



The Role of Business Incubation in Shaping Decision-Making Styles of Novice Entrepreneurs:

A Study on Effectuation and Causation

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"The mind adapts and converts to its own purposes the obstacle to our acting. The impediment to action advances action. What stands in the way becomes the way."

MARCUS AURELIUS

Preface

This master's thesis, titled "The Role of Business Incubation in Shaping Decision-Making Styles of Novice Entrepreneurs: A Study on Effectuation and Causation," is written to meet the graduation requirements for the Master of Science in Business Administration, with a specialization in Entrepreneurship, Innovation & Strategy, at the University of Twente (UT) in the Netherlands. This thesis stems from my passion for entrepreneurship, collaborations with two business incubators, and the invaluable guidance from my supervisors.

This journey began in my pre-master's program when a brief mention of effectuation and causation during a lecture sparked my curiosity about the topic. This interest was further sparked by Dr. M.R. Stienstra's call for research on effectuation theory during my master's, which led me to focus my thesis on this research field and asked him to be my supervisor. From seemingly innocent but enthusiastic contact with the incubator Codidact, the link between my research area was quickly established. My background at Saxion University of Applied Sciences and familiarity with De Gasfabriek, the business incubator of Deventer, along with my enthusiasm for Novel T, the incubator at the UT, provided a solid foundation for this study. Dr. I. Skute soon became involved in the project as a supervisor and significantly directed the quality of the research. This project presented a unique opportunity to blend academic research with real-world entrepreneurship. Reading academic articles is not exactly a walk in the park, but my interest in the subject made even the most complex writings an exciting read. I have often thought that I did one of the coolest graduate projects in my field. Learning how entrepreneurs make decisions and what the entrepreneurial journey looks like from an academic and practical perspective fascinated me, and that fascination grew as I got deeper into the project.

I want to express my deepest gratitude to Dr. I. Skute and Dr M.R. Stienstra for supervising this research. Dr. M.R. Stienstra's insights and encouragement played a crucial role in shaping my research. His expertise in effectuation theory laid a solid foundation for this thesis. Dr. I. Skute's expertise enriched my work, offering perspectives that significantly contributed to the depth and quality of my work. Moreover, having him as my professor in both the RSM & ELROD courses was a privilege. I extend my recognition to the entrepreneurs and incubator managers who generously shared their time and insights. Their openness and willingness to contribute to my research have been invaluable. Each respondent shared fascinating stories, from which I learned valuable lessons. I would also like to thank my fellow students who were part of the same master's program. A special note of gratitude goes to Tim Reitsma, whose guidance and insights have been indispensable, both academically and personally, as a friend and fellow student. I extend my heartfelt thanks to my family and girlfriend, especially my sister, Dominique Jamin, for their unwavering support and encouragement. Their belief in me and constant encouragement have been sources of strength and motivation, making this academic journey both possible and fulfilling.

The journey of completing this master's thesis has been both challenging and rewarding as it provided invaluable learning experiences that I will take with me into my professional career. I aspire for this work to contribute to academia and serve as a valuable resource for entrepreneurs, incubators, and students aiming to understand and enhance the entrepreneurial process.

Abstract

Business incubators aim to support startup entrepreneurs with resources, mentoring, and networking opportunities. These organizations provide entrepreneurs with valuable support and guidance during the critical early stages of their startup's development. However, despite the increasing academic interest in both entrepreneurial decision-making and business incubation, we still know very little about how business incubators influence the entrepreneurs they intend to support. Causation and effectuation have emerged as dominant frameworks for understanding how entrepreneurs make decisions. Causation is a linear approach focused on predicting and controlling outcomes, starting with a clear goal, and selecting means to achieve it. In contrast, effectuation is non-predictive, focusing on using existing means to achieve goals that may not have been predefined. This study aims to expand our knowledge of how business incubators influence the entrepreneurial decision-making styles of effectuation and causation, particularly during the early developmental startup phases. Through a qualitative analysis of in-depth semi-structured interviews with entrepreneurs and incubator managers across two incubators, this study explores how novice, inexperienced, entrepreneurs navigate effectuation and causation within the incubation process. This study offers valuable insights into the incubator's tenants, business incubation programs, and their impact on the development of entrepreneurial decision-making styles. Findings reveal a dynamic interplay between effectuation and causation, with entrepreneurs using a hybrid decision-making approach that adapts to their evolving internal and external startup conditions. Inductively identified conditions include perceived environmental uncertainty, financial resources, and stakeholder pressure. Contrary to initial expectations, incubators do not enforce a singular decision-making logic but rather support the adaptive use of both effectuation and causation, tailored to each developmental startup phase. The study contributes to the literature by exploring the role of business incubation on the journey of novice entrepreneurs. The findings provide practical recommendations for incubators, policymakers, investors, and entrepreneurs, highlighting the importance of understanding both decision-making styles and startups' internal and external conditions. These include insights for tailoring incubator support to the specific needs of startups at various stages of development and promising directions for future research.

Keywords: Entrepreneurial Decision-Making, Effectuation, Causation, Startups, Business Incubators

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1. Introduction

In today's business world, characterized by Volatility, Uncertainty, Complexity, and Ambiguity (VUCA), the role of entrepreneurial decision-making has become more important than ever. This turbulent environment presents significant challenges during the critical early startup phases, making it essential for entrepreneurs to possess the skills and knowledge necessary to navigate them successfully (Leung, 2018; Araújo et al., 2021; Ehsani and Osiyevskyy, 2022). Entrepreneurial decision-making, especially in technology-based ventures, is heavily influenced by uncertainty (Atuahene-Gima and Haiyang, 2004; McMullen and Shepherd, 2006; Townsend et al., 2018). Understanding how entrepreneurs can confront this uncertainty is crucial, especially given the high failure rate of startups. (Peters et al., 2004; Chandler et al., 2011).

1.1 Effectuation & causation

Literature on entrepreneurial decision-making makes a distinction between planned and emergent strategies. Prior research on the relationship between business planning and venture performance suggests that business planning positively influences performance (Brinckmann et al., 2010). However, this relationship significantly weakens in younger firms due to uncertainty during the early growth stages. It has been proposed that a planning-based approach is suitable for venture creation in the absence of uncertainty, whereas emergent decision-making becomes crucial when uncertainty is present (Alvarez and Barney, 2005). According to Sarasvathy (2001), expert entrepreneurs address this uncertainty by adopting an emergent 'Effectual' decision-making approach, especially during the challenging and unpredictable early stages of the pre-firm process (Dew et al., 2009a; McVea, 2009). Effectuation does not begin with a fixed goal. Instead, it is characterized by starting with the resources on hand, engaging in partnerships, taking calculated risks, and leveraging contingencies (Roach et al., 2016; Haneberg, 2021; Dew et al., 2009b). Effectuation contrasts with 'Causation', the traditional approach used by managers in established organizations. Entrepreneurs or managers who use causation start with clear goals and value pre-existing knowledge such as market research, conducting competitive analysis, and prioritizing expected returns (Berends et al., 2013). Causation, therefore, focuses on trying to control the future by predicting it. Effectuation challenges this conventional approach of analysis and planning by following a non-predictive logic (Read and Sarasvathy, 2005; Fisher, 2012). In her foundational work on effectuation theory, Sarasvathy (2001) highlighted the relationship between these two logics as she proposed that effectuation and causation "can occur simultaneously, overlapping and intertwining over different contexts of decisions and actions" (p. 245). This study thus considers effectuation and causation as distinct decision-making logics, which can be used simultaneously.

1.2 Context

While startups can benefit from more flexibility than larger corporations, they often lack internal resources such as human, social, and financial capital and face challenges due to their limited organizational and marketing capabilities. They face more challenges than larger, more established firms because of this double liability of being both new and small (Berends et al., 2013; Lukeš and Zouhar, 2016). Business incubators emerged as key players in this context, aiming to improve startups' chances of success. These organizations play a crucial role in the entrepreneurial landscape by compensating for the shortcomings of startups by providing a supportive business environment, especially during the early stages (Hackett and Dilts, 2004). These early stages involve decision-making about opportunity assessment, market-entry, and opportunity exploitation (Shepherd et al., 2014). Therefore, external support is crucial during these early stages, as it can provide a range of benefits including knowledge exchange, resource access, and opportunities (Mattsson et al., 2018). Furthermore, business incubators can help transform innovative ideas into tangible products through prototyping, especially for inexperienced entrepreneurs (Tripathi et al., 2019).

Being housed and engaged within a business incubator could potentially impact the entrepreneurs' decision-making style (Aarstad and Jakobsen, 2019). Research on decision-making styles within the

entrepreneurial process has evolved significantly over time, highlighting the nuanced differences between expert and novice, less experienced, entrepreneurs (Perry et al., 2012). Historically, effectuation theory emerged from research on expert entrepreneurs. This distinction between expert and novice entrepreneurs is crucial, as evidence indicates that expert entrepreneurs tend to use effectuation more than novices. This could imply that decision-making styles can change as entrepreneurs gain experience (Dew et al., 2009a). Prior research has not been able to rule out other explanations that don't revolve around experience (Baron, 2009). While some individuals may naturally possess an effectual mindset, there is evidence to support the idea that effectuation and entrepreneurship are a learnable and teachable set of thinking strategies and behaviors that can be developed through training and practice. According to this perspective, effectuation and entrepreneurship are not innate traits, but rather a set of thinking strategies and behaviors that can be learned over time. (Sarasvathy, 2008; Ranabahu and Barrett, 2019).

1.3 Problem statement

At their core, incubators create an environment in which new startups can thrive. The physical co-location of tenants in business incubators has been found to increase the likelihood of partnerships as proximity affects the frequency of interaction and the formation of networks, central to effectuation (Hansen et al., 2001; Löfsten and Lindelöf, 2001; McAdam et al., 2006). Yet, the path to securing incubation support is nuanced, especially within VUCA environments where unpredictability and complexity make it challenging to evaluate the potential of startups accurately, and early-stage startups struggle to demonstrate tangible proof of their venture's feasibility or viability (Festel et al., 2013; Santisteban et al., 2021). Therefore, incubators tend to, implicitly or explicitly, recruit entrepreneurs taking a causation approach by selecting candidates with a predefined entrepreneurial goal or business plan (Høvig et al., 2017). On top of this, incubator programs may impose causal activities on otherwise effectual entrepreneurs through the incubation process (Brun, 2019). Other, financial, actors in entrepreneurial ecosystems also expect entrepreneurs to follow a more causation-driven approach, at least in terms of presented output - a business plan - (Ghezzi, 2019). This presents a paradox for entrepreneurs who, in seeking the advantages of an incubator's support and resources, might have to lose some autonomy and be nudged towards the more deterministic and less flexible decision-making logic of causation, potentially at the expense of the flexibility and adaptability of effectuation.

1.4 Research gap

Entrepreneurship scholars have distinguished effectual behavior from traditional causal reasoning, aiming to understand its core drivers. However, recently there has been a shift from viewing effectuation and causation as separate approaches to recognizing them as potentially complementary. Given that entrepreneurship is embedded in specific contexts that enable the start of a new venture, effectuation theory must account for how context influences entrepreneurial thoughts and behaviors (Kitching and Rouse, 2020). Although several studies have documented the alternating or simultaneous use of effectuation and causation, deeper underlying explanations for why this might occur often remain unarticulated. As Grégoire and Cherchem (2020) observed in their comprehensive literature review on effectuation theory: "More concerning perhaps is the observation that the mechanisms explaining these phenomena are often assumed or implied, but seldom directly observed or specifically measured. For example, a study may indicate that the involvement of external investors encourages a shift towards causation, but the informational demands and pressures thought to drive such shifts are usually not explored in detail" (p. 628). This gap reduces the validity and theoretical importance of otherwise relevant observations and is linked to calls for better explanations of the conditions and mechanisms that drive entrepreneurs to prefer one decision-making style over another (Arend et al., 2015). While numerous factors influencing entrepreneurial decision-making have been explored, the role of business incubators in this process has received considerably less attention.

Business incubation research suggests a discrepancy between the entrepreneurs' expectations and the services provided by business incubators (Abduh et al., 2007). Despite the increasing attention given to business incubation, our understanding of how these entities affect the entrepreneurs they aim to assist

is still limited. Effectuation theory needs to specify the entrepreneurial landscape by providing a multi-dimensional perspective of the roles and effects of external parties, making the study of business incubators, seen as an external institution, particularly relevant.

Arend et al. (2015) argue that while it is interesting to identify the skills needed for effectuation, it is more valuable to explore how these skills can be acquired. In entrepreneurship education, there is an opportunity to assist novice, inexperienced, entrepreneurs in their journey toward becoming expert entrepreneurs (Krueger, 2007). One strategy is to integrate effectuation principles into their learning journey (Robinson et al., 2016). Nevertheless, there is still a need to further define the mechanisms that enable and hinder novices to become effectual agents over time (Engel et al., 2014; Günzel-Jensen and Robinson, 2017). Entrepreneurs enter these incubators with diverse backgrounds, ambitions, and industry-specific challenges, all of which can influence the extent to which they use causation or effectuation. Moreover, certain causal or effectual features of a business incubator, including its incentives, external financial actors, and other qualitative or quantitative properties of the incubation program, may influence the adoption of certain entrepreneurial decision-making styles. Understanding the interaction of these personal and contextual factors, as well as incubator practices, is essential for developing a nuanced perspective on how incubators promote entrepreneurial growth.

1.5 Research question & design

The purpose of this study is to better understand the role of incubators in either fostering or hindering entrepreneurship. It responds to calls for further development of effectuation theory by empirically exploring relationships between new constructs (Perry et al., 2012; Grégoire and Cherchem, 2020). It explores whether and how participation in a business incubator impacts a novice's use of effectual and/or causal decision-making logic in the early stages of entrepreneurship. It further aims to provide insights into how business incubators can effectively support the development of an expert decision-making style. Therefore, the central research question is:

How do incubated novice entrepreneurs utilize and navigate different decision-making styles (effectuation and causation) throughout the first stages of the entrepreneurial process and how does the incubators' influence support and/or hinder this process?

Through a qualitative research design, this study conducts 11 in-depth semi-structured interviews with 8 entrepreneurs and 3 incubator managers across two different incubators. It explores the evolution of entrepreneurial decision-making styles across the idea, pre-startup, startup, and post-startup phases as defined by Clarysse and Moray (2004), in line with the temporal framework of Reymen et al. (2015). These phases start with the first business idea and end in the post-startup phase, marking the transition from technology development to revenue generation and subsequent growth activities, serving as a major credibility threshold. By exploring the role of business incubation on the decision-making styles of novice entrepreneurs, this research offers valuable insights into the incubator's tenants, business incubation programs, and their impact on the development of entrepreneurial decision-making styles. The findings reveal how and why incubated novice entrepreneurs dynamically switch between effectuation and causation through a hybrid approach based on changing internal and external conditions. This nuanced perspective highlights incubators as supportive entities. Thus, not enforcers of a singular decision-making style but facilitators that support the adaptive use of both logics, aligning with each startup's development phase. This not only advances the theoretical understanding of entrepreneurial decision-making and business incubation but also provides practical implications for policymakers, incubators, investors, and entrepreneurs. The findings especially offer actionable insights for incubators on tailoring their support and programs to better align with the specific needs of startups at various stages of development, as well as insights into how incubators can assist novice entrepreneurs in making effective decisions.

2. Theoretical framework

The second chapter starts with an outline of the academic debate on planned and emergent entrepreneurial decision-making. Then on effectuation and causation theory, with an emphasis on their distinctions and interplay. Furthermore, it examines the characteristics of novice and experienced entrepreneurs. Next, the concept and theory of business incubation are outlined. The chapter concludes by presenting expectations for the outcomes of this study through propositions derived from the insights in this chapter.

2.1 Planned vs. emergent decision-making

Recently, scholars have been increasingly focusing on the role of decision-making within the entrepreneurial process (Sarasvathy, 2001; Baron, 2009; Fisher, 2012). Making decisions and acting in the face of uncertainty is part of new venture creation. On top of that, this uncertainty influences how decisions are made (Sarasvathy, 2001; Alvarez and Barney, 2005; McMullen and Shepherd, 2006; Townsend et al., 2018). For entrepreneurs, uncertainty has special relevance, because as stated by Van Praag (1999, p. 322), "business decisions practically never concern calculable probabilities.". These decisions can include seizing opportunities, managing relationships, and determining whether to continue or exit a business. While some decisions are straightforward, others have a greater impact on the success of the business (Shepherd and Patzelt, 2017). Two main perspectives have emerged in the field of strategy research, which defines strategy as "a pattern in a stream of decisions" (Mintzberg, 1978). The first considers strategy-making as a deliberate planning task, while the second argues that strategies emerge from practice and cannot be fully planned in advance (Mintzberg and Waters, 1985). Mintzberg and Westley (2001) classify these decision-making approaches as rational ('think first') and action-oriented ('doing first').

Scholars from this 'planning school' highlight the crucial role of business planning in ensuring the survival and growth of both new and established ventures. It follows a rational and structured approach to strategy development, heavily relying on predictive methods like market research, competitive analysis, and risk-adjusted return calculations (Dew et al., 2009a; Brinckmann et al., 2010). These deliberate strategies refer to those strategies that are considered successful when the intended plan is fully realized (Mintzberg and Waters, 1985). For a strategy to be flawlessly deliberate, three essential conditions must be met. First, the organization's intentions must be clear and detailed. Second, these intentions must be widely shared by everyone involved. Finally, the collective intentions must be carried out exactly as planned, with no external factors such as market changes, technological advancements, or political influences interfering. Meeting all these conditions is challenging, making it unlikely to find strategies that achieve this level of deliberate perfection.

Emergent strategies, refer to "patterns or consistencies realized despite, or in the absence of, intentions." (Mintzberg and Waters, 1985, P. 257). Entrepreneurs often face uncertainty when making initial decisions, making predictive decision-making techniques largely ineffective (Miller, 2007; Brinckmann et al., 2010; Wiltbank et al., 2006; Smolka et al., 2018). The emergent school highlights the importance of learning, flexibility, and resource control in achieving superior firm performance. To qualify as a perfectly emergent strategy, consistent patterns of action must emerge over time, even without intentional guidance. Inconsistency, on the other hand, indicates either the absence of a strategy or the failure to achieve the intended strategy (Mintzberg and Waters, 1985). It is difficult for action to occur in the absence of intent, at least from some part of the organization, if not from the leadership itself. As a result, purely emergent strategies are just as rare as those that are purely deliberate. We can however anticipate the presence of tendencies toward both deliberate and emergent strategies. Essentially, these strategies represent opposite ends of a spectrum, and real-world strategies are likely to fall somewhere along this continuum (Mintzberg and Waters, 1985).

Known as the 'planned vs. emergent' debate, its discussion explores whether entrepreneurs should

strictly adhere to planning and execute actions with a goal-oriented approach, or if they should instead initiate activities spontaneously and adapt to contingencies as they arise (Brinckmann et al., 2010; Smolka et al., 2018). In contexts characterized by true uncertainty, planning-based approaches seem to have limited effectiveness. Plans based on past predictions may no longer be reliable in such situations, as the unfolding course of events may differ from what was expected (Brinckmann et al., 2010; Chwolka and Raith, 2012; Andries et al., 2013). It has been proposed that a planning-based approach is suitable for venture creation in the absence of uncertainty, whereas collaborative and flexible decision-making becomes crucial when uncertainty is present (Alvarez and Barney, 2005; Sarasvathy, 2001). Ultimately, effectively allocating resources and implementing a suitable decision-making structure can serve as valuable tools for entrepreneurs to navigate uncertainties and capitalize on opportunities (Grégoire and Cherchem, 2020).

2.2 Effectuation and causation

Entrepreneurial decisions thus revolve around the choice of following a structured planning approach, embracing emergence, or a combination of both. Sarasvathy (2008) highlights the importance of using Knight's (1921) framework for dealing with uncertainty. It describes the entrepreneurial problem space consisting of the following three problems:

- Knightian uncertainty: Described by Knight in 1921, this concept refers to situations where it's impossible to calculate the probabilities of future outcomes. It distinguishes between scenarios of risk (with known probabilities, like a coin toss), uncertainty (where the probabilities are unknown but can be estimated through experimenting), and entrepreneurship. In entrepreneurship, outcomes are often so unpredictable that no research or test can predict the results.
- Goal ambiguity: Entrepreneurs often have flexible goals that shift with market dynamics, personal aims, or business challenges. Ambiguous goals can make establishing a clear direction for decision-making and strategy formulation difficult.
- Environmental isotropy: When there is Knightian uncertainty and goal ambiguity, it is more difficult to prioritize and determine what information deserves attention. It recognizes that not all information provided to decision-makers is equally relevant, and it is not always clear which information will be useful in advance.

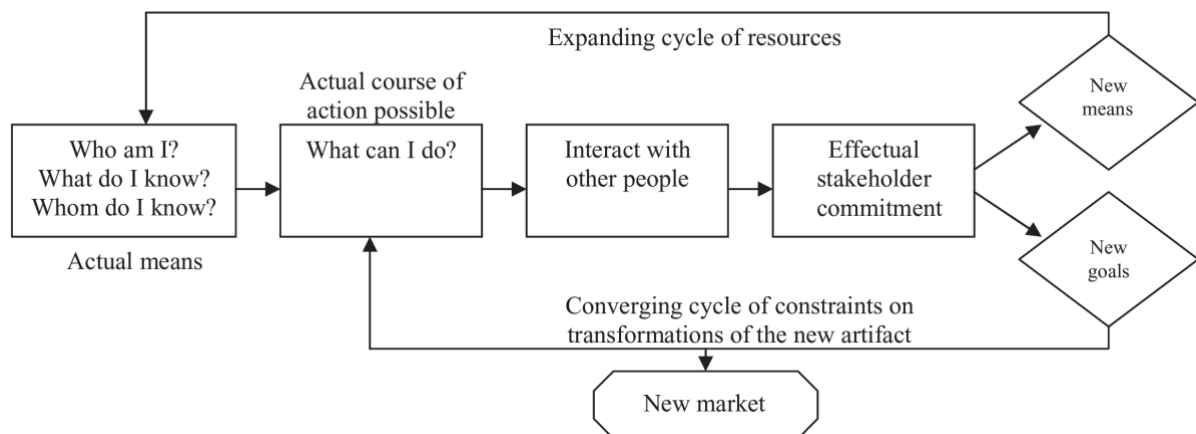
Sarasvathy recommends using effectuation as the preferred entrepreneurial decision-making approach to address these three problems. Effectuation logic focuses on the controllable aspects of an unpredictable future stating: "To the extent that we can control the future, we do not need to predict it" (Sarasvathy 2001, p. 252). It reduces the reliance on predictive data and instead emphasizes the potential for shaping and cocreating both goals and aspects of the external environment over time. Rather than being a problem to be solved, goal ambiguity becomes a valuable resource, and isotropy is solved through commitments from self-selected stakeholders (Sarasvathy, 2008). The effectual process can be best understood through its five principles:

1. Bird in Hand: Effectual entrepreneurs start with their existing means: their identity, knowledge, and networks. They use what is already available rather than what is out of reach.
2. Affordable Loss: Rather than focusing on expected returns, they limit their risk by investing no more than they can afford to lose. It guides decisions based on the potential downside rather than the expected upside.
3. Lemonade: They embrace and leverage surprises and unexpected events as opportunities to create new markets or products, instead of viewing them as setbacks to be avoided through planning and prediction.
4. Crazy Quilt: Rather than targeting specific stakeholders based on a predicted product market, they build partnerships by allowing anyone to self-select into the process. They co-create their businesses by interacting with others, acquiring new resources, and engaging stakeholders who have a stake in the future of the business.
5. Pilot in the Plane: The future is not something to be predicted but shaped by the entrepreneur's co-created actions. They focus on activities within their control and guide the business towards

achievable goals and new resources.

