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From tensions to synergy: Causation and effectuation in the process of venture creation

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Abstract

Research Summary: This article examines previously neglected tensions between causation and effectuation in the process of new venture creation. We studied 41 episodes of new venture creation by entrepreneurs in Finland and Denmark, who we followed applying the diary method. We reveal tense relations between the respective causation and effectuation principles at multiple levels, and identify the corresponding mechanisms for their resolution, which, in turn, lead to the synergy. This study enriches the effectuation research by offering a dynamic perspective on causation-effectuation interplay and categorizing three modes of their interaction, that is, separation, hybrid synergy, and tensions.

Managerial Summary: Venture creation is a complex process that involves different decision-making logics. While combining the goal-driven logic of causation and non-goal driven logic of effectuation is essential for the success of a start-up, the road to their synergy can be paved with different tensions. Our study of 41 episodes of new venture creation by entrepreneurs in Finland and Denmark shows that these tensions can occur at the individual, organizational and inter-organizational levels. We also show four different mechanisms of how entrepreneurs can overcome these tensions within their ventures and in relations with other stakeholders.

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KEYWORDS

causation, effectuation, synergy, tensions, venture creation

“From the point of view of pure logic or philosophy, there will often be a dialectical tension between two concepts.”

“For example?”

“If I reflect on the concept of ‘being,’ I will be obliged to introduce the opposite concept, that of ‘nothing.’ You can’t reflect on your existence without immediately realizing that you won’t always exist. The tension between ‘being’ and ‘nothing’ becomes resolved in the concept of ‘becoming.’ Because if something is in the process of becoming, it both is and is not.”

Jostein Gaarder, 1991. *Sophie's World: A Novel About the History of Philosophy*.

1 | INTRODUCTION

In her seminal article, Sarasvathy (2001) expressed a fundamental idea about the relationship between causation and effectuation. She emphasized that the two logics “can occur simultaneously, overlapping and intertwining over different contexts of decisions and actions” (p. 245). Further studies have also acknowledged that causation and effectuation are not mutually exclusive alternatives (Chandler, DeTienne, McKelvie, & Mumford, 2011; Kerr & Coviello, 2020; Perry, Chandler, & Markova, 2012), and the application of both leads to the better performance of entrepreneurial ventures (Broun & Sieger, 2020; Smolka, Verheul, Burmeister-Lamp, & Heygens, 2018). Studies looking at this interplay and aiming to grasp the synergistic coexistence of two logics in different contexts have been numerous and even constitute a separate stream in the effectuation research (Matalamäki, 2017). While the essence of synergy is interaction,¹ they have predominantly viewed causation-effectuation interplay either as iterative shifts from one logic to another (Nummela, Saarenketo, Jokela, & Loane, 2014; Reymen et al., 2015; Sitoh, Pan, & Yu, 2014) or as their application to different tasks within bigger assignments (Futterer, Schmidt, & Heidenreich, 2017; Reymen, Berends, Oudehand, & Stultiens, 2016). Hence, with the aim to depict the connection between causation and effectuation, scholars practically show their separation in time and/or in relation to different tasks. In addition, received studies on the combined use of causation and effectuation predominantly concentrate on a single level of analysis such as individual (Alsos & Clausen, 2014) and firm levels (Smolka et al., 2018). While it has been acknowledged that causation-effectuation relations are interwoven in a more complex way (Alsos, Clausen, Mauer, Read, & Sarasvathy, 2019), our knowledge about how these logics are manifested across different levels remains incomplete. Overall, we still know little about the actual interactivity and the synergy between two logics.

Furthermore, the causation and effectuation follow essentially different principles and suppose fundamentally different behaviors (Sarasvathy, 2001). In this regard, we see some signals in the literature that their combination can cause tensions.² For example, Kitching and Rouse (2020) argue that their simultaneity would suppose that decision-making outcomes are both predictable and unpredictable, which would lead to contradictions. Other studies show these tensions can occur when some stakeholders (such as start-up incubators and venture funds) demand more causal, predictive strategies from otherwise effectual entrepreneurs (Appelhoff, Mauer, Collewaert, & Brettel, 2016; Frese, Geiger, & Dost, 2019; Wiltbank, Read, Dew, & Sarasvathy, 2009). Also, Alsos, Clausen, Hytti, and Solvoll (2016) indicate that causal or effectual reasoning is subject to entrepreneurial identity; hence, one founding team can contain entrepreneurs with different decision-making logics and, therefore, different and potentially conflicting decision outcomes (Alsos et al., 2019). Overall, combining causation and effectuation in new venture creation can imply the challenging reconciliation of planning and action, simultaneous reliance on both profit generation and experimentation, and blending consistency with improvisation (Andries, Debackere, & Van Looy, 2013;

Broun & Sieger, 2020; Futterer et al., 2018; Reymen et al., 2016). Yet, these views are rudimentary and have not received sufficient research attention. Therefore, how this reconciliation unfolds remains unexplicit. Moreover, in the extant effectuation literature, we observe a somewhat conventional view acknowledging that employing both logics concurrently has a positive effect on entrepreneurial processes (Andries et al., 2013; Laskovaia, Shirokova, & Morris, 2017; Reymen et al., 2015; Smolka et al., 2018). However, how entrepreneurs align different demands of causation and effectuation to reach this synergistic interplay are as yet unknown.

We problematize³ this synergy between effectuation and causation, and challenge the underlying assumption that it is statically present from the outset just because entrepreneurs follow both logics simultaneously (see e.g., Smolka et al., 2018). Considering the intrinsic differences between causation and effectuation (Sarasvathy, 2001), and accepting that the realm of any human organizing (such as new venture creation) is unavoidably hallmarked by decision-making inconsistencies, contradictions and paradoxes at multiple levels (see e.g., Ashkraft & Tretheway, 2004; Karhu & Ritala, 2020), we suspect the texture of the causation-effectuation interface is richer, far more complex, and dynamic. Precisely, we assume tensions between these logics, which, in turn, require reconciliation mechanisms to achieve their synergy. Therefore, we aim to address the following research questions: (i) *How do tensions between causation and effectuation occur in new venture creation?* and (ii) *How do entrepreneurs resolve tensions between causation and effectuation in new venture creation to achieve synergy?* We investigate 41 episodes of new venture creation undertaken by nascent entrepreneurs in Finland and Denmark, applying the diary method. Addressing this topic offers contributions to the effectuation research, and, specifically, to its stream examining the causation-effectuation amalgam (Perry et al., 2012; Reymen et al., 2015; Smolka et al., 2018). *First*, as a response to Read, Sarasvathy, Dew, and Wiltbank (2016), our study unpacks the simultaneity of causation and effectuation and investigates “whether this co-existence is harmonious and productive or conflicting and destructive” (Galkina & Atkova, 2019: 988). We advance existing knowledge by demonstrating that bringing causation and effectuation together can imply tensions between them, and attaining their synergy would demand resolving these tensions. *Second*, we move forward the understanding of complexity of causation-effectuation relations by showing that the tensions between them can occur at multiple levels. *Third*, examining causation-effectuation tensions also contributes to the literature on ambidexterity and reconciliation of exploitation and exploration activities (Andriopoulos & Lewis, 2009; Stettner & Lavie, 2014). Hence, our article acts in response to Raisch, Birkinshaw, Probst, and Tushman (2009) who call for spanning multiple levels of analysis when examining the ambivalence of exploitation-exploration interface. *Fourth*, adopting the process-based approach and applying the diary method, we offer a methodological contribution and answer calls to conduct more truly longitudinal real-time journaling studies to understand how effectuation (along with causation, in this study) unfolds (McKelvie, Chandler, DeTienne, & Johansson, 2019).

