scratch.

In conclusion, the synthesis of these three themes suggests that venture survival in the MDS context is best understood not through any single dimension but through their coherence over time. Networks, capabilities, and legitimacy are mutually constitutive: each enables and constrains the others, and it is the founder's ability to develop and maintain momentum across all three simultaneously that ultimately determines whether an early-stage MDS survives or not.

7.2 Suggestions for future research

This study focused exclusively on MDSs that had survived. A natural and valuable future research area would be a comparative study between failed and successful MDSs, examining if the network development, legitimacy strategies and capabilities identified here are predictive for venture survival.

Such a comparative design, however, first requires defining what a "successful" MDS is. Succcess in the medtech context is both multidimensional and time-dependent. An MDS may achieve regulatory approval yet fail commercially; it may be acquired before reaching patients; or it may generate great benefits for patients without being financially viable. Future researchers should therefore thoroughly outline the requirements before starting the study, drawing on aspects such as regulatory milestones (e.g. FDA clearance), sustained revenue generation, investor return and patient reach. Seeing as MDSs are naturally in different stages, the requirements need to reflect this, as an early-stage MDS should not be evaluated the same as a mature MDS.

Moreover, as the study found that legitimacy transfer is difficult between geographical regions, founders essentially need to start over if they target new markets. The study does not deep-dive into how founders should approach this, and therefore it could be valuable to get an even deeper understanding for this. Establishing a framework that can guide founders in understanding what actions to perform during certain steps could be useful. Furthermore, it is of interest to learn more about what specific signals can travel better between geographical areas, to understand what signals founders should prioritise.

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Appendix - Interview guide

This section presents an overview of the interview guide that was used during interviews. The guide below shows the structure that was used for the founder group. For the remaining two groups, the questions were adapted to suit their respective perspectives while maintaining the same overall structure. In all interviews, questions were further tailored to each interviewee's personal experiences and background.

Introduction

1. Tell us about yourself, your previous experience in the medtech industry, and your role in the company.
2. Could you briefly describe your company, the past journey and where you are currently?

Networks

1. What actors are surrounding your business and how are they linked to you? (e.g. universities, VC's, hospitals, clinics, mentors, partnerships)
2. Which actors or stakeholders have been most important in your journey so far?
3. Did previous connections or experiences play a role in building your "new" network? (Conferences, accelerators, university contacts, mentors, etc.)

Clinical validation and regulations

1. Could you describe which key actors were involved in the process of testing and validating your technology for regulatory approval, and the roles these actors played? (e.g. testing environments, clinics, hospitals etc.)
2. How did you gain access to clinical testing environments?

Legitimacy

1. Entering a highly regulated and established industry, how did you convince stakeholders that your venture was credible?
2. What aspects were most important for stakeholders?
    - How did these differ between actor groups? (Investors, clinicians, regulators, etc.)
3. Have you noticed any specific ways of acting that have been important for you to build legitimacy during your venture journey?

Capabilities and learning

1. What entrepreneurial capabilities/experiences have been crucial for you when connecting with various actors?

2. What did you lack as an entrepreneur?
3. How did you grow and improve your capabilities as an individual and as a team?
4. Have you received any support, e.g. mentoring, that have helped you become legitimate, grow your network, or improve your business?

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