In the journey of new venture creation, entrepreneurs embracing an effectuation approach often begin with the broad aim of establishing a venture. Throughout their journey, they remain adaptive, refining their approach as they learn from each decision and its outcome. This flexibility is crucial due to the unpredictable nature of new markets. By experimenting with various strategies in the marketplace, entrepreneurs gradually discover a viable business model. This process allows them to manage uncertainty effectively and seize new opportunities as they arise (Chandler et al., 2011). Effectuation actively embraces uncertainty and enhances control through co-creative processes that use existing means and collect commitments and resources. This iterative process allows ideas to converge and specific goals to emerge (Sarasvathy and Dew, 2005).

Figure 1 The effectuation process (Sarasvathy & Dew, 2005; Fisher, 2012, p.1025)

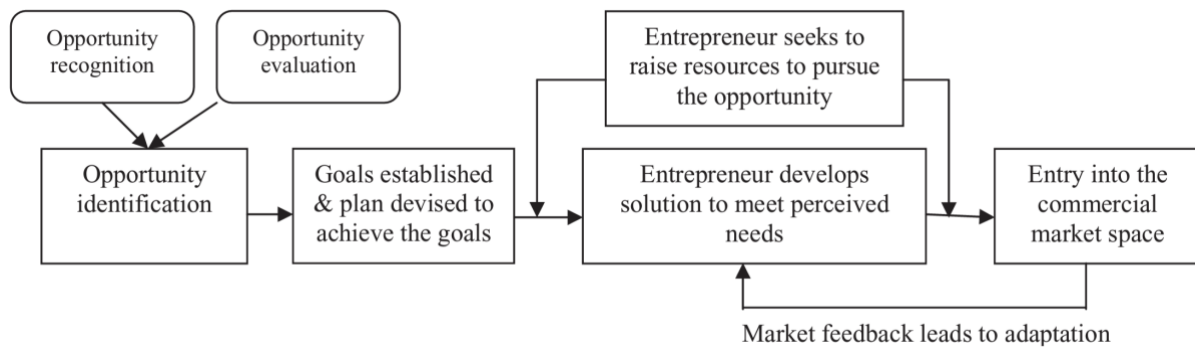


Effectuation represents a flexible and adaptive decision-making logic that contrasts with causation, a planning-based approach. Causation builds on the belief that “To the extent that we can predict the future, we can control it,” (Sarasvathy 2001, p. 252). This approach requires an understanding of the market, beginning with the identification of opportunities based on historical data to evaluate and determine how to exploit them (Fisher, 2012). It’s a systematic and purposeful process, as proposed by Delmar and Shane (2003), who view the entrepreneurial process as directional with various interdependent components, and open to feedback loops.

In the causation framework, decision-makers focus on predictable aspects of an uncertain future to identify opportunities and predict the development of new products or markets (Sarasvathy et al., 2008; Fisher, 2012). Once an opportunity is identified, causation involves formulating a specific goal and selecting the means to achieve it, identifying the desired effect and the resources needed to realize it (Sarasvathy, 2001). Causation assumes that the causality between means and effects can be understood, viewing the world as a puzzle where all pieces are available but need to be put together (Chandler et al., 2011).

At its core, while effectuation processes are connected to non-predictive strategies, causation represents a logical, rational system consistent with predictive planning (Wiltbank et al., 2006). When decision-makers believe the future is reasonably measurable and predictable decision-makers are likely to invest time and effort into an analysis of information (Sarasvathy, 2001).

Figure 2 The causation process (Fisher, 2012, p. 1024)



2.2.1 Differences between effectuation & causation

The difference between the two approaches can be illustrated using a simplified example from Sarasvathy (2001). Imagine the task of preparing a meal for dinner. One can adopt either a causal or an effectual approach. In the causal approach, the individual would first decide what meal to cook and then purchase all the specific ingredients required to prepare that specific dish. In contrast, the effectual approach would begin with the ingredients already available in the kitchen, and the individual would inventively explore how to combine these ingredients into a meal.

Effectuation, originating from decision-making theories such as March (1991), Simon (1959), and Weick (1979), consists of five principles that are commonly discussed in the literature (Sarasvathy, 2001, p. 252). However, these principles do vary across different publications (Sarasvathy, 2008; Dew et al., 2009a; Chandler et al., 2011; Brettel et al., 2012; Reymen et al., 2015). This study adopts a theoretical perspective that recognizes effectuation and causation as decision-making logics for reducing and navigating uncertainty. It compares effectuation and causation based on four dimensions: (1) the basis for taking action, (2) the view on risk and resources, (3) the attitude toward unexpected events, and (4) the attitude toward outsiders. This approach aligns closely with the work of Dew et al. (2009a) and Reymen et al. (2015), while also considering the methodologies used by Chandler et al. (2011) and Brettel et al. (2012).

Basis for taking action – Means vs goal-driven. The underlying logic of how one decides to act differs between effectuation and causation. Through the causation approach, entrepreneurs or entrepreneurial teams begin by establishing a specific goal or desired effect. They then proceed to analyze the environment by examining competitors, market trends, and perceived competitive advantage. This analysis forms the basis for developing a strategic plan that includes the resources and actions required to achieve the predetermined goal (Brinckmann et al., 2010; Miller and Cardinal, 1994). Effectuation, on the other hand, approaches decision-making by taking into account a given set of means and directing efforts toward achievable outcomes that can be generated using those means (Sarasvathy, 2001; Sarasvathy and Dew, 2005; Reymen et al., 2015).

View on risk and resources – Affordable loss vs expected return. The two logics also differ in terms of the size and flexibility of the investments sought and made. A causal approach relies on a clearly defined business plan and often pursues large investments, where the aim is to maximize expected returns by evaluating different scenarios. Effectuation, on the other hand, emphasizes the inherent unpredictability of the environment, and calculations of expected returns do not determine project selection. Instead of requiring investors and founders to invest as much as possible to maximize potential future returns, the focus is on the current situation and the assets under the control of investors and founders. Investments should be limited to what the decision-makers can afford to lose (Dew et al., 2009). This includes making 'small step' investments, conducting experiments, and mobilizing or reallocating available local resources. For example, by bootstrapping (Reymen et al., 2015; Winborg and Landström, 2001).

Attitude toward unexpected events – *Leveraging vs avoiding contingencies*. The way entrepreneurs react to their market environment and deal with unexpected events differs depending on whether they use effectual or causal logic. Causation attempts to execute a strategy as planned while reacting negatively to unexpected events, negative but also positive (Denrell and March, 2001), which can occur as interruptions to strategy execution (Garud and Van de Ven, 1992; Choi et al., 2008). Effectuation, on the other hand, is a dynamic process that seeks and incorporates feedback to adapt to changing circumstances. This adaptability enables the flexibility to seize, transform, and leverage these unexpected events to create new opportunities (Chandler et al., 2011).

Attitude toward outsiders – *Self-selected partnerships vs competitive analysis*. The two logics also differ with regard to how the entrepreneur interacts with and involves other people and organizations in the venture creation process. Entrepreneurs using causal logic tend to protect knowledge from outsiders and use it to build their competitive advantage (Reymen et al., 2015). When they form alliances with other firms, these are carefully planned, partners are carefully chosen based on complementary competencies to achieve the goals of the organization, and alliance contracts carefully specify responsibilities (Read et al., 2009). In contrast, under an effectual logic, venture creation processes are open to, and even require, the participation of other people and organizations as committed stakeholders. Even before determining what the markets and other objectives of the enterprise will be (Dew et al., 2009). Stakeholders provide resources, reduce uncertainty, and shape the goals and direction of the company. For example, prototypes are shown to potential customers to gather feedback and potentially attract new stakeholders.

Table 1 Differences between effectuation and causation

	Effectuation	Causation
Central logic	<i>“To the extent that we can control the future, we do not need to predict it”</i>	<i>“To the extent that we can predict the future, we can control it”</i>
Basis for taking action	Means-driven	Goal-driven
View on risk and resources	Affordable loss	Expected returns
Attitude toward unexpected events	Leverage contingencies	Avoid contingencies
Attitude toward outsiders	Self-selected partnerships	Competitive analysis

2.2.2 Coexistence and interplay between effectuation & causation

In their comprehensive literature review on effectuation theory, Grégoire and Cherchem (2020) identify an interesting shift in the academic understanding of the relationship between effectuation and causation. Early studies emphasized the differences between effectuation and causation, presenting them as distinct and often opposing models of human action. However, rather than viewing these strategies as either-or alternatives, recent research suggests the two approaches can co-exist and even complement each other. They present evidence suggesting that integrating both causation and effectuation, especially in highly innovative projects, can yield significant benefits for venture performance. They therefore emphasized the value of the dynamic ability to integrate, merge, or transition between causal and effectual modes of action. This change in perspective opens the door to a deeper investigation of how entrepreneurs, given their unique circumstances and obstacles, can make use of both approaches.

Literature indicates that the preference for either decision-making logic is influenced by several factors, including the developmental stage of the country, the industry type, the age of the firm, and the tools used for performance measurement. New startups and early-stage companies face resource constraints and uncertainties, making it hard to rely only on causation (Zhang et al., 2022). Berends et al. (2014) also highlight that effectuation is commonly employed during the early stages of a venture, whereas

causation becomes more emphasized as the firm progresses into later stages. This observation is supported by the findings of Reymen et al. (2015) which indicate that flexible decision-making is dominant in the initial stages of venture creation, while a shift towards more planning-based decision-making occurs as both the new venture and its market matures (Sarasvathy, 2001; Alvarez and Barney, 2005; Reymen et al., 2016; Grégoire and Cherchem, 2020). Based on their observations, they propose a hybrid approach to strategic decision-making that combines both effectuation and causation logic and that the emphasis on these logics fluctuates and evolves. These changes in decision-making approaches are proposed to be influenced by strategic scoping decisions that determine the range of technologies, products, and markets that founders focus on at any given time. Expanding the scope of a company leads to effectual decision-making characterized by flexibility and experimentation. When the scope narrows, a causal logic is adopted, with a focus on achieving greater efficiency. These scoping decisions are driven by perceived changes in external and firm conditions, such as uncertainty, available resources, and stakeholder pressure (Reymen et al., 2015).

The debate on how effectuation and causation affect venture outcomes remains ongoing. Some researchers argue that not all principles of effectuation are positively associated with new venture performance (Read et al., 2009) in all contexts (Baron, 2009). There are opposing views, with others suggesting that effectuation, overall, has a positive effect on corporate performance in the context of innovation (Brettel et al., 2012). The context, including resource availability and the firm's development stage, plays a critical role in determining the effectiveness of either approach (Sarasvathy, 2001; Read and Sarasvathy, 2005; Berends et al., 2013; An et al., 2019). Effectual decision-making may be particularly advantageous during the startup phase when uncertainty is at its highest (Alvarez and Barney, 2005; McMullen and Shepherd, 2006; Sarasvathy, 2008). Studies have also shown that planning tends to be less effective in young and small ventures (Brinckmann et al., 2010). Smolka et al. (2018) provide empirical evidence supporting the synergistic relationship between these logics, suggesting their combined application can significantly contribute to venture performance.

Practical applications of combining effectuation and causation reveal their strategic value in different contexts. Alzamora-Ruiz et al. (2021) find that for technology SMEs pursuing product innovation, using both logics as dominant mechanisms can be very effective. However, an ambidextrous approach becomes necessary when focusing on process innovations. Empirical studies show that ventures may alternate between effectual and causal logic (Reymen et al., 2015; Jiang and Rüling, 2019), especially when they transition from a creational to a discovery setting, which often happens when achieving a "product-market fit". Which refers to the alignment between a startup's validated business model and the demands of its customers (Blank and Dorf, 2012; Ries, 2011; Frederiksen and Brem, 2016). This fit serves as a pivotal moment in the startup's journey. By employing effectual principles such as iterations, interactions, and experiments, entrepreneurs can transition from a state of uncertainty, where they generate knowledge about potential opportunities, to a state of risk, where they refine that knowledge to discover opportunities through causal planning (Ghezzi, 2019).

In terms of practical implications, Brinckmann et al. (2010) suggest that small firms benefit from dynamically using planning (causation) and action-oriented (effectuation) approaches. In the context of business model development, Reymen et al. (2016) highlight the role of effectual logic in developing viable value propositions for specific customer segments, with causal logic then used to refine the other business model components. This adaptive strategy is particularly critical in resource-constrained scenarios, advocating for minimizing technological and market uncertainties through effectual strategies before committing significant resources. Moreover, entrepreneurs aiming to secure investments must consider an important factor: while the affordable loss principle of effectuation can be advantageous in the early stages of a venture, a more causal approach may be preferable as the business progresses. Therefore, entrepreneurs should also consider profit forecasts and deliberate sales planning to some extent when looking for investments (Smolka et al., 2018). This strategic approach not only enhances firm performance but also serves as a signal to investors, demonstrating the entrepreneur's commitment

and ability to pursue growth in future lifecycles (Fisher et al., 2016). Ghezzi (2019) found that digital entrepreneurs met this challenge by pragmatically incorporating a sequential approach to the creation and discovery process and using appropriate tools. Initially, they engaged in iteration and experimentation through LSAs (Lean Startup Approaches) to generate opportunities and gather valuable data, information, and knowledge. They then used this knowledge to develop a well-structured business plan aimed at discovering opportunities for scaling, market penetration, and overall business growth. Entrepreneurs employ resources to achieve goals and their judgment to make decisions (Foss and Klein, 2012). Understanding how entrepreneurs make decisions and why some of them lead to failure is crucial given that decision-making is essential for business success (Ilonen et al., 2017). The distinction between effectuation and causation, as introduced by Sarasvathy in 2001, has become an established perspective for decision-making in the field of entrepreneurship and has shown its value in broader domains such as strategy (Wiltbank et al., 2006) and innovation (Brettel et al., 2012; Berends et al., 2013). The distinction is used in the current study to better understand the behavior of novice entrepreneurs in the context of business incubation. Nevertheless, recent studies provide strong evidence that the two logics can coexist and that their interaction can effectively complement each other (Grégoire and Cherchem, 2020). Thus, although this study considers effectuation and causation as different constructs, it does not consider them as either-or alternatives and seeks to build on the recent shift in academic perspective.

2.2.3 Novice and expert entrepreneurs

Entrepreneurship is often considered a form of expertise that is developed through experience and deliberate practice (Read and Sarasvathy, 2005). Previous research has shown that, unlike novices, highly experienced entrepreneurs rely on effectuation (Dew et al., 2009). These expert entrepreneurs differ in several ways from inexperienced, novice entrepreneurs, which could explain these findings. Novice entrepreneurs may struggle to apply effectuation principles, given their limited means and networks (Read and Sarasvathy, 2005). Experts, on the other hand, have accumulated social capital that includes a network of social and business contacts, which is considered essential for starting a new business (Westhead et al., 2005; Greve and Salaff, 2003). Experts possess a large mental database of experiences and knowledge that they use to make intuitive decisions in challenging situations. This contrasts sharply with novices, whose lack of experience often makes it difficult for them to make informed intuitive decisions (Hubert and Dreyfus, 1986). Moreover, experts can frame problems in such a way that they build contingencies into their strategy, whereas novice entrepreneurs try to avoid contingencies (Westhead et al., 2005).

Overall, the differences between novice and expert entrepreneurs suggest that entrepreneurship is a learning process, with each challenge serving as an opportunity for growth (Read and Sarasvathy, 2005). As mentioned earlier, incubators serve as a resource for new entrepreneurs, often offering advice and support from more experienced entrepreneurs. This can potentially narrow the gap between an experienced and inexperienced entrepreneur.

2.3 Business incubators

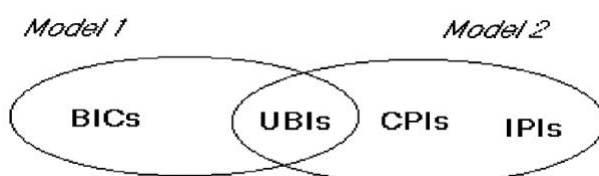
Business incubators aim to promote local employment, economic development, and technology transfer by providing a supportive environment for startups. They provide flexible rental space, shared services and equipment, and access to a network of advisors in areas such as finance, marketing, and manufacturing (Bergek and Norrman, 2008). According to the majority of researchers, business incubation represents a systematic way of offering business assistance to companies in the early stages of their development (Hackett and Dilts, 2004). By ensuring that startup companies get the resources, services, and support they need, incubators usually seek to create a nurturing and supportive environment. New startups frequently lack or are unable to afford these resources (Peters et al., 2004). On top of this, the required resources cannot be known at the start but are revealed as a venture progresses. Incubators can provide resources directly based on the needs of the startups, as well as indirectly provide access to resources through formal and informal networking with sources outside the incubator (Peters et al., 2004). Business incubators are believed to significantly improve the survival

and growth prospects of startups and small businesses at an early stage of development by providing resources and services in one location and reducing overhead costs by sharing facilities (European Commission, 2002). There have been quite a few definitions of business incubators offered in the literature on incubators (Hackett and Dilts, 2004; European Commission, 2002). This embraces the business incubators that have been described over the years under different names, e.g., ‘seed beds’ (Felsenstein, 1994); ‘networked business incubators’ (Hansen et al., 2001); ‘bottom-up business incubator’ (Bøllingtoft, 2012) ‘business innovation centers’ (Grimaldi and Grandi, 2005), and much more (European Commission, 2002). The various labels used reflect various priorities and tactics employed by business incubators (Aernoudt, 2004; Grimaldi and Grandi, 2005).

The different categories of business incubators that have been presented over the years reflect these various priorities and approaches as well (Grimaldi and Grandi, 2005). The first generation of incubators focused primarily on providing office space and a variety of shared facilities to their tenants. These services were expanded in the second incubator generation to include various consulting services, network access, and sometimes even venture capital in the 1990s. The third generation added to this and began in the late 1990s, focusing primarily on high-tech and IT startups (Hackett and Dilts, 2004). As a result, providing physical infrastructure is no longer the only aspect of business incubation today (Hackett and Dilts, 2004). The incubator’s role has expanded to include the provision of training, networking opportunities, and consulting services to new and young businesses in all fields of expertise (Peters et al., 2004). Even though they can help a variety of businesses, incubators frequently support technology-based businesses (Smilor, 1987; European Commission, 2002). Incubators aim to effectively link talent, technology, capital, and know-how to accelerate the commercialization of technology by providing a variety of services and support to startups.

Grimaldi and Grandi (2005) emphasized the need for a new incubation model in response to changing business expectations. By examining the evolution of the incubator industry and considering previous attempts at categorization, the authors devised two primary incubation models. Model 1 and Model 2 include four types: Business Innovation Centres (BICs), University Business Incubators (UBIs), Corporate Private Incubators (CPIs), and Independent Private Incubators (IPIs).

Figure 3 Typology of incubators (Grimaldi and Grandi, 2005)



The four types are classified according to their offerings and underlying financial models. At one end of the spectrum are Business Innovation Centers (BICs), whose incentives are usually based on regional development goals, such as job growth and technological advancement. These incubators offer a range of services from physical infrastructure to management expertise, often at subsidized rates to help their tenants reduce the cost of running their business. These types of incubators fit well with the needs of companies operating in traditional sectors and are usually funded by a combination of tenant fees and government subsidies. On the other hand, private incubators, such as Corporate-Private Incubators (CPIs) and Independent Private Incubators (IPIs), have a profit-oriented approach and focus on providing both financing and intangible, high-value assets as part of their services. CPIs are part of large companies and aim to support the emergence of new independent business units. IPIs are incubators set up by individuals or groups of individuals who invest their own money. These private incubators aim to eventually realize returns on investment through the scaling and successful exit of their incubatees in which they own equity. In addition to funding, private incubators also provide access to sources of technological expertise and economic/management knowledge, both internal and external. This emphasis on networking distinguishes these incubators as belonging to model 2. University Business

Incubators (UBIs), on the other hand, are more challenging to categorize within these models due to their revenue model. While they share similarities with Business Innovation Centres (BICs), as they rely on tenant fees and public subsidies, their main objective, next to their regional impact, is to facilitate knowledge-based companies' continuous access to advanced technological knowledge, academic infrastructure (such as laboratories and facilities), and academic networking. The UBIs' incentives are often aligned with the university's broader goals of promoting innovation, commercializing research, and enhancing the institution's reputation, rather than direct financial profit. Model 2 incubators are further distinguished by the active role of management in the entrepreneurial activities of the tenants. Here the management team actively supports startups during the various phases, from the initial definition of the business concept to the final phase, when the startups are independent and self-sustaining organizations.

Although there are no two business incubators that are exactly alike, it is argued that basic key characteristics of incubators can be identified (Hackett and Dilts, 2004; Peters et al., 2004). Key characteristics that are mentioned are co-location of business through shared office space, low-priced rent, shared support services to reduce overhead costs, business support or advice, networking, and internal and/or external network provision (Hackett and Dilts, 2004; Peters et al., 2004; Bergek and Norrman, 2008). Far fewer incubators offer services such as access to internal seed and venture capital funds, human resource assistance, recruitment and mentoring support, and partner searches (European Commission, 2002). Hansen et al. (2000) highlight access to a structured network as one of the characteristics of better incubators.

Incubators have evolved from merely offering office space to providing training, networking, and advice, making them an innovative vehicle for business development (Peters et al., 2004). To leverage entrepreneurial talent and/or resources, the incubator can act as a "bridge" between its tenants and their environment (Bøllingtoft and Ulhøi, 2005; Grimaldi and Grandi, 2005). Access to information, knowledge, and expertise could be made available as a result, which could lessen the uncertainty experienced by startup businesses and young companies. According to Peters et al. (2004), access to a network can compensate for an entrepreneur's lack of established networks. This indicates how the incubator environment can promote the exchange of networks, advice, and ideas.

According to Høvig et al. (2017), it is common for many business incubators to implicitly or explicitly favor the recruitment of firms that adopt a causation approach. By selecting candidates who display a strong commitment to a well-defined entrepreneurial goal or business plan, business incubators aim to attract causal entrepreneurs. However, this recruitment approach, as highlighted in the study, poses challenges in fostering a culture of information sharing and inter-tenant networking within the incubators. According to the findings, entrepreneurs who take a causation approach are less likely to share ideas and resources. The study, on the other hand, demonstrates how effectuation plays an important role in entrepreneurial inter-tenant networking, as incubated effectual entrepreneurs are more likely to share ideas and value inter-tenant networking in the pursuit of leveraging the venture. Tötterman and Sten (2005) found that relationships among tenants are not as sophisticated and "relationships are mainly basic information exchange, often related to daily issues" (p. 502). Furthermore, "incubators seem to find it hard to systematically tailor-make their services to serve effectively each individual tenant" (p. 503). According to a recent study on customer satisfaction in business incubators, there appears to be a mismatch between what incubatees want and what business incubators offer (Abduh et al, 2007). This gap between the desires of entrepreneurs and the realities of business incubators sparks a debate about whether business incubator managers truly understand their clients and whether the business incubation programs they have designed meet the needs of entrepreneurs.