2 | THEORETICAL BACKGROUND

2.1 | Co-existence of causation and effectuation

Effectuation theory started to develop around the turn of the millennium (Sarasvathy, 2001; Sarasvathy, Simon, & Lave, 1998). It introduces effectuation as a means-driven non-predictive logic of entrepreneurial reasoning, in contrast with goal-driven causal logic. In her seminal article, Sarasvathy (2001) emphasizes that effectuation and causation are constantly balanced in entrepreneurial action, and the same person can employ both logics interchangeably depending on circumstantial uncertainty. Notably, the theory of effectuation does not present a better logic of reasoning but pluralizes the concept of rationality and describes non-predictive, non-teleological, and non-adaptive methods of decision-making (Sarasvathy, 2001; Wiltbank, Read, et al., 2009). The initial conceptual work around effectuation aimed to differentiate it as a distinctive and discrete entrepreneurial logic. This resulted in a deliberate and somewhat artificial juxtaposition of those dimensions as a dichotomy; in order to explain effectuation, scholars

have emphasized its strong contrast with causation. While some authors demonstrate their differences just by using the word “versus” (Dew, Read, Sarasvathy, & Wiltbank, 2011), “instead,” “opposites,” “inversion,” and others are more radical and see causation and effectuation as mutually exclusive types of reasoning (e.g., Brettel, Mauer, Engelen, & Kupper, 2012; Dew, Read, Sarasvathy, & Wiltbank, 2009). However, this contrast has led to an antagonistic view on the concepts, which spread into effectuation research during its first decade.

Further, Perry et al. (2012) expressed the idea of an orthogonal relationship between the two strategies. They argue that viewing causation and effectuation as the two ends of a continuum is a tempting but misleading perspective. Instead, they are two co-existing and coherent logics where high causation does not suppose a low level of effectuation, and vice versa. This means the opposite of causation does not imply effectuation. Accepting this idea of mutual non-exclusiveness, scholars have started to pay more attention to the simultaneity of the two logics. According to Matalamäki (2017), this has resulted in the emergence of a separate stream in the effectuation research, which focuses on the combination of the two types of reasoning. Below, we take a closer look at the studies in this direction.

2.2 | Causation-effectuation interplay: synergy or separation?

Research in this stream has aimed to investigate the causation-effectuation interplay. However, our closer examination of the research detects that the two logics are still shown as rather disconnected. *First*, we observe temporal separation of causation and effectuation, meaning that they are isolated in time. We believe this idea of their sequential relationship is inherited from the early effectuation studies, and related to high levels of uncertainty associated with the new venture development stage. Thus, in the early start-up stages when uncertainty is high, the venture goals have low specificity, relations with stakeholders have no structure or continuity, and decision-makers tend to employ effectual reasoning (Sarasvathy, 2001; Sarasvathy & Dew, 2005). In later phases, as the new venture moves from inception to growth, it obtains more resources and more stakeholders come on board. Under these more certain conditions, decision-making becomes more causal (Read & Sarasvathy, 2005; Sarasvathy & Dew, 2005).

Later research has also viewed the two logics occurring as alternate switching from one to the other. For example, Nummela et al. (2014: 547) emphasize their “parallel use” and identify the “alternating periods” where one logic dominates the other, separated by critical incidents causing the switch. Other authors put the interplay of causation and effectuation into the context of new product development and innovation (Berends, Jelinek, Reymen, & Stultiëns, 2014; Sitoh et al., 2014). Their results also demonstrate switching from one logic to the other, and that effectual decision-making in the earlier stages of product innovation shifts to causation at the later stages of the process. For instance, Sitoh et al. (2014) show that along the stages of conceptualization, prototyping, production, and marketing, the decision-making configurations can vary in their intensity of effectuation and causation. Thus, effectuation dominates in the conceptualization and marketing phases, whereas causation prevails in prototyping and production. In a similar vein, Reymen et al. (2015) set out to explore the simultaneity of causation and effectuation in strategic decision-making in new ventures. However, they still see causal and effectual as independent processes, and identify turning points where one logic replaces the other. This dominance of one logic over the other depends on the level of perceived uncertainty, stage of venture development, resource position, and external pressures from stakeholders. Maine, Soh, and Dos Santos (2015) examine entrepreneurial decision-making modes, revealing analogous iterative shifts from causation to effectuation and vice versa. Even though they claim to evidence a combination mode that involves characteristics of both causation and effectuation, they do not discuss in detail exactly how this combination manifests.

Second, causation and effectuation can be separated in relation to different tasks and/or business functions, even though are applied at the same time. Thus, Yang and Gabrielsson (2017) show the content of some marketing tasks and procedures requires more effectual thinking (e.g., new product development), while other tasks demand more causal reasoning (e.g., maintaining the existing customer base). Likewise, Brettel et al. (2012) suggest that in the corporate setting, a preference for effectuation or causation depends on the degree of innovativeness of the

corporate process/function; thus, effectuation is likely to be observed in tasks requiring a high degree of innovation. Also, Nummela et al. (2014) state that product- and technology-related decisions of internationalizing firms tend to be more causal, whereas market-related decisions encompass more effectuation.

Adopting a business-model perspective, Reymen et al. (2016) found that effectuation is used primarily to develop business-model components, such as value proposition and developing a specific market segment. Causation, in turn, is employed to develop cost structures, key resources, and activities, and often also value propositions and customer segments. If a shortage of resources emerges, firms switch back to effectuation logic. In a similar vein, Futterer et al. (2017) reveal the effectiveness of both causation and effectuation for business-model innovation. They show causation is more effective when innovating value-offering architecture and deciding what shall be offered to which customer. Effectuation, in turn, is more effective when innovating the external value creation architecture (e.g., establishing commitments with external stakeholders). A similar logic of parallel use or separation is seen in Baber, Ojala, and Martinez (2019), who indicate that in the process of business-model transformation, some business-model elements (such as specific product/service aspects) tend to be changed following effectuation, and others (such as value delivery) are modified applying causation. Importantly, the separation of causation and effectuation in relation to various tasks can also lead naturally to their separation in an organizational space. For instance, Galkina and Lundgren-Henriksson (2017) posit that in the coopetition context, the deployment of effectual and causal logics occurs at the same time but at different managerial levels.

We have paid special attention to the studies that claim to examine the synergy between causation and effectuation. Given the emphasis on interaction in synergistic relations, we expected these studies to show the actual interactivity and symbiosis mechanisms between the two logics. In this regard, the most cited work is that by Smolka et al. (2018); they conclude that the two logics are mutually reinforcing, and their simultaneous deployment has an interactive, positive affect on venture performance. Even though they emphasize the interaction between causation and effectuation, strikingly their point of departure is that “within any new venture, specific business functions require different [causal or effectual] approaches” (p. 8), and that “entrepreneurs or entrepreneurial teams are able to switch from one decision logic to the other” (p. 9). Hence, this still implies that causation and effectuation are separated in time, or in relation to different tasks, and does not reveal an interaction. The ultimate question is can this be called a synergy, if no nuanced interaction between the two logics is identified? Certainly, the important contribution of the quantitative study by Smolka et al. (2018) lies in identifying this synergy, but how it is attained remains unclear.

Other studies that claim to examine causation-effectuation synergy and/or hybridity also do not go much further. For instance, Laine and Galkina (2016) indicated that iterative shifts from one logic to the other can be detrimental; they recommended using both at the same time for firms to survive in turbulent institutional conditions, but did not specify how. Laskovaia et al. (2017) drew an analogous conclusion; even though they showed that both cognitive logics have a positive effect on new venture performance, it remains unclear how entrepreneurs blend causation and effectuation, and exactly what happens when the two logics overlap. Lingelbach, Sriram, and Mersha (2015) examined the impact of causation and effectuation on firms' innovation processes. They revealed that both logics can be present simultaneously to a great degree along the processes; however, the authors did not investigate the exact mechanisms of how the logics are intertwined.