The unique characteristics of an incubator can influence the entrepreneurial behavior of tenants. For example, the ability to share costs and resources with other companies can shift the emphasis from

competition to cooperation. Moreover, the proximity of multiple companies can promote collaboration and joint projects. Advice from experienced entrepreneurs can influence incubator firms' behavior toward effectuation, which is associated with entrepreneurial expertise. In contrast, a structured and rigid incubation program with the end goal of raising capital where business plans are preferred may influence tenants toward a more causal approach.

2.4 Propositions

This section formulates expectations for the outcomes of this study in the form of propositions, derived from its theoretical framework. These propositions will guide the scope of the research and the discussion of the results. It's important to note that the study also seeks to explore novel insights, including previously underexplored mechanisms and variables that may influence tenants' decision-making styles. Any significant novel discoveries will be thoroughly examined and incorporated into the final analysis.

The study draws on Reymen et al. (2015), who investigated how effectuation and causation logics evolve through different entrepreneurial phases: idea, pre-startup, startup, and post-startup. They assessed the dominance of each logic within these phases through the use of event lists, determining dominance based on which logic was coded more frequently. A finding from their study was the clear dominance of effectuation in the idea phase, where it was observed at a ratio of approximately 78% to 22% for causation. Although this study will not be using a similar quantitative approach with event lists, this ratio of dominance does serve as a guiding thought.

The first point of influence of the incubator is its selection process. Incubators are known to use certain selection criteria to identify business ideas and startups with high growth potential. These criteria may favor entrepreneurial teams that have a clear goal and path to profitability. As a result, entrepreneurs whose startups meet these criteria may already be inclined to make causation-based decisions. Furthermore, novice entrepreneurs tend to have lower entrepreneurial self-efficacy and are taught certain business modeling tools and methods during their education. Novices therefore in general tend to rely more heavily on causation-based decision-making. Furthermore, quantitative analyses by Aarstad and Jakobsen (2019) show a link between the incubator's geographic location and its entrepreneurs' decision-making logic. It discovered that the incubator's geographic location in sparsely populated economic regions is associated with tenants using predominantly causation logic, whereas a geographical location in densely populated economic regions is associated with tenants predominantly using effectuation logic. According to them, incubator qualities can influence entrepreneurial causation and effectuation logic. As a result, regional features may influence business incubator characteristics, hence affecting entrepreneurial causation and effectuation logic. These findings are relevant as the two incubator contexts in which the respondents are both located in less densely populated regions. Thus, it is expected that the entrepreneurs working within these incubators are more likely to adopt a causation approach in their decision-making processes. These factors lead to the following proposition:

Proposition 1: *The dominant decision-making logic of incubated novice entrepreneurs is causation.*

Since the early stages of entrepreneurial development are characterized by high uncertainty and limited resources, effectual decision-making is more relevant and used more often. Reymen et al. (2016), who linked business modeling to decision-making practices found that effectual decision-making is primarily used in the early stages to create a value proposition for a particular customer segment. This can be seen in receiving commitments from potential customers and successful experiments, which then reduce market and technological uncertainty. However, as new ventures approached the implementation stage, the focus gradually shifted towards exploitation, and causal decision-making gained dominance. As uncertainty decreases, and with a clearer vision of their business and available market feedback, there is frequently a shift towards causal logic with an emphasis on defining the remaining components of the business model in relation to the established value proposition and customer segments. These details are

then often documented in a comprehensive business plan. In conclusion, in the early stages of development, effectuation is more prevalent, whereas causation is more dominant in later stages (Berends et al., 2014; Reymen et al., 2015). Therefore, we can also expect this shift to happen. However, although these studies identified the shift from effectuation to causation, they studied founders with varying amounts of prior entrepreneurial experience, even entrepreneurs who were considered highly experienced. The current study focuses specifically on novice, inexperienced entrepreneurs. Literature suggests that novice entrepreneurs rely more on causation based on, among others, their limited means and networks, inability to make intuitive decisions, and tendency to avoid contingencies (Westhead et al., 2005; Read and Sarasvathy, 2005; Dew et al., 2009). Therefore, also considering the expected causal influence of the incubator, it leads to the following propositions:

Proposition 2: *In the idea and pre-startup phases, incubated novice entrepreneurs predominantly use causation-oriented decision-making logic.*

Proposition 3: *As startups advance into the startup and post-startup phases, the use of causation-oriented decision-making is expected to further increase among incubated novice entrepreneurs.*

According to Ghezzi (2019), adopted Lean Startup Approaches (LSAs) tend to influence entrepreneurs to adopt a creational and effectual approach, especially in the earlier stages. However, other stakeholders within the entrepreneurial ecosystem still anticipate entrepreneurs to adhere to a discovery and causation approach, particularly when it comes to the outcomes they deliver and present, such as the business plan. This traditional expectation better aligns with the established due diligence process based on risk assessment and management (Drover et al., 2017). Workshops and guidance focusing on business planning and market research etc., part of a likely more causal-based incubator program, could therefore encourage and/or force causation-based decision-making practices. Therefore, the following proposition is formulated:

Proposition 4: *Even though entrepreneurs want or should display effectual action in the early phases of venture development, they are hindered by the causal influence of the incubator program.*

Between the two studied incubators, there is a notable difference that may impact the decision-making practices of incubated entrepreneurs. As the Individual Private Incubator (IPI) participates in the incubated ventures, it has certain profit incentives that the University Business Incubator (UBI) does not. In their research on different entrepreneurial ecosystems Hubner et al. (2021) point out that in the Silicon Valley ecosystem, it was commonly believed that entrepreneurs needed to conduct competitor analysis and present a business plan to secure funding. This requirement of planning and analysis suggested that entrepreneurs, despite dominant signs towards effectuation in other aspects, were pushed to adopt a more causal thinking mindset during the funding process. Furthermore, Reymen et al. (2015) reveal that venture scopes can affect decision-making styles and mention that stakeholder pressure is a factor influencing venture scoping decisions. They discover that stakeholders such as investors frequently support a narrower rather than a broader venture scope. Many investors are still convinced that a focused approach is effective. They may see a wider scope as evidence of the entrepreneurs' inability to 'do their homework.' Similarly, investors may be resistant to changes in venture scope, questioning whether the initial technology, product, or market selection was incorrect or whether the problems are the result of poor execution by the venture's founders. Investors, in this case, the participating incubator, are likely to prefer a broader scope at the portfolio level rather than within each individual company. This profit incentive may encourage them to pursue well-defined market opportunities, focus on scaling, and pursue strategies that maximize returns for both the entrepreneurs and the incubator. This fifth and last proposition is formulated to explore this difference:

Proposition 5: *The Individual Private Incubators' (IPI) profit incentives may steer entrepreneurs more toward causal decision-making, in comparison to University Business Incubators (UBI).*

3. Methodology

3.1 Research design

The research design was informed by the central research question, supported by the theoretical framework and propositions. These further guided the case selection data collection and analysis process. This study used an exploratory qualitative research design, with semi-structured interviews as the primary data collection method (Maxwell, 2012). This allowed for an in-depth exploration of the decision-making styles of incubated novice entrepreneurs, as well as an investigation of the influence of incubators on their decision-making processes. Arend et al. (2015) highlighted the limitations of previous quantitative research in capturing the nuanced complexities of effectuation theory. In line with their recommendation, this study adopted a qualitative approach to gain richer insights by examining the subtle dynamics at play, thus providing a more comprehensive understanding of the entrepreneurial process.

The dual aim of this study was to explore and explain. Initially, the open-ended research question sought to explore how novice entrepreneurs navigate decision-making styles in the incubation context, through the lens of effectuation theory. Then, there was a shift towards an explanatory focus involving analyzing emerging patterns, insights, and variables to explain the role of incubators and/or other factors in influencing these decision-making styles aiming to explain why entrepreneurs in this context may adopt either effectuation, causation, or a combination of both.

While the primary goal of the research was not to generalize findings, studying entrepreneurs within two different incubators enhanced the potential to apply the findings to other incubators with more confidence beyond the context of a single incubator (Flyvbjerg, 2006). Relying on a single incubator could lead to findings that are too specific or idiosyncratic to that particular organization. Studying two incubators may also reveal unique or common elements in the different incubators that may not be apparent when studying only one. Because each incubator has its unique culture, structure, resources, and programs, there was also more diversity in the data, which enriched the data. Comparing the findings in two different incubators helped validate the results. If patterns or themes were observed in both incubators, it would strengthen the reliability of these findings.

The study prioritized depth of understanding over breadth, exploring the phenomena within these specific contexts in detail. Considering the central research question and focus of the study, studying two incubators provides sufficient scope for several reasons (Yin, 2014). Studying entrepreneurs within the two incubators allowed for a comprehensive exploration of phenomena within these specific contexts. The depth could reveal nuanced insights about the entrepreneurial process and decisions that might be lost in a broader, less detailed study. In a statistical sense, it would not allow for broad generalizability. However, this study focused on transferability, where insights gained in specific cases could be applied to or provide insight into similar contexts (Magnani and Gioia, 2023). Given the idiosyncratic nature of startups and the constraints and practical scope of a master's thesis, focusing on two incubators allowed for an in-depth investigation without sacrificing the nuanced details necessary for a thorough understanding.

Studying entrepreneurs within both University Business Incubators (UBIs) and Individual Private Incubators (IPIs) in particular was valuable because of their differences and similarities. While they likely offered different resources, networks, and support systems, their goals were similar in the way that they both guided entrepreneurs through the early entrepreneurial stages filled with uncertainty. Studying two different types of incubators provided valuable insights because they housed different types of entrepreneurs and had different cultures and networks. Each of the two incubators represented a distinct and important model within the business incubation spectrum. Both the University Business Incubator and the Independent Private Incubator in this study were active and dominant players that both provided access to rich and in-depth data. This was primarily because of the personal connections

of the researcher, their openness to research collaborations, and the transparent nature of their operations. They both housed a diverse set of active entrepreneurs with different backgrounds operating in different industries. Both incubators were aligned with current (technological) market trends and shifts within the entrepreneurial landscape which made these two especially relevant for exploring entrepreneurial decision-making within incubators. Each incubator provided access to entrepreneurs and startups that have gained market traction, navigated through various developmental stages, and are still operational. Based on the incubator typology of Grimaldi and Grandi (2005), selecting a UBI and an IPI, this research covered a broad spectrum of incubator types, from those embedded within academic settings to those driven by private sector interests and dynamics. This allowed for a comparison of different ends of the incubator spectrum, potentially leading to more generalized findings across incubators. However, both types of incubators were similar in the sense that they both focused on new technology and scalable business models and, in both UBIs and IPIs, there was an active role of incubator management in supporting their tenants in navigating the various early startup phases.

3.2 Sampling and incubator descriptions

Several players within the incubation program were interviewed to receive raw data from different angles and perspectives. In addition to entrepreneurs, managers from each incubator were also interviewed, which would serve an important purpose. First, the managers could provide an overarching view of the incubator's operations and strategic direction. Furthermore, managers could offer insights into how the incubator was designed and how it is intended to influence and support its tenants. They could also potentially provide knowledge about the incubation process and context that entrepreneurs themselves were not fully aware of, including internal processes and specific rationales behind the incubator programs. While the tenants could provide insights into subjective information about the incubator, talking to managers would overall provide a more objective perspective of what the incubators aimed to accomplish. It could also provide information about the selection criteria used which could affect decision-making styles present in the incubator. It also allowed a comparison between what entrepreneurs indicate and what managers think is needed in the different phases. They could further give insights into the daily challenges faced by the incubator in supporting their tenants. The additional layer of data from the managers would provide a complementary perspective to that of the entrepreneurs. Their insights were crucial for understanding the systemic and structural factors that enabled or hindered entrepreneurial success within the incubator's context.

Purposive sampling was used to select cases that were information-rich and could help extend the theory (Eisenhardt and Graebner, 2007). Entrepreneurs from both incubators, as well as at least one incubator manager from each, were to be interviewed. The selected cases had to be similar in a few aspects. First, the founders of the startups had to be novice entrepreneurs when they started their businesses. This meant that they did not have substantial prior entrepreneurial experience, especially in startups. Second, the startups must have been developing or using technology in a product or service that involved technological and market uncertainty, as well as uncertainty about commercialization options, increasing the likelihood that their startups were facing significant uncertainty during their development. The last criteria were that the startups were, in any form, guided by a business incubator program during the development of their firm and that collection of information about decision-making during their development was possible. Despite differences in their ages, the ventures had all gone through similar phases. Limiting the selection to ventures that are technology-based and run by novice entrepreneurs, ensured that observed differences in effectual or causal decision-making were not due to these factors. The founders or co-founders of the startups, who made business decisions, were to be interviewed. The following descriptions of the two incubators are based on both public online information and information from interviews with incubator managers.

The University Business Incubator: University of Twente - Novel T

Novel T, the incubator of the University of Twente, challenges entrepreneurs with innovative ideas to

start, innovate and grow. Novel T has several programs such as the START and ADVANCED programs through which they support entrepreneurs in all phases of the entrepreneurial journey, from the creation of the business case to the growth phase. The START program is aimed at validating market interest in a product, while the ADVANCED program focuses on building the business, including fundraising, legal aspects, and team building. The incubator provides access to knowledge, talent, capital, research and testing facilities, and their network. They do this without a profit motive. The incubator is a foundation established by the University of Twente, Saxion University of Applied Sciences, Province of Overijssel, Municipality of Enschede, and Twente Board. This is how Novel-T contributes to more economic growth in the region as well as a sustainable, healthy, and safe society. Their ultimate goal is to assist 100,000 entrepreneurs in bringing their innovations to market by 2033 (Novel T, 2023). Novel T does not have strict criteria for selecting entrepreneurs, but they prefer projects that fit into the regional startup ecosystem and have an innovative or technological edge. Even though Novel T facilitates demand for both younger, as well as more seasoned entrepreneurs, most entrepreneurs active in Novel T are first-time founders.

The Independent private incubator: De Gasfabriek - Codidact

The entrepreneurial hub of Deventer, De Gasfabriek, is home to Codidact, the IT startup incubator born from the vision of expert entrepreneurs eager to share their wisdom. Over time, this initiative developed into Codidact (De Gasfabriek, 2022). The mission behind Codidact is to foster an environment that empowers entrepreneurs to take control over their professional careers. Codidact moves away from the traditional top-down incubator approach and encourages proactive self-direction. It specializes in scalable entrepreneurship through emerging technologies, such as the Internet of Things, cloud computing, and big data, and recognizes the enormous potential of digital transformation. Codidact supports entrepreneurs at all stages, including the ideation phase, and capitalizes on its extensive network for collaborative idea generation. It takes a long-term investment perspective of eight to ten years, prioritizing the development of enterprise value over immediate financial returns. The ethos of the incubator, shaped by the previous achievements and insights of its founders, guides its activities. Their input based on previous successes and experiences has been important in determining how the incubator operates. Recently, there has been a focus on recruiting entrepreneurs with a higher level of education (HBO/WO), as it is believed that they are better suited for the conceptual and implementation phase that the incubator focuses on. However, Codidact does not rule out broadening the entry criteria in the future.

Table 2 Interview participants

Respondent	Position	Year of registration	Incubator type	Data collection
<i>E1</i>	Co-founder	2023	IPI	Online videocall
<i>E2</i>	Co-founder	2017	IPI	Online videocall
<i>E3</i>	Co-founder	2014	IPI	In-person
<i>E4</i>	Co-founder	2016	IPI	In-person
<i>E5</i>	Co-founder	2022	UBI	In-person
<i>E6</i>	Co-founder	2022	UBI	In-person
<i>E7</i>	Co-founder	2022	UBI	In-person
<i>E8</i>	Co-founder	2021	UBI	In-person
<i>M1</i>	Incubator manager	/	IPI	Online videocall
<i>M2</i>	Incubator manager	/	UBI	In-person
<i>M3</i>	Incubator manager	/	UBI	In-person

3.3 Data collection method

The researcher conducted a total of 11 semi-structured interviews, 8 of which were with entrepreneurs representing different startups and 3 with incubator managers. Each interview lasted about 1 hour and was conducted online or in the incubator. Visiting both incubators, the researcher also got an impression of their environments. All interviews were audio recorded. The semi-structured interviews enabled mutuality between the interviewer and interviewee (Galletta, 2013). This methodology enabled a natural flow of conversation, allowing for the exploration of unexpected points of interest (Kallio et al., 2016). Prior to conducting the interviews, two interview guides were developed, one for the entrepreneurs and one for the incubator managers. All interviews followed the same structure to ensure autonomy and consistency (Yin, 2013). The interview guides were designed to understand the decision-making processes during the development phases and to also focus on the influence of the incubators.

The interview guides for the entrepreneurs consisted of open-ended questions following a chronological order that allowed them to share their entrepreneurial journey (Clarysse and Moray, 2004; McMullen and Dimov, 2013). Since the entrepreneurial process is dynamic and evolves over time, this approach provided a framework that allowed the examination of how entrepreneurs' decision-making styles evolved through the different stages of their entrepreneurial journey. This revealed insights into how incubated entrepreneurs adjusted their decision-making strategies as their startups progressed. It also improved the depth and richness of the analysis because it allowed for a comprehensive exploration of contextual factors that influenced decision-making during the startup's evolution. And, as the support and resources provided by incubators may differ across the various venture creation phases it will provide a better understanding of the role, influence, and effectiveness of incubators in supporting entrepreneurs' decision-making at different points in the entrepreneurial process.

The questions were phrased in such a way that they could reveal the pursuit of either a causation or an effectuation decision-making approach. The events surrounding the initial idea and before the decision to start a company fell under the (1) idea phase. A question related to this phase was: *"How did you come up with the initial business idea?"* Events that occurred during this decision to pursue the opportunity but before the formal legislation and operationalization of the company were classified in the (2) pre-startup phase: *"What made you decide to pursue the opportunity and actually start the company?"* The (3) startup phase included the company's formal legislation, operationalization, and subsequent events leading up to the transition from technological development to revenue generation: *"What did the process of starting the company look like?"* The (4) post-startup phase covers all decision events representing this latter shift and subsequent events. Also, questions referring to their attitudes toward risk and reward, outsiders, basis for taking action, and contingencies were asked. These questions were based on effectuation theory. They were also asked about their perception of the role of the incubator. For example, questions relating to the influence of the program: *"Can you cite specific instances where the incubator's guidance, resources, or mentorship influenced your decision-making?"* Probing questions were used by the researcher when more clarification of the answer was needed.

The interviews with the managers first addressed their role within the incubator and the mission and vision of the organization. The four phases were then introduced, and questions were asked about the required and intended support: *"In your view, what do entrepreneurs need at the different stages of their startup's development?"* Then effectuation and causation were briefly explained, and questions were asked about the approach of the entrepreneurs and the incubator: *"How would you describe the decision-making styles of the entrepreneurs within your incubator?"* And *"Some entrepreneurs consider a business plan a crucial document for their business, while others may not place as much emphasis on it. What is your view on the importance of a business plan for startups within your incubator?"* Questions were also asked about their incentives, challenges, and selection criteria (see Appendix 1 for full interview guides).

3.4 Data analysis

The researcher transcribed the audio recordings using software and then personally reviewed and corrected them to ensure accuracy, allowing the data to be effectively coded and evaluated. This procedure took time, but it is an effective approach to becoming familiar with the data (Kiger and Varpio, 2020). The researcher documented their thought process by taking notes throughout the data analysis process to support the reliability of the results (Nowell et al., 2017). Data were organized and coded using the MAXQDA software. The data analysis was conducted using the Gioia methodology, a qualitative method known for its robustness in developing grounded theory. This approach ensured research rigor and credibility, aligning with the standards set by top-tier journals (Magnani and Gioia, 2023). Although the data were collected at the individual level, the analysis considered the entrepreneurs as one unit of analysis. Through the data analysis process, data from both incubators were synthesized to understand the collective experiences and behaviors of the entrepreneurs. This involved looking for themes and patterns that apply to the group as a whole, rather than individual experiences. The Gioia methodology allowed for a structured and systematic presentation of the data through a visual data structure. The approach is known for its structured and iterative, way of deriving inductive 1st order (informant-based) codes, abductive 2nd order (researcher-based) themes, and 3rd order aggregate dimensions. To ensure rigor in the qualitative analysis, the researcher iteratively went through the following three phases:

1. Initially, 1st-order open codes were generated from each interview, capturing expressions that reflected entrepreneurs' decision-making processes. Special attention was paid to the role of incubators and other influences in shaping these decisions. There was little attempt to distill categories at this stage, and the codes adhered closely to the language of the informants (Magnani and Gioia, 2023). The result of this primary round of coding was a detailed list of 974 specific codes, including statements such as "you can start selling before the product is ready" and "worked for a year for nothing." Through an iterative process of axial coding, as recommended by Strauss and Corbin (1998), similar codes were identified, grouped, and merged into a final set of 75 integrated first-order concepts. These codes correlated with the original data excerpts in MAXQDA, allowing careful comparison of the data obtained in each interview and in-depth analysis.
2. Second-order themes were then formulated using an abductive approach: comparing the informant-based 1st-order concepts with insights from the literature. Patterns and categories related to the 1st-order concepts were examined and captured in 2nd-order themes. At this stage, the researcher followed the recommendation of Grégoire and Cherchem (2020) in the way they recognized the valuable, precise, and detailed approach to measuring effectuation and causation by Reymen et al., (2015). Their study is known as one of the only studies that specified their coding schemes. The researcher used their coding schemes and indicators in the analysis, supported by his knowledge of effectuation theory. The four dimensions of effectuation theory: the basis for taking action, attitudes towards unexpected events, attitudes towards outsiders, and view on risk and resources served as a guiding framework. This facilitated the identification of both effectuation and causation logic within the data, as well as the refinement of their first-order concepts, further grounding them in the theory. This final collection of first-order concepts was approved by an academic expert on effectuation theory.
3. In the final phase, aggregate dimensions were formed, combining insights from the theoretically informed second-order themes and data-driven first-order concepts. These dimensions could contribute to the theories of effectuation and causation and possibly introduce new decision-making logics or nuances to existing ones.