In addition, efforts have been made to find explanations for causation-effectuation hybridity at the level of the individual entrepreneur. In this regard, Smolka et al. (2018: 21) introduced the notion of a “planning effectuator,” a decision-maker who benefits from both experimenting with and designing business strategies. However, their quantitative approach did not reveal how that combination unfolds in one decision-maker. In a similar vein, Alsos and Clausen (2014) unveiled the category of “ambidextrous entrepreneurs” who employ both logics during the start-up process; however, their findings also did not provide details on how the logics are mixed in one entrepreneurial identity. Also, the ambidextrous use of causation and effectuation is examined in the study by Broun and Sieger (2020); they find family financial support to be an important antecedent for applying both logics but do not depict their actual interactivity.

We have identified only two studies that detect some venturing activities with true synergistic hybridity inseparably combining the elements of both causation and effectuation. First, Andries et al. (2013) showed that instead of committing to one business model, entrepreneurs may look to various directions and develop divergent search paths. The authors called this learning strategy “simultaneous experimentation,” an activity that combines effectual experimentation with means, causal planning, and the selection of business model experiments, thus balancing action with planning. The second example of inseparable hybrid use of causation and effectuation was described by Galkina and Atkova (2019). They demonstrated that along the process of scanning for effectual means, entrepreneurs ask not only what they have, but also what they do not. This naturally leads to a causal goal orientation, and transforming means into resources, because entrepreneurs start deliberately thinking about what they should do to get what they do not have. While we acknowledge the importance of these findings to understanding the causation-effectuation amalgam, both works dealt with only a fragment of the inter-relationship, namely the interaction between causal goals and effectual means. Hence, how the other elements of causation and effectuation can be blended into one activity remains underexplored. How, for example, can entrepreneurs simultaneously estimate returns and follow the affordable loss principle, or avoid surprises and at the same time leverage contingencies?

Generally, the above discussion shows that many studies present the mixture of the two logics as “shaken not stirred.” This quasi-interplay is twofold. Causation and effectuation either coexist through sequential switching and alternation (rapid and regular, or slow and random), but are still separated in time, or they are simultaneous but independent and disconnected in relation to different tasks/problems and/or organizational space (managerial levels). Hence, these studies say little about the actual interaction of these two logics, and what happens when they are mixed into true “effecausal” hybridity. Even the studies on causation-effectuation synergy still view the synergy as the result of the separation or parallel use of the two logics; so, what happens on the way to this synergy between the two logics remains unclear. Also, the existing studies predominantly see the positive effect (on marketing performance, new product development, business model innovation, internationalization, new venture performance, etc.) of combining the two logics. However, several studies point out that this positive influence is only one part of the “story” of causation-effectuation interplay, and that there can be tense relations between them.

2.3 | Tensions between causation and effectuation

Research in this direction is very rudimentary, and does not explicitly discuss causation-effectuation tensions; however, there is some extant evidence pointing to their existence. For example, these tensions can be observed between effectual start-ups and investors, who tend to be more causal. Studies show that investors and venture capitalists often follow causal reasoning and make their decisions based on predictive information, whereas entrepreneurs act more effectually; hence, both sides “share little common ground” (Read & Sarasvathy, 2005: 59) and can experience task-related conflicts (Appelhoff et al., 2016). This variance in decision-making logics of investors and entrepreneurs is caused by their different interests in influencing how a venture is created (Wiltbank, Sudek, & Read, 2009). This may force entrepreneurs to behave more causally in uncertain situations, where they would otherwise act effectually (Frese et al., 2019). Similarly, business incubators are likely to adopt a causal approach in selecting tenants, and work with candidates who have rigorous business plans and a predefined business model (Brun, 2016). Also, incubator advisors may enforce causal activities to otherwise effectual entrepreneurs along the incubation process (Brun, 2019). Hence, a business plan as an entrepreneurial artifact is often a causally developed facade that may not reflect the possible effectual logic behind it. The potential for tensions between two decision-making styles can also be explained by the fact that founding teams include entrepreneurs with potentially different logics and preferences for actions (Alsos et al., 2019).

The studies above propose, despite its benefits, that the combination of causation and effectuation can create fertile ground for tense relations. Stemming from the main differences between causation and effectuation (Sarasvathy, 2001, 2008), the combination of the two logics implies an ambivalent use of its main principles. First,

this would suppose the mixed activity of setting concrete goals and specifying steps to reach them, with, at the same time, decision-makers scanning for and starting from their available means at hand (What I am, What I know, Who I know), and experimenting with them under uncertainty. Second, a causal reliance on pre-existing knowledge (e.g., a particular technology; sources of competitive advantage) and developed plans would co-exist with leveraging contingencies, surprising situations, and unexpected outcomes, to be exposed to opportunities. Third, while forecasting estimated returns and probabilities of risks, the decision-makers would, at the same time, mentally account for their own ability and willingness to stake and lose assets in the worst-case scenario. Fourth, the combination of both logics would mean conducting extensive market research while relying on information gained through networking with any and all self-selected stakeholders. Finally, causal predictive control of the future would co-exist with non-predictive control through the “pilot-in-the-plane” principle.

Thus, decision-makers simultaneously following the very different logics of causation and effectuation can, naturally, experience contradictions and conflicting demands. Indeed, developing the capability, on the one hand, to make plans, design the future intentionally, and be reliable, credible, consistent, and focused on profit and process alignment (characteristics associated with causation), and, on the other hand, to explore and adapt to unfolding unpredictable reality, and demonstrating flexibility, innovativeness, the ability to improvise, experiment and be agile, focused on breakthrough and process adaptability (characteristics associated with effectuation), can be problematic and controversial. However, the extant literature has not examined these tensions between causation and effectuation. We posit that without a thorough understanding of the nature of these tensions at multiple levels, and how to overcome them to achieve synergy, our knowledge of causation-effectuation interplay is incomplete. Therefore, we address this gap in our empirical study.

3 | METHODOLOGY

3.1 | Rationale for choosing the diary method

New venture creation represents a suitable context in which to study causation-effectuation interactions, because it blends goal-orientation, prediction and planning, capitalizing on contingencies and uncertainty (Andries et al., 2013; Futterer et al., 2017; Shepherd, Souitaris, & Gruber, 2020). Because any decision-making process is closely interrelated with and reflected in action (Kitajima & Toyota, 2013), capturing tensions between causation and effectuation is possible by grasping that action. In turn, the primary mechanism for communicating action is language, both written and oral (Torbert & Taylor, 2008). A written diary is one of the ways to document and depict actions. Zimmerman and Wieder (1977) define a diary as an annotated chronological record or log that captures actions in a way that is not possible using conventional designs (Bolger, Davis, & Rafaeli, 2003). The diary method allows to track different decisions in the process of venture creation, and to identify tensions between different decision-making logics, by posing a set of specific questions and triggering the reflective thought process. It also mitigates the problems inherent to retrospection, as a diary enables a reduction in the time elapsed between the moment an action occurred or a decision was made, and its recollection (Zimmerman & Wieder, 1977). In other words, a diary enables the collection of live data and moving with an informant in time (Langley, 1999), and allows us to reveal patterns and regularities critical to this research (Bolger et al., 2003). In this regard, our diary method resembles regular journaling, which is recommended for capturing real-time decision-making in effectuation research (McKelvie et al., 2019).

3.2 | Study setting

Miles and Huberman (1994) emphasize that sampling strategy should logically follow a study's theoretical framework and research questions. As this study is conducted in the context of new venture creation, start-up accelerators were

considered a relevant context given the nature of their activities and goals. The start-up accelerator program is an intensive program aimed at the practical coaching of new entrepreneurs in developing their ideas into a product and commercializing it. Hence, the new ventures were being created but not legally founded as firms yet.