4. Results

This chapter presents and explores the identified 1st-order concepts, 2nd-order themes, and aggregate dimensions. The data structure, developed through qualitative analysis of the semi-structured interviews, does not appear in a single table at the beginning or end of the chapter. Instead, it weaves through the results, providing a seamless and intuitive understanding of the data (see Appendix 2 for the full data structure). The results, sectioned by the aggregated dimensions, include relevant and explanatory quotes from interviews with entrepreneurs and incubator managers. The exploration begins with how entrepreneurial decision-making styles manifest themselves in real-world scenarios, addressing the core of the research question. This anchors the findings within the theoretical framework and ensures a contribution to the literature, laying the groundwork for a better understanding of the fundamental processes at play. Where relevant, it links these processes to the related phase(s), demonstrating the shifting needs and strategies of entrepreneurs as their venture progresses. It then examines the external conditions, highlighting the environmental factors that influence decision-making styles and adding depth to the analysis. This illustrates the complex interplay between an entrepreneur's context and their strategic choices. Following this, it delves into the internal conditions, exploring variables within the startup that further shape decision-making styles. It then examines the role of the incubator, demonstrating its contribution as an important element of the entrepreneurship ecosystem. This relates to the second component of the research question on the extent to which incubators support or hinder the decision-making process.

4.1 Effectual decision-making

Means driven action as a dimension dominantly surfaced, suggesting its vital role in the entrepreneurial process. It not only captures the use of existing resources but also the essence of effectuation; turning available means into an entrepreneurial end. **Spotting an opportunity based on their own existing knowledge and experience** captures how entrepreneurs use their existing knowledge and experience to identify promising business opportunities. It often lays the groundwork for their ventures in the *idea phase*. "I started experiencing that many of the technologies that we develop in our lab, once a Ph.D. student leaves, that technology is just gathering dust and it's wasted resources for four years which nothing happens with." (E5). "Eventually, you find something in that hobby that makes you think, hey, darn it, we can do more than what we initially thought. And that's where it starts." (E6). Entrepreneurs further seemed to be **using their knowledge base to make decisions**. They leverage their understanding of the market, technology, and their own business to make informed decisions without heavy reliance on external sources. "I made the decision. I said we're just going to do it. I just saw that this isn't working. I knew this was not going to be it." (E7). Interviewees were **leveraging existing skills and resources at hand**, using their strengths but also creatively leveraging their available resources, especially in the *pre and startup phases*. "My background is really in software engineering. That helped us a lot in the initial phase of the company. Because what we sold during the day, I had to program in the evening hours. But that means you understand the content. And I still have that now. So, when I talk to customers, I will always win on content." (E4). "So, the first prototype was; we had an old monitor lying around, we had a chair that we could kick apart for wood. And we started tinkering with a lot of duct tape in the end." (E3). This link between the early phases and effectuation was confirmed by an incubator manager. "I believe a lot of people start with effectuation: what do we have? That's also really the startup way. You often don't have a big bag of money to fund everything. You have to do it with the resources, the knowledge, the expertise that you have gathered around you over the years, looking for a network that is relevant and can help you." (M2). Frequently mentioned by both entrepreneurs and managers is that the entrepreneurs were **defining only rough visions while leaving the details open**. Based on their aspirations, intended impact, or broad market trends, the founders defined rough visions, but they recognized and embraced that the path to achieving them remains flexible. This approach seems to be recognized and supported by the incubators as all the managers mentioned entrepreneurs prefer broad visions - a dot on the horizon - while leaving the details to evolve. They mentioned supporting startups through this uncertainty by focusing on traction, market needs, and effective use of available resources.

They mention that many entrepreneurs enter the incubator with a basic idea but often lack a clear understanding of how to realize it. *"We didn't really have a very clear goal like it has to be a certain technology or it has to be a certain product-market combination. We were really in it with the mindset that we want to do fun things with new technology with young people."* (E4). *"We always knew that, we even stated it when we started, we are going to build a company that can go public. So that means an IPO. So, we had big dreams, but at that point in the beginning, we didn't know exactly which direction it would go."* (E7). Having this rough vision was also mentioned, and even encouraged by the incubator managers. *"Yes, depending on how early you are in the pre-startup phase, the more nascent you are, it's important to have some sort of vision. [] I think we are trying to find a certain balance in that, so we do set a clear goal, the classic dot on the horizon, and also look at how we could possibly get there. The path to it, we know, is unclear. That can't be defined in advance."* (M1). This seemed particularly relevant in the idea and pre-startup phases. In the idea – pre-startup and startup phases entrepreneurs were also actively **leveraging existing networks for opportunity creation & identification**. This involved using existing connections for knowledge exchange, securing meetings with influential individuals, and gaining access to valuable resources or potential clients. *"I knew the company; I just sent that person a message on LinkedIn. Then they said, 'Yeah, call me.' And from there, a meeting was arranged."* (E7). *"He has an extremely large network through his father but also built up himself through his studies at Nyenrode, which enabled us to sit at the table with interesting parties."* (E1). **Following personal principles and preferences**, in terms of beliefs, values, and interests is what led entrepreneurs in their decisions over expectations or market trends. This means pursuing ideas that resonate on a personal level, making choices based on gut feelings or selecting projects that satisfy a sense of curiosity and passion. This behavior manifested primarily in the idea – pre-startup and startup phases. *"So, you can make a very clear internal overview of what is my cost price per hour? And how much time do I expect to put into something and what do I earn with that? I am a bit further along with that because that's how we actually started to operate more from, say, the third-fourth year. In the first few years, we just said yes to a lot of assignments that we liked. And of which we also thought, well, this is just interesting, we said yes if it fits within our principles."* (E4).

The Affordable Loss dimension that emerged from the data explains entrepreneurs' view of risk and resources. Incubator managers also recognized that most entrepreneurs are first-time founders, at the beginning of their careers, and often start with limited financial resources but a lot of time and energy to explore. Entrepreneurs, in the pre-startup and startup phases, were **willing to make affordable personal sacrifices**. Which represents their willingness to endure short-term personal and financial hardships for the long-term success of their ventures. It often involved working long hours without immediate compensation, investing personal savings, and accepting lower standards of living to reinvest in the business. *"Then my partner and I said; 'we'll give it a year'". So what we're going to do is, we'll go a year with practically zero income."* (E4). On top of this, they seemed to have **deferred financial expectations** in which expected financial returns are not the primary objective or focus. They seemed to not calculate and prioritize their expected returns in the idea and startup phases and were willing to give up short-term profits in the expectation of building a more substantial, long-term business value. *"So, in the beginning, we had no idea what the revenues would be from the company before we started."* (E6). Before and during the operationalization of the startup, in the pre-startup and startup phases, entrepreneurs seemed to be **investing limited, small amounts of money, time, and effort** to avoid unnecessary expenses, stay lean, and focus on the essentials that contribute directly to business growth and development. Entrepreneurs are cautious with their time and investments and look for cost-effective ways to progress, often doing much of the work themselves to minimize expenses. *"Well, right at the start, so the first two years, you are just very practical. So, time is one of the most important resources that you have to manage."* (E4). Entrepreneurs seemed resourceful as they were actively **finding unused resources in the local environment**. This includes identifying and leveraging readily available but often overlooked assets within one's immediate surroundings like unused equipment or intangible resources such as grants, subsidies, or community support. *"Eventually, we received a subsidy, which saved us. Otherwise, we couldn't afford it."* (E6). In raising funding for their startup during the pre-startup and

startup phases, founders were **limiting stakeholders' commitments to levels that are uncritical to them** ensuring that the stakeholder's influence doesn't become so significant that it could dictate the company's direction. Instead of requesting that investors invest as much as possible to maximize potential future returns, investments sought and made were limited to what the decision-makers could afford to lose. It allowed founders to maintain control and stay flexible. This approach sometimes involved securing funding or support in stages, based on need, rather than receiving and possibly mismanaging a large sum all at once. *"We also had an agreement with the investor that we wouldn't receive the entire amount invested all at once. Instead, we would receive bits and pieces, as and when we needed them so that we wouldn't burn through it too quickly."* (E2).

Leveraging contingencies is the theme describing the attitude towards unexpected events. The incubated entrepreneurs demonstrated an adaptable and flexible attitude throughout their journey. Respondents demonstrated **strategic flexibility in response to market uncertainty**. This refers to the adaptive strategies entrepreneurs employ in the pre-startup and startup phases to navigate unpredictable market conditions. Respondents emphasized the need for startups, especially in high-tech sectors, to remain agile and respond to changing market dynamics and customer needs. Entrepreneurs are willing to pivot from initial plans, embrace new directions, and let go of strategies that are not yielding progress. Their focus is on the iterative process of responding to market feedback rather than being committed to a fixed path or technology. *"But at a certain point, you also realize that the [customer segment 1] are not making any progress at all. So, then we decide to focus more on [customer segment 2], and you let go of a whole bunch of other things, and you continue with that. That is all part of the process."* (E1). *"So you have to be very flexible when you are a startup, especially when it comes to a high-tech company like what we do."* (E6). This approach thus also included **accepting/gathering & incorporating unforeseen customer feedback**, which reflects the process of actively seeking out, listening to, and integrating customer feedback into product development and business strategy. This practice seemed crucial for startups, especially when assumptions about customer needs or product performance are challenged by real-world use. *"Listened again. Processed all the feedback. Sent the product back to him again. And we did that through a number of iterations."* (E7). It seemed through the answers of the incubator managers that this behavior is encouraged in the incubation process, especially in the early phases. *"I really need to get out there. Do I want to achieve something? Instead of just staying in your bubble. There are people who are very creative, who often get stuck in that. But in the end, you only find out the potential it has when you actually start doing it. It might be that a program is needed. Some people are very independent. Maybe stubborn, they first go exploring on their own. All fine, as long as they really start taking steps."* (M2). In the moments when there were plans in place, entrepreneurs did not shy away from **adapting plans to accommodate unforeseen events**. This explains the ability and willingness to pivot and modify initial plans when faced with unexpected challenges and/or opportunities. An important thing to note is that the entrepreneurs mentioning this were already executing their plans. *"We had been building the whole thing for almost a year, and nobody could do it. Yeah. Then I simply made the choice, I saw that hand tracking was being released. It was super experimental at that time. No idea if it would work well enough. I thought those controllers, that's definitely not going to be it. We had previously thought, well, everyone can do that. Turns out that's not the case, so then you have to switch."* (E7). **Actively exposing the company to outside influences** was a core attitude of the respondents. Their approach to engaging openly and opportunistically with various external stakeholders consisted of actively pitching the startup to attract potential customers or partners. It shows an open, accessible, and proactive stance towards seeking opportunities. It also emerged as an explorative and opportunistic tactic during challenging times, for example during the COVID-19 pandemic. *"So sometimes things are tough, or there's a crisis, or you have a few weeks where you're not quite sure how things will go. But yes, our core principles, we are open, we are very approachable, and we talk to everyone. So, then you just start talking to more people and then you find out that maybe doors open elsewhere. So, you just have to stay opportunistic and keep looking."* (E4). To exploit opportunities that arise in response to this opportunistic attitude in combination with the uncertain environment, respondents indicate **embracing unforeseen developments and opportunities**. It

displays in not only coping with but actively leveraging contingencies that hold opportunities. This behavior is not characteristic of a single phase but is used throughout the journey when these events occur. *"The corona situation was quite positive for us, or at least to some extent, because it meant that many people started working from home. And so, in this field too. [explaining the situation] During the corona period, we quickly developed [feature] We developed this very quickly at the start of the corona period and integrated it into the software. And that was immediately very well received. So, we seized a good opportunity that came up specifically during corona."* (E2).

Commitments and self-selected partnerships emerge as the fourth key theme in effectual decision-making. Analysis of the transcripts reveals their importance, as they are frequently referenced in various contexts. Partnerships, in all forms, play a crucial role in their journey highlighting the significance of stakeholder collaboration and the value placed on actionable external insights. Entrepreneurs from the sample all, at one point in their journey, joined the incubator to seek advice, secure working space, receive mentoring, and tap into additional resources. Typically, **seeking guidance from an incubator** unfolded organically through referrals from acquaintances such as friends or teachers knowledgeable about the incubator's resources. *"They have an idea, and through friends or teachers, they've heard that there's a place like us that can help them determine those steps, to guide them in that process."* (M2). Entrepreneurs approach the incubator in the pre-startup and startup phases when they have a business idea and need help to take the next steps. It shows an acknowledgment of the entrepreneurs' gaps in experience or knowledge. This sometimes even happens in the idea phase. In that case, the business idea originates within the incubator. *"And then with that idea, we just started asking around, including a visit to Novel T."* (E4). *"But most people still come in with 'I have a business idea somewhere and it keeps staying in my head. I now really want to take the next step.' That's the moment they get in touch with us."* (M2). *"At the same time, we are also looking for entrepreneurial types who are like: 'I would like to do something with entrepreneurship, but I don't have a precise idea yet' or 'I already have an idea, but I need help with it'. We try to recruit them as well."* (M1). In the idea and pre-startup phase primarily, entrepreneurs actively were **engaging with potential clients to identify opportunities**. This shows a proactive approach in which the founders directly interact with potential clients through brainstorming sessions, interviews, and informal discussions to explore and understand their challenges and needs for opportunity recognition. Incubator managers also encourage this approach through their programs and coaching. *"I used my background from the university, so I decided to conduct interviews with [potential customers] to see where the problems were. That's how I got in touch with about 60. Conducting interviews, listening to where the problems were, and starting to think."* (E7). On top of this, entrepreneurs were also actively **exposing MVP to potential clients early on**. They presented their Minimum Viable Product (MVP) to potential clients at the pre-startup and startup phases to validate demand, interest, and practical use. This allowed for immediate feedback and verification of their offers' relevance and potential for the market. It recognizes that the MVP is not yet complete but uses this stage as an opportunity to create momentum and refine the product based on real-world customer input. *"from a question, actually create an initial MVP, as it's called, to then circle back to the client to ask if this is somewhat what you're looking for?"* (E1). *"What we do is when we have something ready, for example, we have an MVP of that thing, then we go directly to customers and test if what we think is true. And then we probably find out that it isn't."* (E7). Not only validating but **co-creating business with customers** was another displayed approach frequently mentioned. They referred to developing a business or product in collaboration with customers in the startup and post-startup phases, integrating their feedback, needs, and ideas into the creation process. This then ensures them towards a more tailored and market-fit offer as the output is more likely to align with actual customer needs, problems, wishes, and overall requirements. *"You're building things for a [customer segment x]. And that [x] takes out the phone with your app from his pocket. So, what needs to happen? You have to talk to that [x]. Not with the purchasing department of the [organization] or whatever. So, we get in that little car, drive to the [organization], and talk to that [x] who takes our app out of his pocket. Because that's when we get the real feedback. That's how we operate. Ultimately, it's people who do things for people."* (E4). Next to customers, founders were also **engaging with stakeholders to create and pursue opportunities**

together. This behavior refers to interacting with various market players, such as potential partners, and industry experts, to exploit opportunities together. The entrepreneurs created an environment in which stakeholders, recognizing the potential value of the startup, actively self-selected to participate in the process. This engagement involved presenting ideas, gathering feedback, and building relationships that led to new partnerships, co-founders, client relationships, and the co-creation of products or services. "Look, it's just nice to have people around you, to have partners around you, to have collaborations around you. And also, collaborations that can get you in somewhere." (E3). **Co-creating business with stakeholders** captures how these opportunities are exploited. Here, founders actively and synergistically involved stakeholders in the development of their business or product. The process is not just about selling a concept, but about shaping it through collective input in the *startup phase*, which can lead to more innovative and sustainable results. "clinical people, technical people working together with good feedback on the very smallest details, even if it concerns a delivery that has to be done within a weekend instead of during the week, or whatever, where the package has to go, all the way to your production process and the service you will eventually provide" (E6). **Trust-based flexible stakeholder agreements and commitments** are what lie at the heart of these partnership interactions. Relationships and partnerships are often based more on trust than on formal contracts. These relationships are characterized by mutual understanding, flexibility, and a shared vision of the future, often making collaboration faster, more flexible, and adaptive. The founders rely on the goodwill and enthusiasm of stakeholders who see potential in their ventures. "a client who says: 'Look, do you guys want to conduct a feasibility study or preliminary research? You know a lot about technology. I know a lot about education, agriculture, energy, you name it. Shall we just see in a project of two or three months if we can bring those two things together?'' Well, and that is actually more like paid market research. Because then we will explain how that technology works, and we get paid for that." (E4).

Table 3 Data structure 1/5

<i>Ist-order concepts</i>	<i>2nd-order themes</i>	<i>Aggregate dimension</i>
Spotting an opportunity based on their own existing knowledge and experience	Means driven action	Effectual decision-making
Using their knowledge base to make decisions		
Leveraging existing skills and resources at hand		
Defining only rough visions while leaving the details open		
Leveraging existing networks for opportunity creation & identification		
Following personal principles and preferences		
Being willing to make affordable personal sacrifices	Affordable loss	
Deferred financial expectations		
Investing limited, small amounts of money, time, and effort		
Finding unused resources in the local environment		
Limiting stakeholders' commitments to levels that are uncritical to them		
Strategic flexibility in response to market uncertainty	Leveraging contingencies	

Accepting/gathering & incorporating unforeseen customer feedback		Commitments and self-selected partnerships
Adapting plans to accommodate unforeseen events		
Actively exposing the company to outside influences		
Embracing unforeseen developments and opportunities		
Seeking guidance from an incubator		
Engaging with potential clients to identify opportunities		
Exposing MVP to potential clients early on		
Co-creating business with customers		
Engaging with stakeholders to create and pursue opportunities together		
Co-creating business with stakeholders		
Trust-based flexible stakeholder agreements and commitments		

4.2 Causal decision-making

Goal driven action is the first of the three causation-based themes identified through the interviews. It relates to the basis for taking action. **Defining a clear direction and emphasizing its need** emerged from the data as an important facet of their entrepreneurial decision-making. It indicates the importance of having a set goal or vision when starting and developing a new venture. It usually took the form of a 'dot on the horizon'. Entrepreneurs expressed an understanding of where they were heading and what they intended to achieve, indicating a guided approach to their startup's direction. *"You need to have a goal. You can't just start something haphazardly. No, we knew which direction we were going. We want to be a service that has in-house technology."* (E6). Some entrepreneurs indicated that decisions in the *idea and pre-startup* phases were guided by rough predictions of the future, mostly based on overarching industry trends. **Basing actions upon expectations and predictions** reflects the forward-thinking approach of entrepreneurs who plan their actions based on their visions for the future. Primarily the Independent Private Incubator facilitated this approach as they organized KIK's (Knowledge & Innovation Circles), a brainstorming format developed by the incubator to think about new business models through predictive scenarios with a large group of, up to about 20, multidisciplinary professionals. This approach aims to align their current direction (dot on the horizon) with expected future realities and position their companies favorably by identifying potential scenarios to make informed decisions about the direction of their startups. *"We would sit down with young people and together we would think about what the world will look like in 20 years. [...] What would you need to do in the next 3, 5, 10 years to gradually start preparing for that new reality?"* (E4). **Defining and pursuing specific project goals, product, customer needs, or market goals** indicates the entrepreneurial focus on clear and actionable targets displayed in the *startup and post-startup* phases. Respondents reported having established commercial goals and strategies to raise investment capital and inform expansion projects. They prioritized thinking through patterns behind their go-to-market or communication strategies. While seeing the value in more structured planned approaches for operational aspects, founders still emphasize the need to maintain flexibility. *"Yes, so I've developed a strategy for that. What's very important is that you never talk to just one investor at a time. So what you want [] And that's how we eventually get the best investors on board. With a better deal. That's a perfect picture of how you want to do it. That's how I plan it now. I don't know if it's going to work, but that's how I plan*

it.” (E7). This is enabled and supported by the incubator programs. *“But he struggles to grow or to develop a strategy that makes them scalable. That is certainly a pillar that we address.”* (M1). Founders were **searching and selecting partners based on predefined plans**. It describes a more strategic approach founders took in building their networks and relations. They actively sought out customers and partners that align with their company's goals and growth trajectory. This process involves a combination of research, networking, and leveraging existing connections to form partnerships that can support sustainable business growth. Entrepreneurs recognize the importance of strategic alliances, especially when scaling up their operations in the post-startup phases. *“So, we are now really looking at which larger, long-term projects with strategic partners we should undertake to achieve sustainable growth for the future. Growth costs a lot of money, so that means you need to find strategic assignments, partners, and things to prepare for that.”* (E4). Founders indicated they were **defining and satisfying organizational needs**, especially in the later startup and post-startup phases. Entrepreneurs identify, prioritize, and address the internal requirements of their startups. This involves expanding teams, developing new products, securing a stable cash flow, and ensuring the continuous growth of the company. Entrepreneurs take calculated steps to hire new talent, increase technical capacity, and establish a solid foundation for sustainable business growth. This behavior was almost exclusively present in later development phases. *“And in 2021 things really took off. That year, I believe we hired about 10 new people. A number of developers and especially a good number of consultants. 2022 went really fast as well, and so far, 2023 is also going very fast. So we now have about 25 people, I think, of which about half are developers and the other half are consultants. And then we also have someone for marketing and an Office Manager.”* (E2). *“And only then, do you get to issues like; ‘wait to have an even bigger audience, we indeed need to start working with a logo, a website, a professionalization effort.’”* (M2). While some entrepreneurs never constructed one, others were **developing an extensive business plan**. Important to note is that these were from startups that were required to communicate these business plans by investors or grant providers. While these entrepreneurs go through the process of drafting detailed business plans, they recognize the limited practical value of such plans due to the unpredictable nature of business. They further see, aligning with the views of the incubator managers, tools like the Business Model Canvas (BMC) only as a means, rather than ends. They suggest that while it's important to articulate ideas on paper and to share these with others, entrepreneurs should not become fixated on these documents to the point where they inhibit action.

Market research and competitive analysis is the second identified causation-related theme. It focuses on the founder's attitude towards outsiders. As the founders recognize and acknowledge the unpredictability and the newness of the market, there is little room for analysis. However, in the pre-startup phase, informing their decision on whether or not to pursue their business idea, the founders were **carrying out non-systematic competitor and competitive positioning analysis**. Entrepreneurs indicated that during this phase, among other things, they wanted to understand their competition and market positioning, using a method that was mostly non-rigid and informal. They focused on key differentiators, and identifying unique selling points rather than conducting a detailed, systematic analysis. *“At the beginning, we looked closely at what our competitors were doing. But I didn't necessarily do a real analysis. We just wrote down, okay, what do they do well, what do they do wrong? What do we think we can do better? How can we make it more scalable than our competitor? And what can our unique selling points be compared to them? That's what we did.”* (E7). *“And we had mapped out a bit who else was doing it, approximately. Not very extensively, there was little to find about it at the time.”* (E6). Also mostly in the pre-startup phase, they were **carrying out market research** to assess the viability and potential of their business idea within the market. Again, mostly non-systemic but not exclusively. It involves determining the market size, understanding the industry, and identifying customer segments. *“So initially, I wanted to confirm that this is a solid business case, not necessarily about validating it, but just to understand what's available out there. Conduct some market research.”* (E5). *“Yeah, but yeah also market analysis things like this it helped in terms of broad, giving us a green light to where we're going.”* (E8). An approach of extensive market research and preparation, aligning with causation, seemed to be discouraged by the incubator managers. One manager expressed a

preference for moving beyond theoretical analysis to taking action. *"I think that we are trying to explain to the causation group and show them that this way of working, when you really have nothing and can't make use of anything, just doesn't get you very far. Those are the people who will spend weeks conducting market analyses, reading reports, and scrutinizing everything. And at some point, they indeed know quite a lot. But not enough to actually do something with it."* (M3). One entrepreneur was actively **acquiring resources through market contract-based agreements**. It could be seen as an outlier in this study's data, but because industry regulations partially forced this entrepreneur to exhibit this behavior, it could be exemplary of other startups in similar regulatory environments. It involved identifying their specific needs and then establishing partnerships to acquire these resources. Such arrangements could be essential for startups that might lack certain necessary competencies or resources internally but can acquire them through market-based contracts or partnerships. *"so, the company that builds the robot arm because they are the robotic arm manufacturer they supply the robot arm to us [] And the interesting thing is, initially we didn't have this arm. It was an arm of another company. But that arm was not medically certified. And this one holds the only certification in the world on a robot arm that can be used in the OR."* (E5).