Data collection ran from September 2015 to June 2017; the access to entrepreneurs going through the process of creating their ventures was attained through two start-up accelerator programs in Oulu, Finland (<https://nestholma.com/collaboration-programs/oulu-startup-accelerator/>), and Ålborg, Denmark (<https://www.sea.aau.dk/students/startup-program/>). Altogether, we followed 41 new venture creation episodes, that is, 41 start-ups at the pre-legal stage containing from one to five entrepreneurs. Following Jiang and Ruling (2019: 173), an episode is “a sequence of events marked by a beginning and an ending point.” In this study, an episode contemplates the development of one business idea (a new venture to be); the starting points of the episodes corresponded with the entry of entrepreneurs into the accelerator programs, and the end-points corresponded with their exit from these programs. Depending on the schedule of the start-up accelerators, entrepreneurs participated in the programs for three-six months; the data collection period and the time of their participation in the accelerator programs coincided. The programs involved business ideas aimed for various industries; however, to ensure data homogeneity we selected entrepreneurs who developed their ideas for the software, mobile application, or digital health-tech industries (see Appendix A).

3.3 | Data collection

The data collection process started with the development of the diary questions (see Appendix B). These were formulated to grasp the causation and effectuation processes, and reveal possible tensions between them (Perry et al., 2012; Reymen et al., 2015; Smolka et al., 2018). Answers to the same questions over a certain period of time explicate how certain parts of a new venture develop simultaneously, revealing entrepreneurial decision-making processes and their associated tensions. Stemming from the studies pointing to the inevitable interplay of causation and effectuation in new venture creation (Andries et al., 2013; Futterer et al., 2018; Reymen et al., 2016), and research pointing to potential tensions between the two logics (Appelhoff et al., 2016; Frese et al., 2019; Wiltbank, Read, et al., 2009), we supposed these tensions were also unavoidable in our context of new venture creation, and, hence, possible to observe. The diary questions were open-ended, allowing us to capture how the new venture creation process unfolded through actions and decision-making.

Traditionally, diary studies imply a pen-and-paper format, which among other drawbacks involves a high risk of informant loss. Furthermore, a paper diary is not necessarily available to write in when the respondent would wish to, whereas digital diaries can be accessed easily from any mobile communications device, and are easily searchable and readable. More importantly, the digital diary format enables the use of special software for further analysis. Given the above, the diary was converted into digital format using the Webropol online platform. Later, a link to the diary was circulated among the participants.

Prior to starting the diary entry procedure, the participants were briefed on the diary logic, and how to work with the diary, which itself contained instructions detailing the technical aspects of making the entries. Among others, the instructions detailed how often diary entries should be made, where to write the answers, and examples of what those could cover (e.g., thoughts, feelings, emotions, descriptions of activities, decisions, etc.). The respondents could write anything they felt appropriate. Additionally, we provided a special glossary explaining the meaning of the vocabulary used in the diary, ensuring the researchers and the participants understood the concepts in a similar way, strengthening the study's validity and reliability.

The diarists were periodically sent reminder and thank-you e-mails to ensure the regularity of entries and motivate long-run participation in the study. The e-mail channel was also used for any questions the participants might have regarding the diary itself or how to make entries, and the e-mail conversations served as an additional source of data.

We tracked the participants through their regular electronic diary entries over the data collection period's time span. Entrepreneurs were asked to answer diary questions every other week over a period of three-six months. Each episode comprised three-six diary entries, and a single entry corresponds to a data collection point (see Appendix A). The respondents could choose to make more frequent diary entries, if there were important developments in the business modeling. Also, they could skip entries, if they felt there was nothing worth noting. Overall, the number of diaries corresponded with the number of studied episodes. The length of each diary ranged from 10 to 15 pages; they provided us with 533 pages and 266,500 words of diary data.

3.4 | Data analysis

Qualitative research is enacted with words, “which are ‘fatter’ than numbers,” implying they can convey multiple meanings (Miles & Huberman, 1994: 56). Because coding is a process that allows data to be extracted, grouped and connected in order to grasp their meaning (Grbich, 2007; Saldana, 2009), it is considered the most appropriate technique for the purposes of this research. We followed the “Three-Cs” approach to trace the sequence of codes, categories and concepts (Lichtman, 2013: 251). Hence, we grouped codes into more general categories and then moved from categories to key concepts or themes allowing the meaning of the collected data to be distilled (Lichtman, 2013). According to Richards and Morse (2007: 137), identifying key themes is the last step when moving from the data to an idea.

The first step in the data analysis was to develop codes to recognize causation and effectuation in the data. Without this recognition of the two logics, further analysis of their interplay would not have been feasible. Miles et al. (2014: 71) define codes as “labels that assign symbolic meaning to the descriptive or inferential information compiled during a study.” Lichtman (2013) distinguishes between two types of codes: those defined *a priori* and those that emerge from the data. In this research, the existing conceptualization of effectuation principles (means orientation, affordable loss, co-creation partnership, leveraging contingency, co-created future), and causation principles (goal orientation, expected return, competitive analysis, avoid contingency, predictive future) (see Dew et al., 2009; Sarasvathy, 2001, 2008), provides the theoretical foundation to employ an *a priori* coding strategy. We also followed Fisher's criteria (2012) to identify causation and effectuation in the data. Further, we developed emergent codes as the data analysis progressed (see Figure 1). They represent emergent themes and categories that arose repetitively throughout the data. They also provide the basis for the new topics in the data analysis, and guide our further inductive inference and concurrent theoretical conceptualization of the tensions between causation and effectuation, as well as pave the way for the study's contribution (Saldana, 2009).

We utilized NVivo (version 11) for analysis, and once coding for all the diaries was completed, the codes were combined into the categories using the query function. This software tool enables the identification of all the content coded at a certain node. In turn, the categorization process illuminated the key themes related to the tensions between causation and effectuation (see Figure 1). To ensure multiple interpretations, all the authors were involved in the data analysis.

4 | FINDINGS

Our data allowed us to capture how the studied entrepreneurs employed the principles of causation and effectuation during the venture's creation, and to illuminate the tensions that emerged along their simultaneous use. We organize the presentation of our findings around five principles of effectuation and the respective principles of causation (Sarasvathy, 2001, 2008). The diary entries with the greatest illustrative power are discussed in the text, while comments that are more evidential in nature are presented in Table 1.

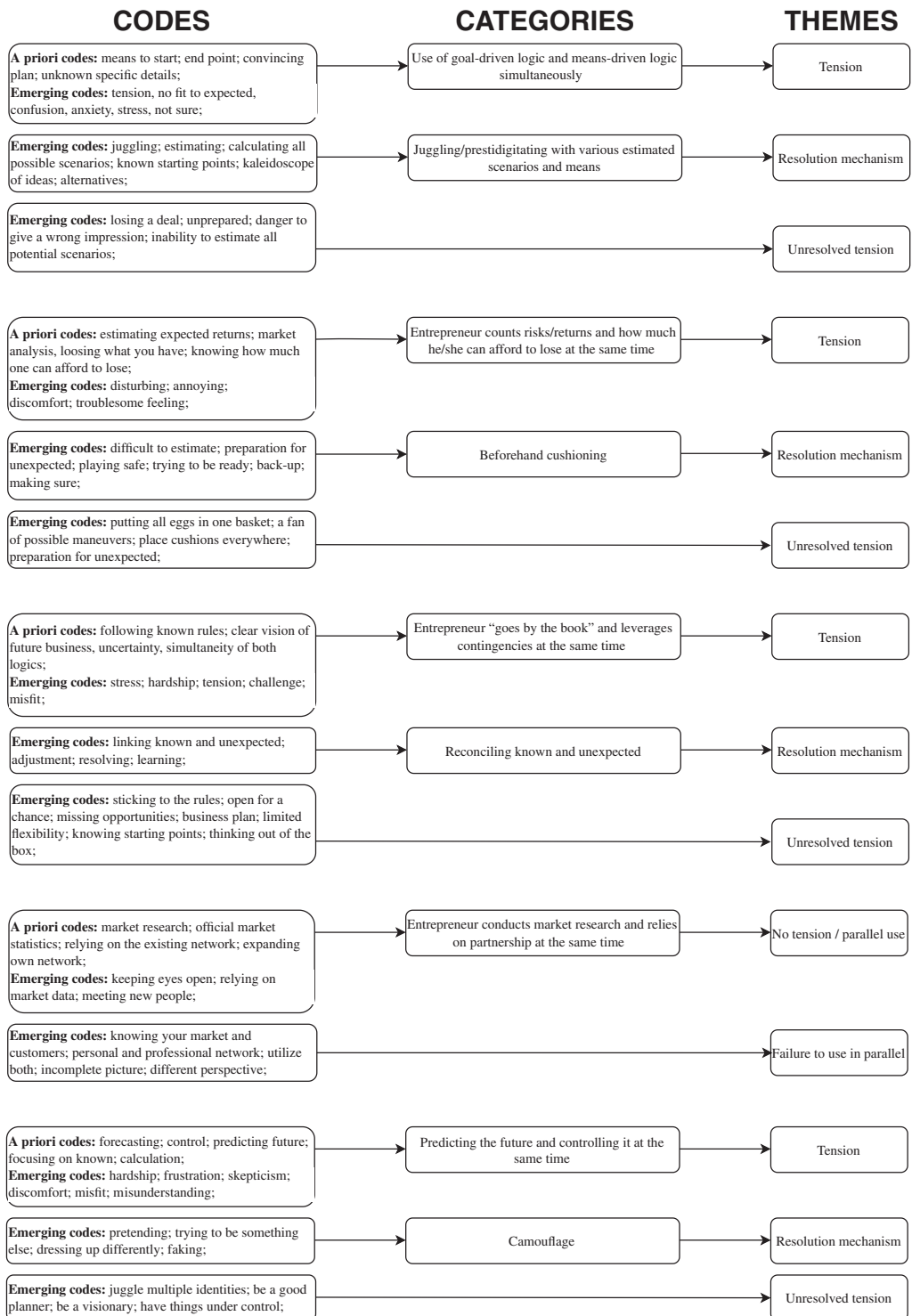


FIGURE 1 Data analysis

4.1 | Simultaneous use of goal-driven and means-driven logics

Our data reveal that the studied nascent entrepreneurs simultaneously employing means-driven and goal-driven logics experience various tensions resulting from the contradicting demands each of the logics requires. In the following example, entrepreneurs admit that the requirement to have a formalized marketing plan instead of an array of unwritten future scenarios developed from the available means made them feel unreliable and that they were not meeting the expectations of a potential stakeholder. At the same time, the entrepreneurs acknowledge that following a set-in-stone plan did not fit their working style:

Episode 3: “When we were at the meeting with Company Z, they asked about a marketing plan for our product. I mean we have it somewhere in our minds, but not a formal written one that we follow. I'd rather say we have several scenarios depending on what we have. We just don't work this way. It's not our style. But without it, we didn't look reliable, and I felt the conversation got tense ... we were not meeting expectations. We had to come up with at least some kind of marketing plan.”

This example shows the tension between the two decision-making logics occurring at the inter-organizational level; however, its roots can be traced back to the organizational level. The inter-organizational tension is caused by the variation in the document management processes of the potential stakeholder company and the start-up entrepreneurs. Yet, the variation itself can be linked to the difference in the nature of the working styles of the entrepreneurs in the founding team.

Our data also reveal a specific mechanism the entrepreneurs used to overcome the tension arising from following both means and goals. Interestingly, this mechanism organically combined the elements of two logics leading to their synergistic effect. In the excerpt below, the entrepreneurs highlight that they tried to calculate all possible future scenarios of the venture creation process; and, they evaluated this strategy as productive for creating their ventures. Hence, they synergistically combined the elements of both causal and calculated prediction with reliance on what they had at hand. Driven by the exact words used by our informants, we term this mechanism *juggling with means and various estimated scenarios*. The data excerpt supports our findings:

Episode 18: “At this point, many things are so emergent. We only know the starting points, but there are so many possible scenarios we have to think through. We try to juggle ... and make specific estimations in each direction. It seems to work and is productive. So, we not only know and rely upon on what we have, but also calculate all possible scenarios. I think the success of our venture depends on how well we do this.”

Notably, our data also demonstrate that the tensions between means- and goal-driven logics can remain unresolved. In the following example, the entrepreneurs envisage a potential situation, a likely course of action, and possible consequences should they fail to combine the logics or do not acknowledge the emerged tension:

Episode 23: “...of course it's impossible to think through all of the possible scenarios. But if you don't convince your potential partners that you can think in several different directions, be strategic in all potential and even imaginary plans, then you will lose a deal.”

4.2 | Simultaneous calculation of returns and estimation of affordable losses

Our data demonstrate that tension between causation and effectuation can also arise when an entrepreneur tries to focus on both calculating potential returns and assessing how much they can afford to lose. In the following example,

TABLE 1 Evidence quotes from the diaries

Tension	Codes	Resolution mechanism	Code	Unresolved tension	Code
1. Use of means-driven logic and goal-driven logic simultaneously Episode 7: "I feel very confused and even anxious when people ask me about all the specific details of our business. We're so early in the process that the end result is only being shaped. We only know the starting points." Episode 21: "At the moment we're working on developing a minimum viable product. Without it, it would be very difficult to convince potential Venture Capitalists to invest in us. We feel very stressed because we are required to present an MVP, but we're not yet sure what set of features it will have in the end." Episode 40: "You have to be brave and be ready for the constant feeling of stress, because you often have to promise things in advance that do not yet exist."	A priori codes: Means to start End-point Convincing plan Unknown specific details Emerging codes: Tension No fit to the expected Confusion Anxiety Stress Not sure	Juggling with means and various estimated scenarios Episode 22: "Building a new start-up is not a straightforward process. I usually have some kind of a kaleidoscope of ideas in my head, and I try to figure out which one would work out. It's more efficient to have options to choose from; it increases chances for success." Episode 15: "Availability and access to myoma tissue is currently one concern. We know that we need it; without this tissue, we won't be able to develop our product. But there is currently no real update to the regulatory issues related to commercial use of tissue in these types of product. So, we're trying to estimate other possible steps/alternatives to get it; this is the most effective way to deal with this."	Emerging codes: Juggling Estimating Calculating all possible scenarios Known starting points Kaleidoscope of ideas Alternatives Productivity Efficiency Effectiveness Success	Episode 8: "I remember that during this meeting our potential investors kept asking 'What if..., what if...'. I need to admit that we were not able to answer all their what-ifs. We were not even thinking in that many different ways. Next time we need to be more prepared." Episode 38: "When you show that you can think of plan A, B, C, D, it shows that you're ready for the unexpected and open to opportunities if things don't go in a certain direction. If you don't show it, if you show only one way, then you risk looking too naive and optimistic."	Emerging codes: Inability to estimate all potential scenarios Losing a deal Unprepared Danger of giving a wrong impression
	A priori codes: Estimating expected returns Market analysis Losing what you have	Beforehand cushioning Episode 13: "I wish we were prepared for this situation, had some back-up plan ... No one	Emerging codes: Difficult to estimate Preparation for the unexpected	Episode 9: "We had to make sure we had proper finances before	Emerging codes: Putting all your eggs in one basket
	2. Entrepreneur counts risks/returns and how much he/she can afford to lose at the same time				

TABLE 1 (Continued)