Expected returns is the emerged causation theme which focuses on the founders' view on risks and resources. This behavior involves the focus on the anticipated outcomes or benefits that participants expect as a result of their entrepreneurial actions or decisions. It reflects a forward-looking perspective towards potential future financial gains. In the pre-startup phase, respondents indicated **analyzing financial viability** which recognizes the necessity of evaluating revenue models and anticipated returns while also understanding the inherent uncertainties in such early-stage projections. Founders use these financial assessments as a compass to decide whether to proceed with their ventures, typically using an informal and non-systematic methodology for such evaluations. *"I did make some forecasts, but I am very much convinced, and that's me, that forecasts are basically just nonsense. You put it on paper and in the end, the reality is always different. I think it's very difficult as a startup to estimate what you're going to earn. But we did calculate, for example, these are our subscription costs if we bring in so many sales. We did make some kind of estimate. We really had an Excel file. We calculated it well, only looking back now, none of it is accurate."* (E7). When having plans in place, mostly in the startup and post-startup phases, an obvious next step is **searching for stakeholders to commit the amounts necessary for the execution of the plan**. Respondents show strategic efforts in securing financial resources essential for their startups' growth. Entrepreneurs highlighted the importance of being prepared with data and a feasible plan before approaching investors. *"So, then I was forced to look into those aspects because the follow-up is, of course, an investment. We can't go to investors unless we have that data."* (E5). **Calculating expected financial outcomes/returns** is what entrepreneurs did in the startup and post-startup phases as well. It reflects the practice of evaluating the potential financial impact of business decisions, such as hiring staff, investing in growth, or applying for funding. This systematic and analytical approach is essential for balancing growth aspirations with financial sustainability, ensuring that investments and resource allocations are aligned with expected returns. Next to this, investors, lenders, and grant providers also required forecasts of expected returns. *"So, if you can earn some euros from a client, but it costs you an incredible amount of time. You see, having staff also costs money. Therefore, you can create a very clear internal overview of what my cost per hour is. And how much time do I expect to invest in something and what will I earn from it? [] that's more or less how we started to approach it, say, in the third or fourth year."* (E4). Similarly, an incubator manager highlighted the necessity of professionalizing business practices as the venture grows. *"Yes, then you also have to professionalize a bit, add a bit of the 'blue side' to your business, right? KPIs, how is your work inventory doing, how's the pipeline, your potential market turnover. Then you also have to aim for, well, we have a clear goal, and we're going to break it down into a strategy because at a certain point you already have certain resources and then you really want to deploy that growth. So, I think we're sitting more towards that causation, I think that's a logical consequence for us."* (M1).

Table 4 Data structure 2/5

<i>Ist-order concepts</i>	<i>2nd-order themes</i>	<i>Aggregate dimension</i>
Defining a clear direction and emphasizing its need	Goal driven action	Causal decision-making
Basing actions upon expectations and predictions		
Defining and pursuing specific project goals, product, customer needs, or market goals		
Searching and selecting partners based on predefined plans		
Defining and satisfying organizational needs		
Developing an extensive business plan		
Carrying out non-systematic competitor and competitive positioning analysis	Market research and competitive analysis	
Carrying out market research		
Acquiring resources through market contract-based agreements		
Analyzing financial viability	Expected returns	
Searching for stakeholders to commit the amounts necessary for the execution of the plan		
Calculating expected financial outcomes/returns		

4.3 External conditions

The entrepreneurs all mentioned and described the *high perceived environmental uncertainty* throughout their entrepreneurial journey. The startups either entered a new market with existing technology or introduced new technology to an existing market. Incubator managers also stated that one of their selection criteria is to focus on scalable innovative startups while avoiding existing technologies in established markets. They prefer startups that bring business model innovation or new technology applications. Founders frequently described **the unpredictability of the future and the difficulty of planning**. The entrepreneurs acknowledged the difficulty and limited value of accurately predicting and planning for the future of their startups. They emphasized that, sometimes despite initial attempts at forecasting and making plans, reality often deviates significantly. This unpredictability in factors like market conditions, partnerships, funding, and government subsidies makes long-term planning difficult and sometimes even futile. "So, the thing is we all know it's bullshit right like whatever you plan, it will never pan out that way. It will never be exactly as what you planned even your finances. Like whatever you think your expenses would be it will change. Like hundred percent right otherwise anyone can do it." (E5). Also, incubator managers highlighted their skepticism towards the reliability of long-term planning in such volatile environments." Because even if your plan is so good, it only takes one thing to happen, and then the rest of your plan can go straight into the bin, and then you've actually spent a lot of time creating and documenting something." (M2). "Because causation entrepreneurs start with a business plan. And they figure it out, and they search for all kinds of things and come up with a sort of assumption. But what you notice in the startup world is that the assumption you make and the work that you put into such a business plan can often go straight into the bin as soon as you step outside and talk to the market even once." (M3). The entrepreneurs furthermore mentioned encountering **unforeseen**

challenges and surprises and acknowledged that they can arise at any time. Frequently mentioned was the Covid-19 pandemic. These contingencies often disrupt their strategic direction and force them to adapt and respond to changing circumstances. It highlights the need for flexibility and the ability to handle unexpected situations in entrepreneurship. *"And entrepreneurship sounds really exciting at the front end. Until you start. Yes, those moments come when you think, 'What the heck is happening here?' It's not what I expected. And then you have to react and solve the problem. Just like solving customer problems, you also have to extinguish fires internally. Because there are just so many things that you cannot predict in advance."* (E7).

Perceiving a high level of uncertainty in the environment is common during the early stages of a startup's development. However, this perception tends to diminish as time progresses, and specific milestones or internal factors can contribute to a ***lower perceived environmental uncertainty***. It is intentionally formulated as "lower" rather than "low" because a high level of uncertainty appears to be the initial or baseline perception. One important factor signaling this lower perceived environmental uncertainty is **validation/traction from customers**. It represents the recurring mentions of entrepreneurs seeking and viewing validation and traction from customers as a crucial milestone in their startup journeys. It emphasizes the importance of having real customers interested in and using their products or services to validate their ideas and business models. *"And one of the biggest requirements is actually which product has a customer first."* (E2) *"No, we did have a lot of traction. So, we had a full funnel. And we knew that many parties wanted to join us."* (E7). **Growth signals & generating revenue** are another factor, which involves achieving steady revenue streams, gaining customers, and seeing positive financial results as indicators of progress and confirmation of heading in the right direction. *"So, we said, 'Let's give it a year,' but then, 12 months later, we had such a nice revenue, great customers, and exciting things that we could even hire someone. So that was a signal for us: 'Well, you should keep going.' And that's how it has been up to this day."* (E4). *"The follow-up phase, that's exactly aligned with it. So now you're talking about the post-startup phase, so by then you should have proof that there is something that can really scale, and you've been able to run tests, do a pilot or a demo or whatever, and maybe even have your first customer. And then comes the point, okay, now you suddenly have to build a serious organization around it."* (M3).

In addition to perceived uncertainty, ***stakeholder pressure*** is part of the external conditions. First, respondents indicated the pressure of **investors and grant providers demanding business plans**. Founders often mentioned being in situations where investors or grant providers demand comprehensive business plans and financial projections as part of the funding application process. These documents serve as a way for investors, grant providers, and lenders to assess the risks and numbers associated with their financial commitments. *"But then eventually when I had to apply for funding, I had to make a very complex, like five, six pages. It took a lot of time. Every month, every single cent that would be spent."* (E8). Also, one MedTech entrepreneur mentioned the **influence of policymakers** on their trajectory. It highlights the impact of government regulations and policies on entrepreneurial ventures, particularly in industries with strict requirements. Entrepreneurs in certain industries need to navigate complex regulatory pathways and comply with specific standards to develop and market their products successfully. This can lead to a more forced causation approach in navigating this regulatory environment. *"that shaped how we defined what our product should be used for in hospitals one day because you have to have what is called an intended use. You can't have, like, a stethoscope and tell the surgeon, 'Well, you can use it for anything you want' because then they'll just, you know, do something stupid, and then there's a liability."* (E5). In other cases, especially when the incubator participates in the startup, respondents mentioned an **influence on decisions by the incubator**. In some cases, their involvement can shape key decisions related to funding, structure, and focus areas. Sometimes delays in legal processes occur because of financial incubator involvement. *"Oh, that one is quite significant, and indeed, it's something I've referred to several times in this interview. Its influence is quite significant, especially since his son is also involved in the company."* (E1). *"Because with a spin-off, if the university doesn't see the value in your technology chances are they would not necessarily agree to spin you off"*

right.” (E5). The manager from the IPI highlighted that their stake in the startups drives them to be actively involved in building the startup alongside the entrepreneur. It however does not point towards either effectuation or causation. *“In these startups, you usually see steady, linear growth in the first five years. But over time, traction occurs and exponential growth begins. We have a long-term horizon, and because we have a stake in the startup, this motivates us as an incubator to run and build the startup as hard as the entrepreneur. We actively engage because we have an interest in the growth of the startups. But because our horizon is relatively long, we don't focus on short-term returns, but more on equity.”* (M1).

Table 5 Data structure 3/5

<i>Ist-order concepts</i>	<i>2nd-order themes</i>	<i>Aggregate dimension</i>
The unpredictability of the future and the difficulty of planning	High perceived environmental uncertainty	External conditions
Unforeseen challenges and surprises		
Validation/traction from customers	Lower perceived environmental uncertainty	
Growth signals & generating revenue		
Investors and grant providers demanding business plans	Stakeholder pressure	
Influence of policymakers		
Influence on decisions by the incubator		

4.4 Internal conditions

An important internal factor affecting entrepreneurial decision-making is a startup's ***financial resource position***. Almost always present in the earlier *idea & pre-startup phases*, a **low financial resource position** captures the common startup situation where entrepreneurs find themselves with insufficient (personal) financial resources to cover operational costs and growth initiatives. Respondents mentioned that this forced them towards cost-based decision-making and dependence on external subsidies or personal savings to support their ventures. It reflects the inherent financial constraints that define the early phases of startups, influencing their strategic and operational choices. *“At the beginning, it's very difficult because initially, you don't have any money, but I also worked for an entire year for absolutely nothing.”* (E7). *“It's often students who come here. Sometimes people from the workforce also come in. But how many? About 80% are students, so to speak. The living situations can vary. But generally, the image of a student... They don't have money, but they do have time. They also have the energy to figure things out.”* (M2). After generating revenue, or even receiving funding, this position shifts towards a **high financial resource position**. This condition indicates an internal state in which startups have enough financial resources to support their operations and growth ambitions. This position enables startups to invest in their development. Respondents said it helped them define and meet their organizational needs. It enables a more aggressive growth strategy, allowing for the hiring of additional staff and the pursuit of opportunities that would be unattainable with a lower financial reserve. Furthermore, this financial stability serves as a buffer for the company, allowing for greater flexibility in timing and strategic decisions. *“The advantage now is that you can do that with your own resources instead of at the very beginning. [] Now, of course, as a company, you're bigger, you have a bit more of a buffer, so it doesn't matter so much if something comes a bit earlier or a bit later.”* (E4).

Another important internal element of the startup and its founders during the entrepreneurial journey is

knowledge assets. A founder's **educational & entrepreneurial background** often shapes their entrepreneurial decision-making. It dominates during the *idea phase* because it is almost always the foundation from which the initial business idea emerges. It represents the knowledge entrepreneurs have gained in various academic disciplines and self-starting endeavors that they use in their current startups. *"So I had already been busy with web development for seven years, just to earn something in the evenings instead of working at the supermarket. So, I already had some experience with finding clients and certainly with building software."* (E4). Managers of incubators further mentioned that a founder's background can also hinder them in some cases. Engineering students tend to be highly structured and technically focused, sometimes to the point of extensively developing a product before going to market. This can lead to misalignment with market needs. Business students, on the other hand, may lack the drive to actively engage with the market and often stay within theory. They understand the importance of the market but may lack the initiative to go out and validate their ideas. *"What we then see with technical students is that they work very structured and plan-based, with technology as the priority. A common pitfall for these students is that they have an idea, spend a lot of time making the first version of a product, and then go out to the market to ask, 'I have made this product with these features; you must have this.' They then reach the point where they realize, 'Yes, nice, but all these features can be removed; these are our problems.' And with business students, the drive to really go out is often lacking. I have experienced this myself during my studies; the theories are all well and good, but nobody really tells you, 'Okay, you have this idea, do something with it, really go outside.' It often remains theoretical, as I've noticed at the university."* (M2). Respondents also indicated having a **lack of (business) knowledge** which involved the common challenge many entrepreneurs face due to a deficiency in formal business education or practical business experience. This was said by entrepreneurs with a technical background, but also entrepreneurs with a business education indicated still missing practical business knowledge useful in a startup environment. Entrepreneurs acknowledge this shortfall as they encounter the complexities of business operations, including financial management, taxation, and corporate structuring. Acknowledging this deficiency, many entrepreneurs turned to incubators for guidance, while further emphasizing the importance of seeking feedback and learning from others in the entrepreneurial journey. *"Yes, but you also need that. I'm an engineer, I have no idea how that works."* (E6). *"Because many of us here, we have no business experience, right?"* (E5). The managers expressed welcoming these aspiring entrepreneurs, mentioning no explicit selection requirements. *"People are really searching for where to start: 'Hey, where should I begin first? I have an idea somewhere, but then what, what should I do?' And that's where we actually help give direction."* (M1). *"I think many entrepreneurs come in here initially with 'this is my idea, this is what we want to do.' But they actually have no clue about all that is involved, especially in the beginning phase, to reach a certain goal or to even start realizing the idea."* (M2). *"Almost all entrepreneurs are first-time founders, those who are setting up a business for the first time. So, they are always dealing with people who don't know very much yet. And that's okay, because that's what we are here for."* (M3). Another way founders indicated addressing this issue was through **external knowledge acquisition**. Respondents indicated actively seeking out information from various external sources to help guide their decisions and supplement their entrepreneurial knowledge. This learning strategy involves absorbing narratives and biographies of other entrepreneurs, accessing online resources like Y Combinator articles, and reading books to piece together a coherent understanding of operating a startup. *"There are a few books that I have read. But they are more like narrative books. So, those are books about other entrepreneurs and how they approached things, biographies. I find that interesting, but I would never copy anything one-to-one. So I read multiple sources, I read online articles from Y Combinator, books, and materials. And then I try to form a kind of picture of how it could go this way or that way."* (E4). The managers also seem to get inspiration from current developments in the global startup world. *"Yes, actually from the startup idea already, so the program and the programs within Novel T are set up from the philosophy of how others do it, for example, the Y Combinators, we just looked at the best-performing programs worldwide, at the theories that have been applied to them, and started thinking hey, what themes do we need to have."* (M2). The capacity of a startup to use its data and expertise for decision-making depends on the **availability of internal data & knowledge** acquired through internal operations and client engagements

in the *startup and post-startup phases*. Respondents emphasized the value of operational knowledge and the knowledge of market demands, which can prevent ventures from pursuing unviable projects. This internal element can enable growth forecasting, strategic decision-making, and justifying higher investment requests based on de-risked business models. *“We know that what we turned over last year, we will turn over at least the same this year. We also know that we always grow by only a certain percentage.”* (E3). *Ultimately, you will become more and more specialized and find a niche in which you will be active at the beginning. The more niche you become, the better you can plan ahead to really achieve that goal. So, from an effectuation perspective, you gradually move towards causation. The goal you could achieve becomes sharper as you mature.* (M2).

Pilot in the Plane as an internal element is derived from effectuation theory and underscores the proactive role of entrepreneurs in forging their future through deliberate actions and decisions. This concept stands in opposition to being passively influenced by external circumstances. Instead, it highlights the entrepreneur's agency in steering the course of their venture and shaping their future outcomes. Where their entrepreneurial plane is heading, is based on **aspirations of their entrepreneurial future & impact**. Respondents frequently mentioned defining long-term visions and understanding the potential broader impact of their work. While acknowledging that the path to achieving these visions and aspirations might be unpredictable, it remains relatively consistent and serves as their guiding star. It is mostly formulated during the *idea and pre-startup phase* but can be updated and refined throughout further phases. The respondents seem to demonstrate a commitment to creating meaningful change, whether in technology, societal impact, or commercial success. *“Because if you want to see a direct impact on society, it's only through commercialization efforts that you would actually see them end up using your technologies, whereas with academia it stays in its own little niche.”* (E5). *“I definitely saw that it is something that has to happen. Because, it might make a huge impact here in terms of people's lives because all the people can make money from something they love to do. And they'd much rather do that themselves, make a lot more money than they would do working at the restaurant.”* (E8). The next step is to commit to the journey through **proactive commitment & ownership**. Respondents indicated taking responsibility and ownership and being proactive throughout the process. They suggest true entrepreneurship goes beyond mere participation or being in a position of leadership; it is about taking charge and being fully committed to their startup. It's not enough to have resources and opportunities available; entrepreneurs must actively seek out what they need, identify gaps in their knowledge or business model, and pursue solutions with full commitment. This was also related to the guidance and advice received through the incubator, as respondents emphasized that it is up to the entrepreneur to ask for and utilize everything useful within the incubator. *“we have the saying in Afrikaans and probably in English as well, but ‘You can bring the horse to the to the to the well, but you can't force it to drink’”* (E5). *“If you're an entrepreneur, it's not like you're doing a school assignment. It's really for your life. You're doing it to make money. A better word is, it's your passion. So that also means that if you hear something that helps, you immediately do it. It's not like they have to push you.”* (E6). *“Real entrepreneurs don't get slowed down. They just keep going. In my eyes, you're not a real entrepreneur then. You just have to do it in the end.”* (E7). The managers also mentioned this, emphasizing the importance of a proactive attitude and the need to demonstrate ownership. *“From mistakes, you learn, and by applying that here—by saying, we give them the freedom and the trust—we eventually get that entrepreneurial, proactive self-regulation behavior from the entrepreneurs in return. Okay. And where we do have something: we look very much at ‘Who is the person?’ and to what extent... is that person naturally already working in that way.”* (M1). *“Yes, the beauty of the incubator here is that the individuals who are here must really do it themselves. So, you can compare us to a pit crew team, for example in Formula 1. So, we have a team in the background with all kinds of experts, expertise, and experiences. But the one who is the entrepreneur is like the driver in the car. So, you can have a great team in the background, but ultimately they drive their own course and own laps. And it's up to them whether they make use of it or not. That's how we work here in the incubator. So, you have people, you can facilitate them in many ways, but we don't mandate anything.”* (M2). After commitment, the focus shifts to the speed of execution and maintaining momentum. The respondent's **ambition for**

speed and momentum emphasizes the importance of moving quickly to build and iterate on product ideas, maintaining a fast pace in product development, and decisively acting to preserve momentum. Founders reflect an understanding that speed is crucial in a startup environment where market dynamics are volatile, and opportunities must be seized quickly. *"So what we did then was to see which one is the most feasible in terms of time and cost and because we want to move fast right."* (E5). *"Yes, of course, you don't want that if you want to maintain a bit of momentum with such a product."* (E2). Entrepreneurs, just as pilots improve their skills with every flight, indicate that they learn from each action they take. **Learning by doing** is a hands-on approach to problem-solving which respondents emphasized. It implies that theoretical knowledge alone is insufficient; real-world practice and learning from mistakes are essential for understanding and improving business practices. *"The most important thing in the startup phase is execution. So just try, fall flat on your face, learn from it, and then you'll know how it should be done. Instead of thinking for 30 days about how it could possibly be. No, build an MVP, build a crappy version of the thing you want as quickly as possible. Throw it over the fence to your customer and then you'll hear whether it's good or not, or where it needs to go."* (E7).

The **personal attitudes and perspectives** of the entrepreneurs seemed to be an important internal condition for mapping the context of entrepreneurial decision-making within incubators as it impacted their ability to navigate the complex, uncertain, and often challenging entrepreneurial journey. *"But, well, the idea is one thing, but the person in question is what matters most to us. We look at to what extent the person has the potential or already has a proactive attitude and is open to generating new ideas, is curious, inquisitive, and has a certain degree of courage and boldness. So, you could say, to what extent is that person stubborn enough to explore new directions, to experiment, that does give us some clarity about the entrepreneur. So, for us, we mainly look at who we have in front of us."* (M1). Some respondents indicated being **curiosity-driven** which often is the spark that ignites the desire to seek out new knowledge and understand certain aspects of their startup trajectory. Respondents reflect a proactive approach towards self-education and pleasure in acquiring new information, either about their industry or entrepreneurial knowledge. *"So that we delve into what is happening in the market. That has always been in us. But that also comes from a certain curiosity."* (E4). Being **action-oriented** is how the interviewees translated ideas into concrete actions. This attitude emphasizes the entrepreneur's propensity to take initiative, make decisions, and act upon opportunities. This is important for entrepreneurship as actual business outcomes are derived from real-world actions. It also captures the essence of learning by doing, highlighting that success in entrepreneurship often comes from hands-on experience and the willingness to take risks and learn from failures. Furthermore, it suggests that intuition and a straightforward, common-sense approach can be as valuable as formal analyses in driving startups forward. *"Yes, how hard can it be? You just have to do it,"* (E6). *"Less talk, more action"* (E3). This behavior is enabled and encouraged by the incubator managers. *"And if you keep dwelling too much on that business idea, you won't get business operations out of it, right? Ultimately, you also have to take action, and thinking is good, but doing it better."* (M1). *"In the ideation phase, it's mainly a conversation partner, I think at a higher level, who is on an equal level with them. Or maybe even a level higher. Someone who doesn't tell them what to do but also inspires them to actually do it. More about prompting actions, rather than endlessly talking, thinking, and staying creative."* (M2). Attitudes that help initiate action and sustain the entrepreneur through their journey are **entrepreneurial confidence & optimism**. Respondents reflect a self-assured belief in their ability to accomplish tasks and succeed, often despite lacking previous experience. *"You know, we've never done that before, so we can probably do it. [] Let's go, what could go wrong?"* (E3). **Resilience and adaptability** are the attitudes that enable entrepreneurs to navigate through the ups and downs of their startup. It reflects the entrepreneurs' capacity to endure setbacks and persistently pursue their long-term vision despite challenges. It involves the ability to remain patient and to seek out alternative paths and solutions when faced with obstacles. Moreover, it includes the ability to reframe losses as opportunities for greater achievements and impact. *"From the beginning of the coronavirus, we could have thought that we now have virtually no debt. We could stop now, and whatever happens then, we would have made it. But instead, we have actually continued to look very neatly and patiently each time for what you can do."*

(E3). "Then you often see the distinction between the entrepreneurial types; they either look for a new way or they start working on the idea and then we have to make changes so that it aligns with the market's desires and needs." (M2). "And in doing so, you often find that the real entrepreneurs make it through, and the ones who aren't real entrepreneurs just give up. It's too much effort. Yes, of course, it's a lot of work, that's part of it." (M3). Navigating their startups through such dynamic and uncertain environments, entrepreneurs indicated regularly experiencing **personal doubt & uncertainty**, giving a realistic perspective on the perceived entrepreneurial startup experience. Despite being confident, optimistic, and resilient, entrepreneurs also struggle with doubts and uncertainties. It involves feelings of confusion, concern, and questioning of purpose and direction. It also reflects the difficulties of maintaining team collaboration and cohesion, especially when the partnership is challenged. It also addresses the psychological aspects of entrepreneurship, like dealing with demotivation and the need to be mentally prepared for challenges. "Because halfway through the collaboration, we had a period where the collaboration was just very difficult, and we were fed up with the four of us and considered splitting up again. (E2)". "Every time we were at a certain point with our hands in our hair. Yes, what on earth are we doing? Nobody is waiting for this. What do we have to do? (E1)".

Table 6 Data structure 4/5

<i>Ist-order codes</i>	<i>2nd-order themes</i>	<i>Aggregate dimension</i>
Low financial resource position	Financial resource position	Internal conditions
High financial resource position		
Educational & entrepreneurial background	Knowledge assets	
Lack of (business) knowledge		
External knowledge acquisition		
Availability of internal data & knowledge		
Aspirations of their entrepreneurial future & impact	Pilot in the plane	
Proactive commitment & ownership		
Ambition for speed and momentum		
Learning by doing		
Curiosity-driven	Personal attitudes and perspectives	
Action-oriented		
Entrepreneurial confidence & optimism		
Resilience and adaptability		
Personal doubt & uncertainty		

4.5 Incubators' role

A frequently mentioned valuable element of the incubator was its resource accessibility. The

entrepreneurs appeared to actively use the network to which they had access via the incubator. **Access to network & expertise** encompasses the strategic advantage entrepreneurs gain through connections and know-how provided by incubators and industry collaborations. It opened doors to potential customers, collaborations, or valuable insider industry insights. On top of that, the incubators give the entrepreneurs a ‘stage’ by providing access to certain startup events and conferences, where they can network with potential clients, collaborators, or even investors. *"They did help me by giving me a stage above all." (E7). "is this area here and the events that they host here and the networking opportunities that we get here." (E5). "Or when we say we have a network of advisors and we say we can also help with scaling." (M1). "But also, the inspiring environment and like-minded individuals, because that's something we've noticed a lot here. It doesn't matter which market you're in or what kind of idea you have. As soon as you start talking to each other and they get excited with you, and you get different insights, perspectives, and ideas, you become enthusiastic yourself and are much more willing to take that extra step. But that's my assumption." (M2).* **Access to and support with funding** is the other frequently mentioned aspect of the available resources in the incubator. It refers to the resources and opportunities that entrepreneurs receive to secure financial backing for their startups. In some cases, the incubator invested directly into the startup, which in the case of the Independent Private Incubator was always the case. In others, it helped the entrepreneurs receive funding through investors, subsidies, or grants. *"you have access to capital, as well as the critical questions that come with it" (E1).*

The incubator guides and coaches their tenants through their **incubator program**. Most entrepreneurs seem to have entered the incubator in the **pre-startup phase**, however for some, it happened in the **idea-phase**. **Idea generation within the incubator** is often a guided process in which the incubator facilitates or stimulates the conception of new business ideas. The IPI hosts brainstorming sessions and the UBI organizes challenges that push (aspiring) entrepreneurs to innovate and develop viable business ideas. *"We also come up with internal ideas together with entrepreneurs, affiliated investors, advisors, etc., where we organize brainstorming sessions." (M1).* Some of the novice entrepreneurs, with solely a technology background, have little to no knowledge about business. In this case, **learning entrepreneurial business concepts** refers to the educational aspect of incubators where novice entrepreneurs are prepared and taught practical foundational business skills. This includes knowledge about creating pitch decks, market or competitor analysis, access to capital, etc. This acts as a crash course into the startup world. *"where they teach you the basics of business, not at all yet looking at the business case, but how to pitch, how to think about the market that you want to enter, what is a competitor analysis. These types of definitions so that if you have no prior experience in business, at least you can start off as an educated entrepreneur." (E5).* One manager also highlighted the differences between what is learned in university programs and the reality of startup entrepreneurship. *"Even a business student may think they know a lot about how the business world works, but then you end up in a reality where things really go very differently. And often, especially here at the university, for example, technical business administration is done at quite high strategic levels. But starting your own company is just really down-to-earth. It's just elbows and hard work. Very pragmatic and small-scale." (M3).* Entrepreneurs indicated that in the **pre-startup phase**, the incubator guided them with **opportunity assessment & business case focus**. This reflects the incubator's role in helping entrepreneurs evaluate the potential and viability of their business ideas. The approach is primarily focused on the value that the startup will bring, validated by its customers. *"then these questions came like; what is your business case? What is the value that it brings?" (E5). "But at some point, you need a person who says, 'Okay, but what have you already done?' And often, there's that aspect of awareness in that. Do I really need to go out the door to get something done? Instead of staying in your bubble. There are people who are very creative, who tend to stay in that creativity. But ultimately, you only find out what potential it has when you actually start doing it. It may require a program for some. Some people are very stubborn. Perhaps a bit headstrong, they first embark on their own research. All fine, as long as they take real steps to see what the potential is." (M2).* While the IPI more actively supports startups in this element, **legal support** captures the essential legal guidance provided by incubators to its tenants. Think of legal decisions, shareholder agreements, patents, etc. By offering in-house expertise, incubators protect

entrepreneurs from the pitfalls of complex legal matters. *"So really, the legal aspects, setting up your payment account, the internship agreement, employees, employment conditions, general terms and conditions, all those aspects of entrepreneurship."* (M1). Overall, the respondents indicated that the **structured yet autonomous development** within the incubator program is an important characteristic. There was a balance that incubators strive to maintain between providing a guided framework for startups and allowing entrepreneurial independence. The incubators offer roadmaps and programs to help entrepreneurs guide their process, while also ensuring that entrepreneurs have a lot of freedom in shaping their journey. *"Yes, you do have to fill that out. They do say that. What's important is that you do it. Ultimately, it's up to you, of course, because they're not going to rap your knuckles if you don't do something. You also have to show some progress."* (E6). *"Others just need to conduct interviews, and others need to establish collaborations."* (M3) *"I think the mission is primarily that we believe we want to create an environment in which everyone can and wants to maintain control over their own career. In a way that you can also actively steer both your personal development and the direction of the company. Where you can see that nowadays a lot of reactive action is taken, top-down. We want to create an environment where you are actively in control, so really taking control into your own hands. [] Well, in the end, it's always up to the entrepreneur which style suits them best, I think. But from the incubator's perspective, we really use these two styles, effectuation and causation, so we don't clearly favor one over the other."* (M1). Entrepreneurs also indicated the value of **receiving actionable feedback and coaching**, which indicated the value of practical guidance and mentorship provided by incubators to entrepreneurs. The feedback and coaching included direct feedback on business strategies, technical development, and operational tactics. Incubators act as a soundboard for ideas, providing both requested and spontaneous advice. Such assistance seemed crucial for the development of the startups, as it establishes a rapid feedback loop that enables founders to learn and refine their approaches quickly. Entrepreneurs benefit from the experience of seasoned business developers and coaches who can foresee potential pitfalls. *"They have just given us a ton of coaching. And coaching for us was really all about the do's and don'ts. [...] We got that internal feedback loop from the incubator. That has helped us enormous"y.* (E4). *"Well, and then actually, yes, especially in that process where you say, what should I do at what moment to not spend two years developing in the basement or on your attic and realizing, 'Shit, there's no market demand for this, or I'm stuck. Somewhere I know what I'm doing, but at the same time, I think, what am I doing?'"* (M1). *"At some point, you notice that everyone is going their own way, but the beginning is mainly streamlining, keeping pushing. And providing feedback in the sense of asking the right questions. So not spoon-feeding what to do, but rather getting the person to think for themselves to guide them."* (M2).

The entrepreneurial business advice and guidance provided by the incubator can be labeled as **Lean Startup based education** as they predominantly focus on teaching principles of the Lean Startup methodology, a business approach developed and made popular by Eric Ries. It emphasizes the importance of short development cycles, iterative product releases, and validated learning. It's a response to the traditional way of developing products and businesses, which often involves a lot of upfront planning and development without significant customer feedback. Through it, the incubators emphasize the significance of adaptability and validated learning over planning. *"Yes, you can actually state that the entire Lean Start Up methodology is only effectuation in relation to causation. You know more about that than I do. But you often see that, I think we get an equal number of people from both groups, but you see that people from the effectuation stream are faster at getting things done. Because they are much more adaptive, and they just go for it; 'Yeah, I'll just do something, and I'll see how it goes,' in plain terms."* (M3). *"But it's mainly from the lean startup mindset of experimenting, not spending too long building and holding onto that specific goal."* (M1). *"While the most important thing remains, who is my customer, what do they want, and do we meet their needs. Once you've found that? Okay, who are the 10 others, in addition to the first customer, who have the same needs? That should be your focus."* (M2). This Lean Startup approach aligns more with effectual than causation logic and reduces the reliance on detailed business plans. First of all, there is a dominant **focus on serving the end user**. This involves prioritizing the needs and feedback of (potential) customers in the entrepreneurial process. *"But*

by now, the feedback loops for us are once again, what do customers think of us? Are they super positive? Does one customer bring another customer? I find that a beautiful expression of trust. A customer only does that when they really know us and trust us." (E4). "But it's mainly from the lean startup mindset of, 'Hey, let's experiment, don't spend too long building and hold onto that specific goal. Instead, as I mentioned, experiment and validate in the market. To repeat your product-market validation and be able to gauge and refine market needs. So, flexibility is also a part of it. So, I think the emphasis is more towards the effectuation side.'" (M1). "Because ultimately, there is only one person or people who can provide answers to whether your idea will succeed, and that is and remains the market. If you don't connect with the market, it remains an idea, a daydream, or something that sits on a bookshelf or at the bottom of a drawer. And in my opinion, that's a waste." (M2). Furthermore, the incubator teaches methods and principles of **developing MVPs and staying lean** which to the startup strategy of creating a Minimum Viable Product to test market hypotheses with minimal resources. It's a process that emphasizes the importance of agility and responsiveness in product development by allowing for low-cost experimentation and adaptation based on real customer feedback. This lean approach assists entrepreneurs in avoiding over-investment by focusing on iterative development to improve their offerings. "They helped me like they have me like realize that it's possible. And that it's not that hard and it doesn't cost a lot of money. [] And then they said, okay, why don't you even, you can just start a WhatsApp group and connect people together. It's not that big of a deal. And then we actually started doing it." (E8). There further is a dominant **validation emphasis**, primarily in the pre-startup phase. Entrepreneurs indicate that validating their business ideas with real-world data and customer feedback as advocated by incubators of their ideas is crucial. This process is integral to the lean startup methodology, where the focus is on understanding customer problems through direct interaction to ensure that the product or service being developed addresses real market needs. Incubators coach entrepreneurs through the validation phase, emphasizing that it is a critical step before proceeding with further business development. "So, what problem are you solving for whom, and how many of those people have you already made contact with and obtained a form of commitment so that you can get started? In my opinion, that's the most important thing for a starting entrepreneur. So, what do you specifically want to do for whom, and how many people have you managed to reach or have shown interest, and have you documented it in black and white." (M2). "In that second phase, which is also when you check the assessment, that's where the START program takes place, what you call opportunity assessment, which is essentially the same. [] Proof of validation. Yes. Yes, that can be different for each party. Some can work with setting up a kind of fake company to just run ads and test things in the market. Others need to conduct interviews, and others need to establish collaborations. But it's essential to have evidence of that." (M3). Incubator programs further seem to use tools and templates like the **Business Model Canvas**. This template provides a visual chart with elements describing a firm's value proposition, infrastructure, customers, and finances. Incubators often encourage the use of templates like these as they help startups to clearly articulate their business idea and value proposition. It however is approached as a means, not as a goal itself. "Product-market fit and that sort of thing, of course they all do that. Such a canvas, like a Business Model Canvas and those kinds of things, you do have to fill out." (E6). "You must be careful that the business plan or BMC (Business Model Canvas) doesn't become an end in itself, but remains a means." So, in a way, we believe in putting your ideas on paper and outlining what you aim to achieve in your mission, vision, but also in your intended business model, revenue model, which is where our expertise lies. Making that known and sharing it with others. It also helps clarify to others what you're working on and whether they see potential in it. (M1). "But it also immediately provides a good blueprint to explain to others, such as new team members in the company, potential investors, and people you're going to work with. What do you actually want to do? How do you plan to convert value into revenue and money? It's a real blueprint to communicate with." (M2). In the teachings of the incubator, there is emphasis placed on the principle and attitude of **embracing failure/contingencies & to pivot**. The incubators recognize that the entrepreneurial journey is chaotic and that failures and contingencies are part of the process, and should even be leveraged in most cases. It involves teaching the importance of a startup's resilience in facing setbacks and the ability to strategically change direction, or pivot, when necessary. It highlights the normalized perception of

failure and uncertainty in the incubator environment and underscores the importance of perseverance and adaptability for its tenants. *"Yes, yes, and I would like to add that from the campus it was very much encouraged, or actually accepted, that it is a chaotic process." (E1). "We are taught very early on to have contingencies and to pivot. Pivoting is just crucial for any startup" (E5). "That is that we want to be the gym for entrepreneurship here. So essentially, we believe you need a place where you can train, make mistakes, and practice. This is a great place to do that." (M3).*

As the external environment is highly dynamic and unpredictable, the incubator also has a significant role in providing its tenants with ***reassurance & perspective***. Both the entrepreneurs and incubator managers emphasized that each startup's journey is different and full of challenging phases. **Incubator affirmation & reassurance** reflect the support and encouragement incubators provide to entrepreneurs, particularly during these challenges. Personal support involves the reassurance that chaos and setbacks are part of the entrepreneurial process, the affirmation of the entrepreneur's efforts, and the focus on future perspectives that guide and motivate. *"Every time we reached a certain point, with our hands in our hair, thinking, 'What on earth are we doing? Nobody is waiting for this. What should we do?' he would say with his experience: 'Okay, just keep going. There is demand. Do not underestimate how many conversations you have already had. It's a chaotic process, and you go bankrupt three times a year.' He always says that, too. And 'at some point, you get a grip, and then you're ahead.'" (E1). One manager also indicated that there encouraging and motivating first time founders is a delicate process. "Because running your startup in the first four years is actually, to put it bluntly, just tough. Nothing goes as planned; it's a constant battle, a constant uphill struggle. You're just constantly busy. So, if you present someone with that during the ideation phase, they will quickly come to the conclusion that this doesn't sound like a very attractive career path, especially when I can just get a job with a good salary. This often leads to the enthusiasm fading away, and they quit." (M3). **Personal trust-based incubator relationships** enable this personal approach. As startups are operated by humans who sometimes have personal doubts and uncertainties, this approach seems crucial. These relationships are characterized by open, informal communication and the freedom to seek advice as needed. The incubator's role extends beyond formal meetings to include continuous support grounded in mutual respect and belief in the entrepreneur's vision. *"Yeah, those were just a lot of face-to-face meetings actually. We just chatted with them a lot, that's what it comes down to. And, it was very informal and unstructured." (E2). "Give trust, get responsibility. If we later find that we trust the entrepreneur in question and give them the space, it ultimately results in a responsible attitude coming back. This responsible attitude also manifests itself in the degree of effectuation, where you feel that the incubator trusts and supports you. But it also means that you can make your own choices and even fail." (M1).**

The tenant's subjective experience and evaluation of their incubation are of importance to assess the value of the role and contribution of the incubator for the entrepreneur were valuable. **Incubator evaluation** involves recurring themes about, among others, the **supportive role of incubation**. Respondents emphasized the incubator's essential supportive role in their entrepreneurial journey, mentioning the benefit of being part of a community of like-minded peers, the provision of an environment that supports business growth, and the mitigation of potential mistakes through guidance. *"But in retrospect, the incubator has proven to be valuable. You meet other entrepreneurs there who encounter similar issues, and you have access to capital, as well as the critical questions that come with it, and a bit of personal coaching." (E1). Some respondents, mostly from the UBI, indicated an **aspiration for tailored assistance**. The feedback indicated a need for more tailored support that matches their specific business requirements. They expressed a desire for more dedicated relationships with incubator staff or mentors, highlighting that the advice offered is often broad and not sufficiently specialized to meet their individual needs. *"But they're very passive in terms of the help that they give you." (E5). "That might not always be completely relevant to what you are doing. Entrepreneurship is so diverse. And people are so diverse, and teams are so diverse, and plans are so diverse. So yes, they can share quite general knowledge with you, but you have to filter for yourself." (E6). Entrepreneurs and managers from both incubators, but especially the IPI, indicated and acknowledged that the**

incubator is still developing. They described the development and challenges faced by the IPI and highlighted their initial disorganization and unstructured approach indicating that internal incubator issues can hinder its support for their tenants. Both incubators seem to aspire to continuously update and improve their offerings and programs. "Yes, that incubator was actually quite all over the place." (E2). "And so there was also a moment when the incubator, as it once was here, collapsed for the first time. Bids were made towards organizations, the startups. They all received an offer that we found to be extremely unrealistic, which we completely disagreed with. So that's how we were kicked out of the incubator from one day to the next." (E3). "I have the idea, but now, 7 years after we started, that there is now a bit more structure within Codidact. That we now have some more models and processes for new startups. But when we arrived, the whole Gasfabriek was actually still a startup. There were only 20 people on this entire site and there was nothing at all. So the Gasfabriek itself was also a Business Innovation Centre in the making, it could have also flopped." (E4).

Table 7 Data structure 5/5

<i>Ist-order codes</i>	<i>2nd-order themes</i>	<i>Aggregate dimension</i>
Access to network & expertise	Resource accessibility	Incubators' role
Access to and support with funding		
Idea generation within the incubator	Incubator program	
Learning entrepreneurial business concepts		
Opportunity assessment & business case focus		
Legal support		
Structured yet autonomous development		
Receiving actionable feedback and coaching		
Focus on serving the end user	Lean Startup based education	
Developing MVPs and staying lean		
Validation emphasis		
Business Model Canvas		
Embracing failure/contingencies & to pivot		
Incubator affirmation & reassurance	Reassurance & perspective	
Personal trust-based incubator relationships		
Supportive role of incubation	Incubator evaluation	
Aspiration for tailored assistance		
Incubator is still developing		

4.6 Visualization of the results

The matrix table below indicates the transition from effectuation to causation in the entrepreneurial journey. It presents how entrepreneurial decision-making, influenced by external and internal conditions evolves during four key developmental phases: Idea, Pre-Startup, Startup, and Post-Startup. The role of incubators in facilitating and adapting to these phases is highlighted. A notable result is the positive evaluation of the entrepreneurs and the absence of constraints. Rather than hindering, they initially enable, facilitate, and encourage entrepreneurs toward using effectuation by being flexible and adaptive, focusing on serving their potential end users, validating their propositions through MVPs, and staying lean in the process. During these earliest phases, a strong causal approach is discouraged by the incubator. As the startups move through the phases, the incubators then pivot their support towards encouraging causation. The incubators begin to emphasize setting clear objectives, engaging in planning, and preparing for expected financial returns. This shift in support aligns with the natural development of startups, from exploring opportunities with flexibility and resourcefulness to exploiting them through structured and calculated strategies. They provide adaptable support, respond to the changing needs of the entrepreneurs, offer consistent access to resources, and help the development of key entrepreneurial attitudes such as resilience and adaptability. The narrative that runs through the results is rich with insights into the entrepreneurial journey of novice entrepreneurs, complemented by the role and perspective of the incubator managers. These insights are presented in a matrix table, aimed at concisely visualizing the nuanced and complex entrepreneurial journey.

<u>Idea phase</u>		<u>Pre-startup phase</u>		<u>Startup-phase</u>		<u>Post-startup</u>		
Decision-making Logic	Predominantly effectuation		Predominantly effectuation, causation comes into play		Mix of causation and effectuation		Predominantly causation, effectuation still present	
	Effectuation	Causation	Effectuation	Causation	Effectuation	Causation	Effectuation	Causation
	Means oriented. Leveraging personal experiences and informal networks	Minimal use, with initial market awareness	Affordable loss. Partnerships. MVP development and feedback incorporation	Rough financial estimations. Initial market and competitive analysis	Leveraging contingencies. Formation of self-selected partnerships. Pivoting if needed.	Goal oriented. Resource acquisition and allocation. Goal refinement and strategic planning	Continued reliance on stakeholder relations Adapting to market changes	Expected returns. Systematic growth and data-driven decision-making. Development of business plans
External conditions	High environmental uncertainty. Unpredictable industry dynamics		High environmental uncertainty. possible regulatory landscape considerations		Emerging market feedback. Possible investor expectations		Decreased perceived environmental uncertainty	
Internal conditions	Limited financial resources, reliance on personal knowledge/experience		Limited financial resources, lack of (business) knowledge, action oriented		Increasing financial resources, resilience and adaptability		Financial stability and growth. Advanced market and operational knowledge	
Entrepreneurial behaviors	Exploration of personal interests and expertise. Ideation based on available means. Initial vision and aspiration setting		Seeking incubator support. Validation of ideas through MVPs and Lean Startup approaches. Initial non-systematic market and competitor research. Developing rough business plans and goals		Flexible adaptation to market changes and feedback. Resource-oriented actions for growth. Co-creating business with stakeholders		Detailed business planning and execution. Focus on sustainable revenue models and scaling. Professionalization of internal processes	
Incubators' role	Facilitate idea generation and provide initial feedback. Encouraging effectuation principles based on the entrepreneurs' existing knowledge and networks.		Guidance on and encouraging MVP development and validation (Lean Startup). Coaching on business models and planning, while discouraging reliance on causation		Support with legal and financial matters. Investment and funding opportunities. Access to network.		Emphasis is on strategic planning, professionalization, and expansion, with sustained mentorship for scaling and growth management.	

Table 8 Visualization of the results

5. Discussion and conclusion

5.1 Theoretical contributions through refined and new propositions

Based on qualitative semi-structured interviews with entrepreneurs and incubator managers from two different incubators, this research aimed to explore and expand our knowledge about how, when, and why incubated novice entrepreneurs use effectuation and causation in navigating their first developmental startup stages and the potential role of the incubator in supporting or hindering these decision-making processes. This study goes beyond the traditional dichotomy of causation and effectuation. Instead of treating the two logics as mutually exclusive, it explains how entrepreneurs alternate or combine both approaches in response to evolving internal and external venture conditions. Furthermore, it links the literature on both effectuation theory and business incubation. As this combination is relatively new, the explorational scope of this study allows for the findings to serve as a foundation for other scholars aspiring to bridge these two fields.