Tension	Codes	Resolution mechanism	Code	Unresolved tension	Code
Episode 39: "Next week, we're having a meeting with the potential angel investor. We know we should include as specific market calculations as possible. It is a must to show that we know the market. But what makes us feel uncomfortable is that these numbers are only speculations; we can only know exactly what we have invested..."	Knowing how much you can afford to lose Emerging codes: Disturbing Annoying Discomfort Troublesome feeling	expected that the whole idea might go bust." Episode 15: "We're thinking through different solutions. If one thing doesn't work out, hopefully the other will. You have to be ready for a rainy day in order to sustain company performance."	Playing safe Trying to be ready Back-up Making sure Effectiveness Back-up plan Performance Successful venture	we started to develop our business further." Episode 3: "Building a start-up is a roller coaster: you can't know exactly where the next turn will take you. But you have to be prepared for any potential pitfalls. If you don't do your homework properly, the reality will hit you hard."	A fan of possible maneuvers Place cushions everywhere Preparation for the unexpected
Episode 26: "Now my wife is the only bread-winner in the family. To start this business, I had to quit my job, so I know exactly how much we've already lost in terms of our income. And we still don't know whether it will pay off; this really troubles me!"		Episode 8: "We need the help of an investor to finance the development of our app because we're not able to gather the money needed to do the back-end and front-end development. I wish we'd thought about it earlier and had an alternative plan; A successful venture needs this."			
3. Entrepreneur "goes by the book" and leverages contingencies at the same time	A priori codes: Following known rules Clear vision of future business Uncertainty Simultaneity of both logics Emerging codes: Stress Hardship Tension Challenge Lack of fit	Reconciling the known and unexpected Episode 30: "...it's like in anything ... it doesn't relate just to running a company, developing business models ... you always need to learn, constantly ... to add new knowledge to what you already have and know, even though they may be contradictory. Old knowledge	Emerging codes: Linking the known and unexpected Adjustment Resolving Learning Improved performance New solutions Successful launch	Episode 23: "If you want to think outside of the box, first you need to know what box you're looking out from. You need to know both your starting point and the possible ways to get what you want." Episode 11: "Learning how to write a proper business plan is of	Emerging codes: Sticking to the rules Open to a chance Missing opportunities Business plan Limited flexibility Knowing starting points Thinking out of the box
Episode 32: "Participating in this program requires a very structured approach and discipline, following known rules ... like you have to have a business plan at the end [of the program]. But at the same time there are so					

(Continues)

TABLE 1 (Continued)

Tension	Codes	Resolution mechanism	Code	Unresolved tension	Code
many unexpected things we have to deal with... If one person, one entrepreneur like me, has to deal with both, following the business plan and at the same time be on the lookout ... it can be very hard and stressful."		is the necessary basis, but exploring new things keeps you going forward ... In most cases, new information and experience challenges and shakes your knowledge, but it improves your business performance and will lead to successful launch. If you fail to link them, you lose. If you don't learn, you won't succeed...."		course a necessary skill, but at the same time I feel that it limits my thinking to a certain path. It doesn't give much freedom to be inventive or creative, neither has it space for some unexpected things that are so frequent when you're just starting your business. And in my opinion, if you're not flexible in your planning, especially at the beginning, you can lose or not notice valuable opportunities."	
Episode 4: "At the beginning, we developed a clear view of how our journal should look; we followed existing examples. But our current challenges lie with the work of our volunteers, as they are competent writers with their own creative ideas and ideals of writing, which didn't fit the strategy and started to shape the magazine more than the founders have done so far."		Episode 24: "I make decisions based on my knowledge and experiences ... on what I already know. But our business is still so uncertain, new things are always appearing, and they may totally contradict how I made my decisions before. It's precisely through the difference between old and new things that I come up with new solutions."			
4. Entrepreneur conducts market research and relies on partnership at the same time	A priori codes: Market research Official market statistics Relying on the existing network Expanding own network Emerging codes: Keeping your eyes open Relying on market data Meeting new people	No tension/parallel use Episode 14: "To do our best and succeed, we try to use all possible channels to get an idea of our market. We constantly gather information from our network and regularly check market information, as it definitely	Emerging codes: Relying on both market research and networking Balance No tension Succeeding Effectiveness Added value Market share	Failure to use in parallel Episode 12: "It happens frequently that official market statistics give you one picture but when you start talking to the 'man on the street' or to the people you know, you get a totally different	Emerging codes: Knowing your market and customers Personal and professional network Utilize both Incomplete picture Different perspective
Episode 9: "Keeping your eyes open and working with your network is as important as relying on market data and official statistics."					

TABLE 1 (Continued)

Tension	Codes	Resolution mechanism	Code	Unresolved tension	Code
Episode 17: "Even though we did a lot of market research before we started, I still have the good habit of trying to meet at least one new person every day, just to expand my opportunities."		adds value to the product we develop." Episode 27: "I attend various entrepreneurial events to pivot our business and validate our ideas; but I also try to crunch some numbers from time to time. It helps to understand our real market share."		perspective. It's very important to come to grips with both perspectives, otherwise you can be totally wrong in your ideas for future business development." Episode 39: "As an entrepreneur, I always keep my eyes open... to all information, no matter whether it's official market statistics or some informal information from a friend who's an insider in an industry. Otherwise, you limit yourself."	
5. Predicting the future and controlling it at the same time	A priori codes: Forecasting Control Flexibility Work in progress Predicting future Focusing on the known Certainty Fixed In the making Emerging codes: Hardship Frustration Skepticism	Camouflage Episode 18: "Often, to look credible, we even had to dress differently for these meetings, like trying to be something else, look like we have a perfect plan and know exactly what to do." Episode 31: "...but we need to pretend we know exactly the end-point. It's exactly like how many entrepreneurs say 'Fake it till you make it.' It seems to work and be effective, so	Emerging codes: Pretending Trying to be something else Dressing up differently Faking Credibility Effective Workable strategy Success of a new venture	Episode 7: "When we met with the business angels, the reality hit us hard. As a team we are very creative and work with multiple ideas; often it looks like a mess. At the moment, there's not much that we can control as our business is just evolving, but the investors want a very clear picture of what	Emerging codes: Juggle multiple identities Be a good planner Be a visionary Have things under control

(Continues)

TABLE 1 (Continued)

Tension	Codes	Resolution mechanism	Code	Unresolved tension	Code
than focusing on forecasting, I try to make space for the unexpected and focus on what we already have.”	Discomfort Lack of fit Misunderstanding	success of a start-up often depends on a bit of faking.”		will happen in the future. And if you don't have this convincing picture, you don't get any money.”	
Episode 13: “We need to look solid, credible, like a mature firm that is controlling its future ... But everything's just a work in progress. Otherwise we won't meet expectations and it can cause misunderstandings. Of course, I believe we have potential, but we have just started...”					
Episode 9: “Our company is very young ... we experiment a lot ... with our product, our customers ... and everything is in the making, it's constant validating and trying different ways. But our partners want this certainty and confidence ... that everything looks fixed, not risky, and planned in advance ... because they have their processes in shape and need this to fit into their operations.”					

the entrepreneurs were disturbed by the necessity to calculate future profits, as market uncertainty can jeopardized any prediction, and it made more sense to evaluate what could potentially be lost without serious consequences. The diary entry points to the discomfort the entrepreneurs experienced, and illustrates the inter-organizational tension caused by the requirements of the accelerator program on the one hand, and uncertainty the start-up entrepreneurs experienced with regard to the potential future returns on the other.

Episode 13: “Of course, in the program we need to estimate potential market size and returns, and know of existing competitors. We need to provide some realistic numbers. But what's disturbing and annoying is that at the same time you can never be sure what the market will bring you, all you can know for sure is the idea that you can lose all that you have invested.”