The following discussion interprets and presents the key results, leveraging existing theory and the initial propositions to actively contribute to the academic conversation about entrepreneurial decision-making within startup incubators. A reflection will be made on the initially formulated propositions from the theoretical framework presented in chapter two. The propositions will either be confirmed or refined. Also, a new set of propositions will be formulated based on the findings of this research. Additionally, this chapter presents practical insights for incubators, entrepreneurs, and policymakers, acknowledges the study's limitations, and proposes directions for future research.

Initial proposition: *The dominant decision-making logic of incubated novice entrepreneurs is causation.*

The first initial proposition suggested a dominance of causation among incubated novice entrepreneurs. However, looking at the study as a whole, there is a clear dominance of effectual action, as 243 fragments of the interviews were coded for effectuation in the first round of 1st-order coding, compared with 95 for causation. Yet throughout the early development phases, the predominance of either effectuation or causation seemed to be influenced by a dynamic blend of internal and external conditions. Consistent with the findings of Reymen et al. (2015), the conditions that influence shifts in the dominant decision-making logic include resource positions, perceived uncertainty, and stakeholder pressure. The current study confirms and builds upon theirs. It adds practical and valuable insights into how these decision-making styles play out in the context of incubation. The adopted entrepreneurial decision-making reflected a hybrid approach that uses both effectuation and causation simultaneously, with the predominant logic shifting over time. Furthermore, there was no convincing evidence found that incubators only, implicitly or explicitly, recruited entrepreneurs following a causation approach. Instead, they rather recruited entrepreneurs for their ideas, ambitions, and aspirations. This contradicts expectations derived from the study of Høvig et al., (2017) and suggests that their selection process does not determine the dominance of causation. Additionally, contrary to expectations, the methodologies and principles employed within the incubator programs enabled, facilitated, and even encouraged an effectuation-based approach in the earlier phases, while preparing and supporting the entrepreneurs for a more causation-based approach as their startups progressed.

Refined initial proposition 1: *Although used simultaneously and shifting over time from effectuation to causation, the dominant decision-making logic of incubated novice entrepreneurs is effectuation.*

The four phases of early startup development studied in this study are *(1) idea, (2) pre-startup, (3) startup, and (4) post-startup*. The results point out when, in what way, and why effectuation and/or causation decision-making styles are used throughout the phases and thus help us understand how entrepreneurs navigate from ideation to establishment and growth of their startup.

Initial proposition: *In the idea and pre-startup phases, incubated novice entrepreneurs predominantly use causation.*

Initial proposition: *As startups advance into the startup and post-startup phases, the use of causation is expected to further increase among incubated novice entrepreneurs.*

In the *idea phase*, effectuation is predominantly used with a strong emphasis on the entrepreneurs' existing knowledge, skills, and resources. Novice entrepreneurs seem to use what they know and who they know to generate business ideas, forming the starting point of their entrepreneurial journey. Entrepreneurs often rely on personal experiences, interests, or education as a source of inspiration. There's a heavy reliance on their backgrounds and spontaneous market opportunities rather than systematic market research. This finding is in line with quantitative frequency coding from the study of Reymen et al. (2015), which also showed a clear dominance of effectuation in the idea phase. In this phase, entrepreneurs don't have concrete market data or a clear understanding of potential customer needs which could explain their reliance on their existing abilities, experiences, and networks. It would also be an intuitive finding that people naturally gravitate towards an effectual approach during the idea phase, as it would be counterintuitive for people to expand on a startup idea based only on market research and in a field in which they have no personal affinity, related skills, or network.

In the *pre-startup phase*, while effectuation is predominantly used, novice entrepreneurs display a mix of effectual and causal approaches as the idea begins to take shape. As this is the phase in which they decide whether to pursue their idea, they first tend to validate their idea using a Minimum Viable Product (MVP). This Lean Startup approach is enabled, facilitated, and encouraged through the incubator program. This is in line with the findings of Ghezzi (2019), where digital startups claimed that they practiced Lean approaches when they were being incubated. This use of MVPs, like in this study, was an approach that combined their scarce resources, taking full advantage of them, into low-cost prototypes of their value propositions, testing their assumptions. Through this, they furthermore limited their risks to what they could afford to lose. Also in this phase, causation starts to come into play as entrepreneurs start to conduct some non-systematic market and competitor research. They further will define their aspirations and visions, while still avoiding detailed planning due to the perceived inherent uncertainties.

In the *startup phase*, there is a mix of causation and effectuation. While effectuation is still present, there is an increasing shift towards causation. Effectuation continues as entrepreneurs focus on flexible partnerships and stakeholder agreements through which they co-create their products while aiming to achieve product-market fit. They further adopt market feedback and leverage unexpected events. Causation becomes more pronounced and as their resource base starts to grow through investments or grants, founders begin to set clearer goals. Reymen et al. (2016) observed a similar pattern in their research on business model development. In their sample, entrepreneurs dominantly used effectual approaches to achieve a fit between their value proposition and the needs of a specific customer segment. Through these cycles of effectual interactions with stakeholders, the perceived uncertainty decreased as these interactions led to commitments from customers and partners. Then, causation logic was used to define the other parts of the business model.

The *post-startup phase* is dominantly causal with strategic planning and systematic growth efforts becoming more critical. In this phase there is a higher availability of internal data, the startup is generating revenue and there are growth signals. This further lowers the perceived environmental uncertainty and makes room for causation-based decision-making. This is further supported by a higher financial resource position, either through investments or own revenue. Founders start to professionalize their organization by defining and satisfying the needs of their startups. The team expands, and there is a focus on more sustainable revenue models and predictable income streams. Similar to the findings of Reymen (2016) and Ghezzi (2019), where entrepreneurs first used iterations, experiments, and

stakeholder interactions to create opportunities and generate data, information, and knowledge. The entrepreneurs then used this information as input for detailed business plans to acquire funding and discover scaling opportunities. Entrepreneurs are now likely to have detailed business plans and engage in strategic planning for growth and expansion. While less prominent, effectuation-based decision-making is still present in the way the founders approach their partnerships with various stakeholders, including customers, and how they leverage their flexibility, adaptability, and overall resilience in the face of contingencies.

Throughout the four phases, novice entrepreneurs seem to shift their decision-making styles and adapt based on what their internal conditions enable, and their external conditions require. The efficient and effective use of available resources seems to be balanced with goal-oriented actions to move their idea to a successful business. All identified factors, conditions, and decisions seem to be interrelated. One example is that to find ground in a new and uncertain industry filled with market and technological uncertainty founders effectually engage in building a network. Through that network, partnerships are created, and opportunities are identified and exploited. This then leads to doing business, generating revenue, and raising capital. This 'product-market fit' lowers their perceived external uncertainty and increases financial resources which enables causation-based business planning and goal setting. External and internal conditions present in each phase in this way shape entrepreneurial decisions, which in turn affect these conditions. This finding is in line with the study of Brinckmann et al. (2010) which also proposes entrepreneurial planning must be appropriate to the circumstances. The following propositions can thus be refined and confirmed and new, phase-specific propositions, can be formulated.

Refined initial proposition 2: *In the idea and pre-startup phases, incubated novice entrepreneurs predominantly use effectuation.*

Confirmed initial proposition 3: *As startups advance into the startup and post-startup phases, the use of causation is expected to further increase among incubated novice entrepreneurs.*

Proposition 4: *Entrepreneurs predominantly utilize effectuation in the idea phase, relying on existing knowledge, skills, and networks to generate business ideas.*

Proposition 5: *In the pre-startup phase, entrepreneurs employ a hybrid decision-making style, combining predominantly effectual approaches complemented by initial causal methods such as non-systematic market research and MVP validation to shape and assess the viability of their ideas.*

Proposition 6: *The decision-making style during the startup phase is characterized by a balance between effectuation and causation, with a shift towards more goal-oriented causation as entrepreneurs' resources grow and their ventures begin to scale.*

Proposition 7: *In the post-startup phase, causation becomes the dominant decision-making style as a result of reduced uncertainty and increased resources, leading to more systematic strategic planning and growth efforts.*

Initial proposition: *Even though entrepreneurs want or should display effectual action in the early phases of venture development, they are hindered by the causal influence of the incubator program.*

Initial proposition: *The Individual Private Incubators' (IPI) profit incentives may steer entrepreneurs more toward causal decision-making, in comparison to University Business Incubators (UBI).*

Contrary to the initial expectations, incubators serve not as hinderers but as enablers and facilitators in guiding entrepreneurs toward effective decision-making. The choice of decision-making logic by entrepreneurs is influenced by the characteristics of their current developmental phase, their perception

of external conditions, and the availability of internal conditions like financial resources, knowledge, and traits. The incubators seem to be aware of the needs and challenges of their incubatees. They acknowledge the external uncertainty and facilitate methods, principles, and resources to navigate this uncertainty towards new milestones. The incubator program supports its tenants in defining a future vision, a 'dot on the horizon'. They however acknowledge the unpredictability of the future and the difficulty of planning. By providing access to networks, funding, and other resources, incubators help startups overcome initial resource constraints. These provided resources are an addition to the resources available to the entrepreneur which can and are then effectually leveraged. In assessing the business opportunity, next to making scenarios for the future, incubators tend to focus on the validation of the value proposition by actively engaging (potential) customers in the process. The incubator further stimulates and encourages the startups to stay lean which enforces their focus on the affordable loss principle of effectuation while efficiently and effectively leveraging their available resources.

This study did not delve deeply into the specific distinctions between University Business Incubators (UBIs) and Independent Private Incubators (IPIs), but there were some indicators of possible differences. Respondents from the IPI indicated greater influence on decision-making by the incubator. The incubator actively defined its visions and expectations of the future and tried to align the startups with these visions. Furthermore, they mentioned that the incubator has financial incentives as they have a stake in the company. However, the IPI management emphasized their focus on enhancing future firm valuation rather than exercising direct control, while supporting various entrepreneurial approaches. Conversely, respondents from UBI observed a different scenario. They indicated that the incubator did not have certain financial incentives that steered the entrepreneurs towards a predictive and planned approach. Yet, there was a demand for more dedicated and specialized support from the UBI. This suggests a possible trade-off between the types of support and influence by UBIs and IPIs, which can be explored in future research.

Refined initial proposition 8: *Entrepreneurs want and should display effectual action in the early phases of venture development. This behavior is enabled, facilitated, and encouraged by the incubator program.*

Refined initial proposition 9: *The Individual Private Incubators' (IPI) influence on decisions may steer entrepreneurs more toward causation compared to University Business Incubators (UBI). However, its support will be more personal, committed, and specialized.*

The findings reveal that high perceived external uncertainty calls for a flexible and nonpredictive approach resembling effectuation, whereas lower perceived uncertainty facilitates causation-based decision-making. The study of Ghezzi (2019) explained this phenomenon through changing decision-making contexts, where through the results of effectuation in the early phases, the context is converted from uncertain to risky. This context then allows for decision-making based on causation. This study expands upon that insight by observing a decline in perceived external uncertainty as startups progress, alongside a growing emphasis on causation. Thus, our results suggest that effectuation can help this transition from a context of uncertainty, creating and exploring opportunities, towards risk, where these opportunities can be exploited through planning based on causation.

Contrary to initial expectations that business incubator programs might push entrepreneurs towards a causal approach, our study discovered evidence to the contrary. External pressure from stakeholders, however, can force entrepreneurs to adopt a more causation-based approach, even in the early stages when effectuation is favored by internal and external conditions and founders' preferences. For instance, investors and grant providers typically demand detailed formal business plans forecasting expected returns. A more regulatory industry like MedTech for example where there are lots of guidelines for entering the market formulated by policymakers, also forces entrepreneurs to adopt planned approaches. To get funding, the entrepreneurs prepare business plans, they however still prefer and try to act

effectually in the early phases despite these plans. This aligns with Galkina et al. (2021, p. 591), who described this phenomenon as “camouflaging the effectual behavior as causal, the entrepreneurs tried to reconcile their own actions with external demands, which served as a mechanism to decrease the tension and achieve synergy between two”

Proposition 9: *high perceived external uncertainty dictates an initial effectuation approach in decision-making, which transitions to causation as the uncertainty decreases throughout the startup phases.*

Proposition 10: *Stakeholder demands, such as those from investors, grant providers, or policymakers can impose causation-focused decision-making on entrepreneurs. Despite this, entrepreneurs show a preference for effectuation, reverting to such strategies whenever possible.*

The internal conditions of a startup further enable or hinder the adoption of effectuation or causation-based decision-making. For instance, novice entrepreneurs' recognition of their knowledge gaps drives them towards seeking guidance from incubators and collaborations with self-selected partners. In terms of a startup's financial resources, a low financial resource position drives entrepreneurs towards effectuation-based affordable loss approaches and efficiently leveraging the resources at hand. This aligns with findings from Reymen et al. (2015), which suggest that resource constraints lead entrepreneurs to expand the scope of their ventures, thereby increasing their reliance on effectual decision-making processes. A higher internal resource position and availability of internal data in the later phases will allow for more causation-based decision-making.

Another finding was the importance of personal attitudes and perspectives. Both entrepreneurs and incubator managers emphasize the value of and refer to commitment, proactiveness, shaping the future, and a focus on taking action rather than accurately predicting the future. This reflects the 'Pilot in the plane' principle of effectuation, recognized as such in this study's data structure. The presence and significance of this theme tell us something about its importance for entrepreneurship. The study of Jiang and RÜling (2017) for example found that although founding teams acknowledge external uncertainty, they have a high level of confidence about their ability to respond to the market (response uncertainty). This feeling of confidence and control in turn led them towards the use of effectuation. Similarly, other research found that Entrepreneurial Self Efficacy, a confidence of one's entrepreneurial ability, positively increased the use of effectuation (Engel et al., 2014). This was a notable finding since they also focused specifically on novice entrepreneurs, with effectuation being proposed as expert decision-making logic (Sarasvathy, 2008).

An ambition for speed and momentum and having entrepreneurial confidence while being action-oriented may lead to a preference for effectuation over causation, even when more resources are available. This is consistent with recent literature showing that decision-making styles can affect gestation speed, which refers to the time it takes to turn an idea into a business. Mauer et al. (2021), in their study with the subtitle 'Causal brakes and effectual pedals', indicate that entrepreneurs leaning towards effectuation in early startup phases achieve faster gestation than those adopting a causal approach. However, they identified one 'causal pedal', the pursuit of early investments. Their findings suggest that founders of the fastest startups primarily developed a business plan to align with investor requirements, unlike the slowest startups, which used plans for actual strategic planning. This observation is consistent with the behavior of entrepreneurs in the current study and that highlighted by Galkina et al. (2021). Furthermore, the incubated novice entrepreneurs seem to embrace uncertainty, actively seek out and incorporate diverse perspectives, and remain flexible enough to pivot based on new information. Such attitudes enable them to exploit the full benefits of incubation programs, including mentorship, networking, and resource allocation, which can be crucial in navigating the early and often challenging phases of startup development. A personal inclination to avoid engagement with external stakeholders can act as a significant barrier, making all subsequent steps more challenging. The results suggest that having this 'pilot in the plane' attitude is crucial for using effectual decision-making.

Present in all incubated entrepreneurs, it could also be hypothesized that the incubator shaped or fostered these attitudes and perspectives. These attitudes have the potential to shift novices from their default response to uncertainty toward adopting the expert decision-making process of effectuation.

Proposition 11: *A low financial resource position leads entrepreneurs to adopt effectuation-based approaches, focusing on minimizing losses and maximizing the use of current resources. As financial resources and internal data availability increase, entrepreneurs are more likely to engage in causation-based decision-making, planning strategically based on this new information.*

Proposition 12: *Personal attitudes and perspectives such as commitment, proactiveness, and a 'Pilot in the plane' mindset, which emphasizes shaping the future through present actions, are strongly associated with effectuation principles and are influential in the decision-making of novice entrepreneurs.*

This is further validated by the fact that among the four dimensions of effectuation and causation, each having both an effectual and causal version, only seven of eight were found in the data; four for effectuation but only three for causation. The one missing was: Causation/attitude toward unexpected events: avoid. This could indicate that this behavior is not part of entrepreneurial decision-making in incubators. This makes sense as in environments where change is the only constant, the ability to adapt quickly to unforeseen events can be more valuable than trying to avoid them. Furthermore, preparing and avoiding contingencies typically requires allocating resources toward risk mitigation. In new and uncertain markets, entrepreneurs might prefer to allocate these resources toward market exploration, experimentation, validation, or other areas that directly contribute to discovering and capitalizing on emerging opportunities.

The educational background of novice entrepreneurs could also be a contributor to making more causation-based decisions. Entrepreneurs educated in engineering and technology fields tend to be conservative and committed to perfecting their products and as a result, avoid or delay interaction with the market (Whittaker, 2001). Business administration-educated entrepreneurs tend to stay in theory and as a result, also avoid or delay market interaction (Dew et al., 2009). The fact that this behavior is not present in the data of this study could point to the incubator stimulating a market-oriented approach, combating novice entrepreneurs' tendency to avoid market interaction. A likely explanation for this could be the focus on Lean Startup methods and principles in the incubator programs and teachings. These methods lead entrepreneurs to focus on co-creating, experimenting, and validation in the market. Furthermore, it emphasizes a flexible and adaptable attitude towards unexpected feedback through pivoting. Managers of the incubator expressed their commitment to keeping up with the latest trends and 'best practices' within the worldwide startup landscape. This trend aligns with findings from Ghezzi's (2019) study, which revealed that founders were turning to Lean Startup Approaches as alternatives to conventional business planning methods. His study further explains the connection between effectuation logic and LSAs elements. LSAs prioritize collaboration and openness over controlling, concealing, and defending business ideas. In this approach, the main competitive edge lies in the startup's ability to learn quickly, rather than in its initial know-how. This perspective connects to the principles of effectual logic, which emphasizes partnerships and cooperation over competition (Sarasvathy, 2001; Yang et al., 2018). A novice's educational & entrepreneurial background starts as their strength but becomes their weakness, which the incubator then potentially mitigates. In the earliest stages, novice entrepreneurs leverage their knowledge and experience to identify opportunities and generate ideas. However, their education could then lead them to avoid interaction with the market. Based on the results of this study, novice entrepreneurs could potentially mitigate their experience deficit by joining an incubator.

Proposition 13: *Incubator programs, by emphasizing Lean Startup methodologies, encourage effectuation and help novice entrepreneurs overcome their educational predispositions towards market avoidance through perfectionism and theory.*

5.2 Practical implications

The findings of this study offer valuable actionable insights for stakeholders in the startup ecosystem. They align with, reinforce, and extend the existing research body of research on effectuation theory, confirming its relevance in the context of incubators. The alignment of this study with previous analyses (Grégoire and Cherchem, 2020), suggests the potential effectiveness of incubators for novice entrepreneurs, as effectuation is regarded as an expert logic. While the findings emphasize the value of effectuation in terms of speed, adaptability, and network building, they also acknowledge the continued importance of causation when dealing with external stakeholders. For example, raising capital from investors and planning for growth require causation-based analyses. Recognizing the importance of entrepreneurial decision-making styles and their influence from the early stages of a startup's life is crucial for business incubators, entrepreneurs, investors, and policymakers. The findings also indicate the importance of assessing the role of internal and external conditions, as well as the developmental stage of a startup in influencing decision-making.

Business incubators play an important role in supporting novice entrepreneurs, who often face both resource constraints and uncertain market conditions. They should customize their support and programs to align with the specific development phase of a startup. Recognizing the shift from effectuation to causation in entrepreneurial decision-making styles, incubators can offer phase-appropriate resources, mentorship, and training. Incubators and other entrepreneurship educators should promote a balanced approach to decision-making, highlighting the strengths of both effectuation and causation. The incubators in this study already unconsciously promoted effectuation by, for example, adopting Lean Startup methodologies. The use of these Lean Startup methodologies and principles within incubator programs is recommended, particularly in the early stages, to facilitate rapid testing of ideas, market feedback adaptation, and necessary pivoting, all of which are in line with the effectuation process. Shifting from this unconscious adoption to a conscious use of both effectuation and causation through their support requires a deeper awareness and understanding of these concepts among incubator staff. Furthermore, personal traits such as proactiveness, resilience, and adaptiveness seemed to be crucial in the process and incubators should include personal development and mentoring to cultivate these traits, enabling entrepreneurs to navigate the uncertainties and challenges of the startup journey effectively.

Entrepreneurs must be able to understand and apply the appropriate mix of decision-making styles, throughout their entrepreneurial journey, taking into account the interplay between these styles and the growth phases of their startups. Throughout the various phases of startup growth, their decisions are continually influenced by changing internal and external conditions. These decisions, in turn, shape the startup, creating a dynamic feedback loop where the evolving conditions influence future decision-making. Entrepreneurs must recognize that they are at the core of this process. Understanding when each approach is more beneficial and being able to shift between and combine the most effective parts of both flexible and planned decision-making styles as conditions evolve can serve as key entrepreneurial skills. Novice entrepreneurs are encouraged to embrace business incubators, especially when navigating uncertain markets. Incubators can offer invaluable resources, actionable feedback, coaching, and decision-making support. Additionally, networking within the incubator, leveraging its resources, and early customer interaction to validate and refine value propositions are highly recommended actions. Entrepreneurs should also note that external investors and regulated industries often require and value causal business plans and forecasts as part of their evaluation process. When considering joining an incubator, it's important for entrepreneurs to assess the incubator's demands regarding these plans and the level of freedom and autonomy they allow in decision-making. As entrepreneurs go on their journey, the concept of the "planning effectuator" becomes relevant. This term, introduced by Smolka et al. (2018), describes the balance between experimentation in the early stages and a gradual shift to more structured planning as the venture progresses.

Investors should be aware of their influence on entrepreneurial decision-making styles and the potential

drawbacks of pushing for a causal approach too early. They need to consider the complete entrepreneurial picture, including the conditions at play and the progression of the startup. Business incubators must protect entrepreneurial ventures from investor pressure that may prematurely force a shift to a more causal decision-making approach, potentially hindering the necessary flexibility and adaptability at early stages. Finally, **policymakers** are responsible for creating a favorable environment for startups to thrive. This involves first understanding the specific needs of incubated startups and the value that incubators provide, and then developing policies and funding schemes to meet those needs. By doing so, policymakers can create a more favorable startup ecosystem that promotes growth and innovation.

5.3 Limitations and promising future research avenues

This study has several limitations that future research could address. Firstly, retrospective bias may have affected the accuracy and completeness of data, especially the earlier moments in history. Also, some entrepreneurs currently have been in business for about 8 years, and while they were novice entrepreneurs when starting their venture, their current knowledge could potentially affect their retrospective answers. Integrating and adding the answers of the managers served as a measure against this bias as it provided an extra top-down dimension to the data. Nevertheless, future research could benefit from documenting the dynamics in real time, and using additional data collection methods like surveys or observational data, to see if the findings of this research still hold. Additionally, the study's qualitative approach means the findings are based on subjective interpretations from entrepreneurs and incubator managers. This subjectivity, though insightful, might lead to biases or an overemphasis on specific themes, potentially neglecting others. Observer bias could also have influenced how interviewees perceived the questions or how the interviewer interpreted the responses (Yin, 1984). While the aim of this study was not generalizability, the focus on two types of incubators - University Business Incubators (UBIs) and Individual Private Incubators (IPIs) does not include the entire spectrum of business incubators (Grimaldi and Grandi, 2005). While comprehensive and aligned with prior research, the study is limited by its focus on only two types of incubators and its relatively small sample size. Further research could benefit from including a focus on Business Innovation Centres and Corporate Private Incubators. Lastly, the incubators and entrepreneurs studied are located within specific geographic and cultural contexts. The decision-making styles and incubators' tendencies toward effectuation and causation may be closely tied to these contexts, which might limit the application of findings to other regions or cultural settings. Therefore, further research on other ecosystems in different regions and different countries is necessary.