Our data unveil that where this tension existed, entrepreneurs resorted to a mechanism of *beforehand cushioning*, in a natural attempt to resolve the tension. In the following example, the entrepreneurs explained that market estimations could be misleading and actual profit might not correspond to the calculations. The entrepreneurs advised preparing in advance for a situation where a new venture generated much less profit or none at all. In short, it implies that the entrepreneurs succumbed to simultaneously calculating the expected returns and estimating an acceptable loss, and prepared for a situation where the expected returns were not realized. They admit that this way the chances of their new venture success were higher, which points to the synergistic effect of this hybrid use of the elements of both causation and effectuation:

Episode 17: “It's difficult to estimate precisely how much you will get. It can be that you get much less than expected...or even nothing at all, and we have to be prepared for that... If possible, it's good to place cushions everywhere you might fall. For example, we negotiate with several venture funds at the same time, in case some of them don't work out ... This way we increase our chances for success, our business productivity and reliability ... we want to play it safe.”

The entrepreneurs also work through different consequences that might be realized were a tension not properly resolved and no causation-effectuation synergy established. In the following example, they warned that if all the eggs were put in one basket, business activities might become uncontrollable and the entire venturing process fail:

Episode 23: “Not putting all your eggs in one basket ... that's how all wise entrepreneurs need to think. Running a start-up is like dealing with a fan of all possible maneuvers. If you don't do it, things will get beyond your control and the business will fail.”

4.3 | Simultaneous use of pre-defined knowledge and leveraging contingencies

Our study demonstrates that another tension between causation and effectuation becomes apparent when an entrepreneur tries to simultaneously go by the book and build upon emerging contingencies. The following example shows the entrepreneurs facing the challenge of integrating the unexpected into the previously agreed plans. In this excerpt, they admit that following prescribed rules and taking into account unexpected situations can be rather stressful and generate tensions among the founding entrepreneurs. Here, the tension can be traced to both the organizational and individual level. Its source is the difference in entrepreneurial identities and proclivity to use a specific decision-making logic. The necessity to combine alternative decision-making logics provokes resistance among entrepreneurs. At the same time, at the individual level, they need to integrate pre-defined and emerging knowledge along new venture creation:

Episode 40: “Even though I'm a more experienced entrepreneur than others in our team, I'm quite messy and less structured. Others seem to like planning more than I do. And sometimes it causes tensions in the team, they want me to follow what is decided, too, but things are changing so fast that often plans don't work out and you have to maneuver and re-focus.”

To deal with this tension, entrepreneurs resort to *reconciling the known and unexpected* in an attempt to overcome the tension. In the interview response below, they analyzed two market studies and concluded that the size of the market was much smaller than previously estimated. To manage this contingency, the entrepreneurs developed a compromise alternative, wherein a company could organize its operations in a digital space. The compromise reflects the synergistic use of causal and effectual decision-making logics that allows new-venture efficiency and chances to start the business successfully:

Episode 13: “Based on recent market studies and what we know now, the market size for this type of product is smaller. And this was unexpected for us. It could be that the total market size is less than 20M€, although based on our earlier analysis we were expecting it was at least three times bigger. A start-up for this sized market may not be realistic. To deal with this it needs to function as a virtual company, which would be more efficient and allow us to launch successfully...”

Even though following two different decision-making logics is stressful, the entrepreneurs admitted the beneficial aspects of being able to reconcile the known and unexpected. Therefore, in the following excerpt, they emphasized that an inability to leverage contingences, leaving the conflict unresolved, could lead to missing new business opportunities and curbing company growth:

Episode 16: “Sticking strictly to the rules and avoiding the unexpected may not serve you well. Of course, very often you just have to follow the rules, like when doing your budgeting. But you have to also be open to a chance, as it can open up new business opportunities or bring you new customers. If you're too much in your ‘box’ you can miss all this.”

4.4 | Simultaneous conducting of market research and reliance on partnerships

Our study has not revealed any specific tension emerging from the concurrent combination of conducting market research and gathering official statistical information, with the inputs received from various partnerships and networking activities. The studied entrepreneurs were able to organically utilize the available market data and research, as well as resources from various personal and professional networks. The examples below illustrate that entrepreneurs tried to collect as much existing information as possible, utilizing diverse sources to further develop the business. Additionally, they relied on networking relations, and used them as a reference to enhance their own credibility in the eyes of potential investors. Notably, the entrepreneurs viewed these as separate but complementary actions that supported each other and enabled the improvement of company credibility and reliability:

Episode 39: “...we continuously do market research based on available market statistics. We also hit the streets and asked people at random what they thought of our idea. But we also ask the people close to us, like family, friends, former colleagues ... how they could help us develop our business. So, we utilize information from all possible sources, where one task strengthens and supports the other.”

Episode 28: “To look more credible and reliable to VCs, we not only present statistical market research but also show our partners and people we work with. These are still different sources but supportive....”

Further, the entrepreneurs also pondered the possible consequences of not conducting market research and utilizing network relations in parallel, such as failing to have a complete picture of their business positioning and, as a result, unsuccessful start-up:

Episode 3: “You have to do your homework and know your market and your customers well, otherwise you run into the danger of developing a useless product or service. And personal or professional networks can be of great help here. If you don't utilize both sources of information, you'll get an incomplete picture of where your business stands in relation to your competitors and may end up failing.”

4.5 | Simultaneous use of predictive and non-predictive control over the future

We also find that the tension between causation and effectuation becomes visible when an entrepreneur has to employ predictive and non-predictive control over the future simultaneously. The diary excerpt below illustrates this tension at an inter-organizational level, wherein partners with different decision-making approaches have to work together. Thus, when entrepreneurs engage in effectuation favoring control through flexibility and welcoming the unexpected, and a partner organization follows causation, preferring prediction and forecasting, it can be difficult to find common ground:

Episode 5: “Now, we're painting with broad strokes, so to say ... what we can control is our ideas and some small resources. But the potential investors are skeptical, seeing such undetailed planning. They want precise forecasts and calculated predictable numbers. This is a hard and controversial situation to be in.”

In this situation, *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 types of reasoning, and resolve the tension in an efficient way:

Episode 9: “...when writing a business plan, we just have to pretend we know exactly what we're doing, but in reality we don't! This pretending seems to work, it's like camouflage... it may even make you believe in your own idea more (laughs).”

At the same time, the entrepreneurs acknowledged that even though combining opposite decision-making logics could be challenging and cause tensions, limiting yourself to one specific logic could lead to unsuccessful new venture creation:

Episode 21: “Being an entrepreneur can be very hard as often you're required to juggle multiple identities. You have to be a good planner and have things under control, but at the same time you need to be a visionary to foresee various paths that your business might travel. In my opinion, if you can do both you'll succeed, but if you can't you will most likely fail.”

5 | DISCUSSION

Our study demonstrates that decision-making in the process of new venture creation is ambivalent and paradoxical in nature, requiring entrepreneurs to engage in both causal and effectual reasoning, which is consistent with the prior research (Andries et al., 2013; Futterer et al., 2017; Smolka et al., 2018). Going a step further, we focus on how exactly entrepreneurs mix the two logics, and reveal that combining them is not synergistic from the outset, and can cause tensions. We show that entrepreneurs try to overcome these tensions organically through four different mechanisms.

Importantly, tensions between two decision-making logics may occur at different levels—individual, organizational, inter-organizational—or can even cross several levels simultaneously (as shown in Sections 4.1 and 4.3). At the *individual level*, the tension occurs as an inconsistency between gained and newly explored knowledge and experiences. These tensions can have various roots. They can originate from the difference between given knowledge and obtained experiences, and between unexpected emerging information and experiences. In this case, entrepreneurs are forced to tack between and combine causation and effectuation. Additionally, tensions can be caused by the role mismatch felt by entrepreneurs, who have to stay disciplined and engage in routine work, while also engaging in passionate creativity and experimentation. We show that tensions can occur when an entrepreneur tries or is forced to utilize causal and effectual capacity at the same time and in relation to the same task.