This study lays a foundation for future research that aims to bridge entrepreneurial decision-making and business incubation. Firstly, longitudinal studies are a promising next step. These studies could monitor the progression of decision-making styles of entrepreneurs who were previously incubated over time. Revisiting the current study's participants in the following years would offer additional insights into their development. Including entrepreneurs from failed startups or those completely dissatisfied with their incubation experience could offer a valuable contrast to this study's findings and provide a more complete understanding of less successful incubators. Also, the question of how decision-making styles from incubated novice entrepreneurs influence startup success or failure remains open. Also, large quantitative studies could also compare decision-making in and out of incubation environments. A comparative analysis, focusing on novice entrepreneurs' attitudes to unforeseen events and their speed in achieving product-market fit, would be interesting. This approach could highlight the unique impacts of incubators on entrepreneurial decision-making. Moreover, despite the passive promotion of effectuation theory by incubator managers through Lean Startup Methodologies, there is a gap in understanding and consciously applying effectuation theory within incubator programs. Addressing this gap requires a new approach to education and program design, ensuring that incubator managers not only understand but can also actively apply the principles of effectuation. Lastly, this study pointed out numerous internal and external conditions and characteristics that seem influential within business

incubation. However, further research is required to determine the significance of these conditions in shifting decision-making styles. Future variance studies could explore whether specific internal and external conditions, along with certain incubator characteristics, have a causal influence on the tendencies for either effectuation or causation in entrepreneurial decision-making.

5.4 Conclusion

This study went on an exploratory journey to understand the dynamics of entrepreneurial decision-making of novices in startup incubation, focusing on the interplay between effectuation and causation. Using a qualitative research design, the study engaged with entrepreneurs and incubator managers through semi-structured interviews. The data analysis process followed the Gioia methodology, ensuring a rigorous approach. The findings contribute significantly to entrepreneurial theory and practice. They reveal that and how, incubated novice entrepreneurs navigate early development by blending effectuation and causation, shifting their strategies to match the evolving internal and external conditions of their startups. Contrary to prior assumptions, incubators do not hinder their tenants with a causal bias. Instead, they dynamically support entrepreneurs' decision-making that aligns with each startup's developmental stage. Incubators, by using methodologies like Lean Startup in their programs, unconsciously promote effectuation in the early stages. They guide entrepreneurs towards causation as their ventures mature. The findings indicate the importance of tailored support, emphasizing the need for incubators to align their resources and training with the specific development phase of a startup. Entrepreneurs benefit from recognizing the value of balancing effectuation and causation in their decision-making processes. This study extends the existing literature by explaining how effectuation and causation are not mutually exclusive, but part of dynamic decision-making. If entrepreneurship research shows that expert entrepreneurs apply effectuation, it follows that such logic should be a priority in business incubation. The incubator managers in the studied incubators appeared to unconsciously promote effectuation through Lean Startup Methodologies, yet without an awareness of effectuation and causation theories. This finding demands further research to determine whether these incubators are outliers or if they indicate a broader trend in business incubation. The study bridges the gap between entrepreneurship theory and the practical field of business incubation. While providing valuable insights, the study acknowledges its limitations, including potential retrospective bias and its focus on only two types of incubators. Promising avenues for further research include longitudinal studies, comparative quantitative analyses, and exploration of incubators in different cultural and geographic contexts. In sum, this study emphasizes the nuanced and evolving nature of entrepreneurial decision-making within incubation environments. It highlights the role incubators play in shaping these processes and offers a new perspective on the entrepreneurial journey, one that is not linear but adaptive and responsive to changing circumstances. These findings aim to inspire further academic exploration and inform strategies that support novice entrepreneurs in our Volatile, Uncertain, Complex, and Ambiguous world.

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Appendices

Appendix A: Interview Guides

English Interview Guide for the entrepreneurs

Part 1. Introduction

I am a student in the master's program in Business Administration at the University of Twente. For the completion of my master's degree, I am conducting research on the decision-making practices of entrepreneurs within a business incubator and the influence of the incubator program on this process. My research question is as follows:

“How do incubated novice entrepreneurs utilize and navigate different decision-making styles (effectuation and causation) throughout the first stages of the entrepreneurial process and how does the incubators' influence support and/or hinder this process?”

In this interview, I'm excited to learn about the evolution of the first ideas, the journey from ideation to the establishment of your startup, and the important decisions you and your team made throughout this transformative process. The interview consists of a number of open questions and will take about 45 minutes. There are no wrong answers, and you are welcome to take some time to reflect if you feel you need to. You can also ask for clarification if something is not clear/something does not feel comfortable. With your permission, I will make an audio recording of the interview so that I can transcribe it later. To ensure anonymity, names that may be mentioned will be removed from the research report and the transcript of the interview. Do you have any questions before I begin the interview?

Introduction of the entrepreneur and company

- Can you briefly describe your entrepreneurial background and the venture you are currently working on within the incubator? (Age, education, work experience, industry/core business, founding year, current entrepreneurial phase, etc.)
- When did you first come in contact with the incubator (Codidact / NovelIT)?

Part 2. Idea & Pre-startup phases- Let's start by discussing the idea and pre-startup phases.

- How did you come up with the initial business idea?
- What made you decide to pursue the opportunity and actually start the company?
 - Was the initial goal clear from the start, or was it more like "see where this is going to end"?
 - What role did the incubator play in the assessment of the opportunity?

Part 3. Startup-phase & Post-startup phases - Now, let's discuss the startup phase and your decision-making.

- What did the process of starting the company look like?
- What are you considering when you make business decisions?
- How do you make decisions when it comes to potential risks and returns?
- How much reliance did you place on predictive models (for example, market analysis, competitive analysis, and customer analysis)?
- How did partnerships influence your business or decision-making? For what purposes are they used? Do you have any specific examples?
- How did you deal with unexpected problems or events? Can you think of any examples?
- To what extent did you have a clear goal for the future? What did this look like?

Part 4. Influence of the incubator (program)

- To what extent did you use a planning process (business plan/model) throughout the development of the startup? Can you explain to me to what extent the incubator program imposed that on you?
- How do you evaluate the role of the incubator during the startup process?
- Can you cite specific instances where the incubator's guidance, resources, or mentorship influenced your decision-making?
 - What was the most pivotal moment of influence by the incubator in your view?
- Can you reflect on how satisfied you are overall with your experience with the incubator?
 - Was it supportive, or neutral or did you feel hindered in certain instances?
 - Can you illustrate this with examples?

Part 5. Finalization

- Thank the entrepreneur for cooperating.
- Tell him/her he will receive the transcript in a few days.
- Ask if the entrepreneur is interested in receiving a (digital) copy of the thesis once finished.

Dutch Interview Guide for the entrepreneurs

Deel 1. Inleiding

Ik ben een student aan de masteropleiding business administration aan de Universiteit Twente. Voor de afronding van mijn master doe ik onderzoek naar het besluitvormingsgedrag van ondernemers binnen een business incubator en de mogelijke invloed daarbij van de incubator. Mijn onderzoeksvraag is:

"Hoe gebruiken beginnende ondernemers in een incubator verschillende besluitvormingsstijlen (effectuation en causation) gedurende de eerste fasen van het ondernemersproces en hoe ondersteunt en/of belemmert de invloed van de incubator dit proces?".

In dit interview ben ik benieuwd naar het ontstaan van de eerste ideeën, de reis van ideevorming tot de oprichting van de startup en de belangrijke beslissingen die jij en je team hebben genomen tijdens dit proces. Het interview bestaat uit een aantal open vragen en duurt ongeveer 45 minuten. Er zijn geen foute antwoorden en je mag gerust even de tijd nemen om na te denken als dat nodig is. Je kunt ook om opheldering vragen als iets niet duidelijk is of als je je ergens niet prettig bij voelt. Met jouw toestemming maak ik een audio-opname van het interview zodat ik het later kan transcriberen. Om de anonimiteit te waarborgen, worden namen die eventueel genoemd worden verwijderd uit het onderzoeksrapport en het transcript van het interview. Heb je nog vragen voordat ik met het interview begin?

Introductie van de ondernemer en het bedrijf

- Kunt u in het kort uw achtergrond als ondernemer beschrijven en de onderneming waar u momenteel aan werkt? (Leeftijd, opleiding, werkervaring, sector/kernactiviteit, oprichtingsjaar, huidige ondernemersfase, etc.)
- Wanneer kwam u voor het eerst in contact met de incubator (Codidact / NovelT)?

Deel 2. Idee- & pre-startup fasen - Laten we beginnen met het bespreken van de idee- en pre-startup fasen.

- Hoe is het eerste businessidee ontstaan?

- Wat deed je besluiten om de kans na te jagen en het bedrijf daadwerkelijk te starten?
 - Was het oorspronkelijke doel vanaf het begin duidelijk, of was het meer van "kijken waar dit gaat eindigen"?
- Welke rol speelde de incubator bij de beoordeling/ inschatting van de kans?

Deel 3. Startup & Post-startup fase - Laten we nu de opstartfase en besluitvormingen bespreken.

- Hoe zag het proces van het opstarten van het bedrijf eruit?
- Waar houd je rekening mee bij het nemen van zakelijke beslissingen?
- Hoe neem je beslissingen als het gaat om potentiële risico's en opbrengsten?
- In hoeverre heb je vertrouwd op voorspellende modellen (bijvoorbeeld marktanalyse, concurrentieanalyse en klantanalyse)?
- Hoe hebben samenwerkingen uw bedrijf of besluitvorming beïnvloed? Voor welke doeleinden worden ze gebruikt? Heb je specifieke voorbeelden?
- Hoe ben je omgegaan met onverwachte problemen of gebeurtenissen? Kun je voorbeelden bedenken?
- In hoeverre had je een duidelijk doel voor de toekomst? Hoe zag dit eruit?

Deel 4. Invloed van de incubator/ het incubatorprogramma

- In welke mate heb je een planningsproces (bedrijfsplan/model) gebruikt tijdens de ontwikkeling van de startup? Kun je mij uitleggen in hoeverre het incubatorprogramma u dat heeft opgelegd?
- Hoe kijk je terug op de rol van de incubator tijdens het opstartproces?
- Kun je specifieke gevallen noemen waarin de begeleiding, de middelen of het mentorschap van de incubator uw besluitvorming hebben beïnvloed?
 - Wat was volgens jou het daarbij belangrijkste moment?
- Kun je aangeven hoe tevreden je bent over uw ervaring met de incubator?
 - Was het ondersteunend, of neutraal of voelde je je in bepaalde gevallen belemmerd?
 - Kun je dit toelichten met voorbeelden?

Deel 5. Afronding

- Bedank de ondernemer voor zijn medewerking.
- Vertel hem/haar dat hij/zij het transcript binnen een paar dagen zal ontvangen.
- Vraag of de ondernemer geïnteresseerd is in het ontvangen van een (digitale) kopie van de scriptie zodra deze klaar is.

Interview guide for the incubator managers

Part 1. Introduction

First of all, thank you for taking the time for this interview. As you know, I am conducting research on the role of business incubation in shaping the decision-making styles of early-stage entrepreneurs. The purpose of this interview is to gain insight into the incubator's perspective. The interview consists of a number of open-ended questions and is estimated to take around 45 minutes. Take all the time you need to answer and feel free to ask for clarification if something is unclear or if you feel uncomfortable about something. I want to stress that of course there are no wrong answers. I am looking for your personal experiences and insights. With your approval, I will make an audio recording of our conversation. This recording will be used strictly for this study and will be deleted after completion. To ensure your privacy, any names mentioned or sensitive information will be omitted from the survey.

Do you have any questions or comments before we start?

General Questions:

- Could you briefly talk about your role within the incubator and your experience working with startups?
- In your words, how would you describe the mission and vision of Novel T/Codidact?

Part 2. Supporting entrepreneurs:

Explain the four phases: - idea – pre startup – startup – poststartup

- In your view, what do entrepreneurs need at the different stages of their startup's development?
- In terms the timing of initial contact between the incubator and entrepreneur. What happens in practice and what would be most optimal?

Part 3. Decision-making styles + explanation of effectuation and causation

Effectuation and causation are two different approaches to entrepreneurship and decision-making.

- Causation is the traditional, plan-based approach to entrepreneurship. It assumes a clearly defined goal and a predetermined plan to achieve that goal. Entrepreneurs following this approach often base their decisions on market research, competitive analysis and predicted returns. They try to control the future by predicting it.
- Effectuation, on the other hand, is a more flexible and adaptive approach. Instead of starting with a specific goal, effectuation entrepreneurs start with the resources at their disposal and look for opportunities to use these resources. They are willing to adjust their goals based on the feedback and opportunities they encounter along the way. Effectuation is about collaboration, taking calculated risks and exploiting uncertainties.

In essence, causation is about 'choosing a goal and figuring out how to get there', while effectuation is about 'starting with what you have and figuring out where to go'.

- How would you describe the decision-making styles of the entrepreneurs within your incubator?
 - What is the dominant approach?
 - Are there differences in the stages of startup development?
- How do you see the influence of effectuation and causation on the overall success and growth of ventures within your incubator?
- Some entrepreneurs consider a business plan a crucial document for their business, while others may not place as much emphasis on it. What is your view on the importance of a business plan for startups within your incubator?
- What measures do you take to facilitate and encourage effective decision-making among entrepreneurs who naturally adopt this style?

Part 4. Selection process:

- What criteria does the incubator apply when selecting startups or entrepreneurs?

Part 5. Differences incubators:

- How do your incentives and participations influence the way the incubator works with entrepreneurs?
- Are there other factors or considerations you think influence the decision-making styles of entrepreneurs within the incubator?
- Where does this style come from?
- Do you see any development or change in Novel T/Codidact's approach in recent years?

Part 6. Closing:

- As an incubator manager, what challenges do you face in supporting entrepreneurs, regarding their decision-making?
- How do you plan to address these challenges and improve your support for entrepreneurs in the future?

These were all the questions I had for you. I'm convinced that your input will be invaluable for my thesis.

- Thank you again for being open to this interview.
- Ask if the manager is interested in receiving a (digital) copy of the thesis as soon as it is ready.

Dutch Interview guide for the incubator managers**Deel 1. Introductie**

Allereerst bedankt dat je de tijd hebt genomen voor dit interview. Zoals je weet doe ik onderzoek naar de rol van business incubation bij het vormgeven van besluitvormingsstijlen van beginnende ondernemers. Het doel van dit interview is om inzicht te krijgen in het perspectief van de incubator. Het interview bestaat uit een aantal open vragen en duurt naar schatting zo'n 45 minuten. Neem alle tijd die je nodig hebt om te antwoorden en vraag gerust om verduidelijking als iets onduidelijk is of als je je ergens oncomfortabel bij voelt. Ik wil benadrukken dat er natuurlijk geen foute antwoorden zijn. Ik ben op zoek naar jouw persoonlijke ervaringen en inzichten. Met jouw goedkeuring maak ik een audio-opname van ons gesprek. Deze opname wordt strikt voor dit onderzoek gebruikt en zal na afronding worden verwijderd. Om jouw privacy te garanderen, zullen eventueel genoemde namen of gevoelige informatie uit het onderzoek worden weggelaten.

Heb je nog vragen of opmerkingen voordat we van start gaan?

Algemene vragen:

1. Zou je kort iets kunnen vertellen over je rol binnen de incubator en je ervaring met het werken met startende ondernemers?
2. Hoe zou je de missie en visie van Novel T/Codidact in jouw woorden omschrijven?

Deel 2. Ondersteunen van ondernemers:

Uitleg van de vier fasen - idea – pre startup – startup – poststartup

1. Wat hebben ondernemers in jouw opzicht nodig in de verschillende fasen van de ontwikkeling van hun startup?
2. In termen de timing van eerste contact tussen incubator en ondernemer. Wat is de praktijk en wat zou het meest optimaal zijn.

Deel 3. Besluitvormingsstijlen + uitleg van effectuation en causation

Effectuation en causation zijn twee verschillende benaderingen van ondernemerschap en besluitvorming.

- Causation is de traditionele, planmatige benadering van ondernemerschap. Het gaat uit van een duidelijk gedefinieerd doel en een vooraf vastgesteld plan om dat doel te bereiken. Ondernemers die deze benadering volgen, baseren hun beslissingen vaak op marktonderzoek,

concurrentieanalyse en voorspelde rendementen. Ze proberen de toekomst te beheersen door deze te voorspellen.

- Effectuation, aan de andere kant, is een meer flexibele en adaptieve benadering. In plaats van te beginnen met een specifiek doel, beginnen effectuation-ondernemers met de middelen die ze tot hun beschikking hebben en zoeken ze naar mogelijkheden om deze middelen te gebruiken. Ze zijn bereid hun doelen aan te passen op basis van de feedback en kansen die ze onderweg tegenkomen. Effectuation gaat uit van samenwerking, het nemen van gecalculerde risico's en het benutten van onzekerheden.

In essentie gaat causation over 'het kiezen van een doel en uitzoeken hoe je daar komt', terwijl effectuation gaat over 'beginnen met wat je hebt en uitzoeken waar je naartoe kunt gaan'.

3. Hoe zou je de besluitvormingsstijlen van de ondernemers binnen jullie incubator omschrijven?
 - Wat is de dominante benadering?
 - Zijn er verschillen in ontwikkelingsfasen van ondernemingen?
4. Hoe ziet u de invloed van effectuation en causation op het algehele succes en de groei van de ondernemingen binnen uw incubator?
5. Sommige ondernemers beschouwen een ondernemingsplan als een cruciaal document voor hun bedrijf, terwijl anderen er misschien niet zoveel nadruk op leggen. Wat is uw standpunt over het belang van een ondernemingsplan voor startups binnen uw incubator?
6. Welke maatregelen neemt u om effectuele besluitvorming te faciliteren en aan te moedigen bij ondernemers die van nature deze stijl aannemen?

Deel 4. Selectieproces:

7. Welke criteria gebruikt de incubator bij het selecteren van startups of ondernemers?

Deel 5. Verschillen incubators:

8. Hoe beïnvloedt jullie wintoogetmerk en participaties de manier waarop de incubator met ondernemers werkt?
9. Zijn er andere factoren of overwegingen die je denkt dat van invloed zijn op de besluitvormingsstijlen van ondernemers binnen de incubator?
10. Waar komt deze stijl vandaan?
11. Ziet u een ontwikkeling of verandering in de aanpak van Novel T/Codidact in de afgelopen jaren?

Deel 6. Afsluiting:

12. Met welke uitdagingen word je als incubatormanager geconfronteerd bij het ondersteunen van ondernemers, met betrekking tot hun besluitvorming?
 - Hoe plant u deze uitdagingen aan te pakken en uw ondersteuning voor ondernemers in de toekomst te verbeteren?
- Dit zijn alle vragen die ik voor je had. Ik weet zeker dat je antwoorden heel waardevol zullen zijn voor mijn onderzoek.
- Nogmaals hartelijk dank dat je openstond voor dit interview.
- Vraag of de manager geïnteresseerd is in het ontvangen van een (digitale) kopie van de scriptie zodra deze klaar is.

Appendix B: Full data structure

Table 9 Full data structure

<i>Ist-order codes</i>	<i>2nd-order themes</i>	<i>Aggregate dimensions</i>
Spotting an opportunity based on their own existing knowledge and experience	Means driven action	Effectual decision-making
Using their knowledge base to make decisions		
Leveraging existing skills and resources at hand		
Defining only rough visions while leaving the details open		
Leveraging existing networks for opportunity creation & identification		
Following personal principles and preferences		
Being willing to make affordable personal sacrifices	Affordable loss	
Deferred financial expectations		
Investing limited, small amounts of money, time, and effort		
Finding unused resources in the local environment		
Limiting stakeholders' commitments to levels that are uncritical to them	Leveraging contingencies	
Strategic flexibility in response to market uncertainty		
Accepting/gathering & incorporating unforeseen customer feedback		
Adapting plans to accommodate unforeseen events		
Actively exposing the company to outside influences		
Embracing unforeseen developments and opportunities		
Seeking guidance from an incubator	Commitments and self-selected partnerships	
Engaging with potential clients to identify opportunities		
Exposing MVP to potential clients early on		
Co-creating business with customers		

Engaging with stakeholders to create and pursue opportunities together			
Co-creating business with stakeholders			
Trust-based flexible stakeholder agreements and commitments			
Defining a clear direction and emphasizing its need	Goal driven action	Causal decision-making	
Basing actions upon expectations and predictions			
Defining and pursuing specific project goals, product, customer needs, or market goals			
Searching and selecting partners based on predefined plans			
Defining and satisfying organizational needs			
Developing an extensive business plan			
Carrying out non-systematic competitor and competitive positioning analysis			Market research and competitive analysis
Carrying out market research			
Acquiring resources through market contract-based agreements			
Analyzing financial viability	Expected returns		
Searching for stakeholders to commit the amounts necessary for the execution of the plan			
Calculating expected financial outcomes/returns			
The unpredictability of the future and the difficulty of planning	High perceived environmental uncertainty	External conditions	
Unforeseen challenges and surprises			
Validation/traction from customers	Lower perceived environmental uncertainty		
Growth signals & generating revenue			
Investors and grant providers demanding business plans	Stakeholder pressure		
Influence of policymakers			
Influence on decisions by the incubator			
Low financial resource position	Financial resource position	Internal conditions	
High financial resource position			

Educational & entrepreneurial background	Knowledge assets	
Lack of (business) knowledge		
External knowledge acquisition		
Availability of internal data & knowledge		
Aspirations of their entrepreneurial future & impact	Pilot in the plane	
Proactive commitment & ownership		
Ambition for speed and momentum		
Learning by doing		
Curiosity-driven	Personal attitudes and perspectives	
Action-oriented		
Entrepreneurial confidence & optimism		
Resilience and adaptability		
Personal doubt & uncertainty		
Access to network & expertise	Resource accessibility	Incubators' role
Access to and support with funding		
Idea generation within the incubator	Incubator program	
Learning entrepreneurial business concepts		
Opportunity assessment & business case focus		
Legal support		
Structured yet autonomous development		
Receiving actionable feedback and coaching		
Focus on serving the end user	Lean Startup based education	
Developing MVPs and staying lean		
Validation emphasis		
Business Model Canvas		
Embracing failure/contingencies & to pivot		
Incubator affirmation & reassurance	Reassurance & perspective	

Personal trust-based incubator relationships	Incubator evaluation	
Supportive role of incubation		
Aspiration for tailored assistance		
Incubator is still developing		