At the *organizational level*, causation-effectuation tension results from different entrepreneurial identities and task-related differences that require distinctive decision-making logics in one founding team. While Alsos et al. (2016) find that entrepreneurial identity influences whether an individual engages predominantly in effectual or causal behavior, we go a step further and show how simultaneous engagement in both decision-making logics provokes tensions among founding entrepreneurs. Thus, individuals with a causal identity strive to plan ahead, stick to the plans, and perform tasks that require causal reasoning. Deviations from the plan become a source of anxiety and frustration. Individuals with an effectual identity embrace and utilize uncertainty, thereby profiting from the unexpected; also, they are likely to perform tasks that involve effectual logic. When these causal and effectual functionalities overlap among multiple founding entrepreneurs, tensions tend to appear.

In line with other studies (Appelhoff et al., 2016; Brun, 2016; Frese et al., 2019), we also see that causation-effectuation tensions at the *inter-organizational level* stem from the different operating styles of entrepreneurial start-ups and other actors (e.g., funding bodies, entrepreneurial incubators, accelerators). In this regard, causal operating style relates to structured work, where forecasts are made and business plans established and fixed (e.g., in business incubators). The effectual operating style, in turn, relates to experimenting and improvising in start-up firms that stay open to emerging opportunities.

We identify four tension-resolution mechanisms, (1) juggling with means and various estimated scenarios, (2) beforehand cushioning, (3) reconciling the known and unexpected, and (4) camouflaging, which combine the elements of both decision-making styles in an entangled way. Therefore, unlike in Smolka et al. (2018), where the main assumption is the separation of causal and effectual logics in time or in tasks, and where the exact synergistic interaction remains a “black box,” these four resolution mechanisms represent the true hybrid behaviors where causation and effectuation principles interact inseparably and are balanced in tandem, which leads to successful new venture creation. Grasping this hybridity is important, because it demonstrates what actually happens when the two logics work together. Also, distinguishing between synergy and hybridity is essential. While causation-effectuation hybridity implies interaction, it does not automatically mean they are synergistic; it can cause tensions, and, if they are not resolved, the synergy cannot be established and tensions stay. Even though our data do not go this far, based on the existing research (see e.g., Nummela et al., 2014; Reyman et al., 2015; Yang & Gabrielsson, 2017) we can speculate that in this situation entrepreneurs can switch to one of the logics or separate them. However, according to the definition, this separation is not a synergy but parallel use. Moreover, if the volume of unresolved tension reaches a critical mass, the process of new venture establishment ceases.

Furthermore, because the new venture creation process naturally interrelates different decision-making levels, the causation-effectuation tensions also intersect at several levels; therefore, their resolution consistently has to

involve all these levels. For example, if a firm is able to resolve these tensions in relations with external organizations, but fails to overcome them in internal tasks, the developed new venture may be short-lived. Similarly, if an individual entrepreneur experiences causation-effectuation tensions in relation to their own tasks or decisions, it may lead to poor results no matter how well the tensions are resolved among multiple founding entrepreneurs. Also, if the founding entrepreneurs effectively reconcile given knowledge with leveraging the unexpected, but fail to harmonize goal-setting and acting upon the means at hand, the full synergy will not be attained. Therefore, achieving this synergy and developing a viable and effective business requires the constructive resolution of all possible causation-effectuation tensions at each level, and with regard to each pair of causation-effectuation principles. This way, all four identified mechanisms trigger and reinforce the overall synergy of two decision-making logics.

We also reveal one exception, finding no evidence for any tense relations between causal conducting of market research and effectual reliance on partnerships and networking. Precisely, choosing to simultaneously conduct market research and rely on network relations brings together separate tasks that reinforce each other and consolidate decision-making. Because there are no interactions between these different tasks, we cannot claim there is a synergy between them; however, this separation positively contributes to the venture creation process. This finding remains in line with Chandler et al. (2011), who show that using alliances, networks and pre-commitments is equally present in both strategies and, therefore, does not differentiate effectuation and causation. This finding is also important because it shows that causation-effectuation interplay does not automatically imply tensions between two logics (in the same way as it should not automatically imply their synergy).

Overall, based on the existing literature our study categorizes three modes of interaction between causation and effectuation: separation, hybrid synergy and tensions. Further, in the empirical study we open up the tension mode, examine its resolution mechanisms and show that all three modes can flow one into one another. First, we identify that temporal and/or task *separation* of causation and effectuation implies no interaction and synergy; however, it can contribute to successful new venture creation. Second, *hybrid synergy* is an interaction between causation and effectuation, which is the result of resolved tensions and leads to successful new venture creation. Third, *tensions* suppose causation-effectuation interactions and can lead to the venture failure unless they are resolved through hybrid mechanisms leading to synergy. Our model below (see Figure 2) summarizes this discussion and shows the dynamics of forming causation-effectuation synergy.

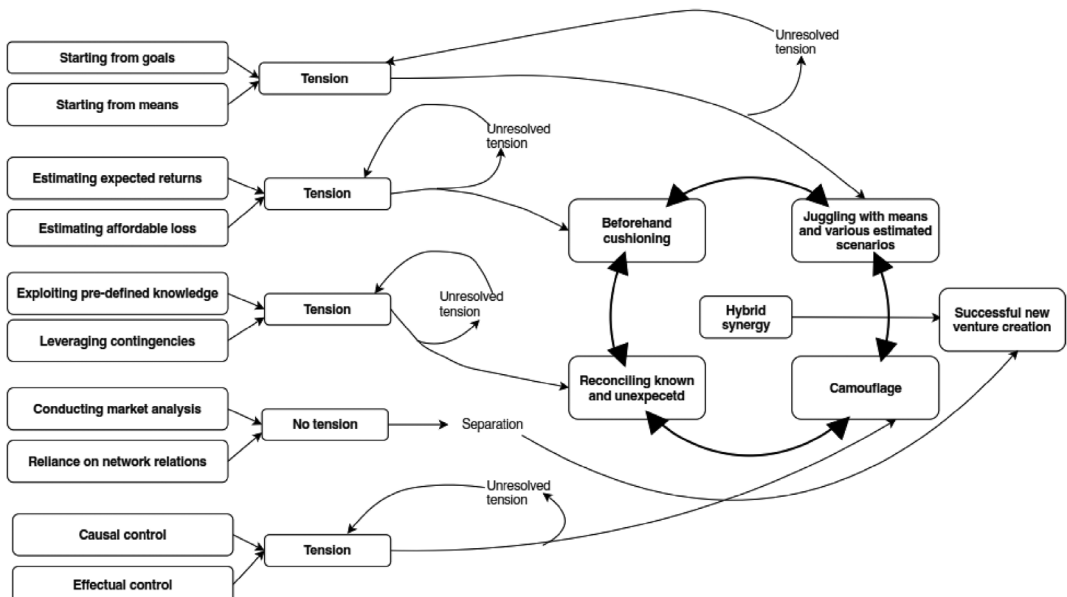


FIGURE 2 From tensions to synergy between causation and effectuation

6 | CONCLUSIONS

6.1 | Theoretical contributions, limitations and directions for future research

First, we contribute to the effectuation research by problematizing the synergistic relationship between causation and effectuation and showing that this synergistic interplay is far more complex than described in the received literature (Perry et al., 2012; Smolka et al., 2018). Specifically, the road to this synergy can be paved with *tensions*, which represent an important but overlooked mode of interaction between causation and effectuation. Further, we identify four mechanisms of resolving these tensions: juggling with means and various estimated scenarios, beforehand cushioning, reconciling the known and unexpected, and camouflaging. Overall, our study pinpoints that it is not enough just to identify that causation and effectuation are (or can be) combined; it is also about *how* they co-exist. In this regard, our categorization of three modes of their interplay—separation (or parallel use), hybrid synergy, and tensions—is instrumental for understanding dynamics of causation-effectuation interplay. While our model focuses on tensions as a starting point, further research can investigate other alternations. For example, whether and under what conditions causation-effectuation synergy can potentially turn into tensions could be examined. Also, our study does not claim that any combination of causal and effectual decision-making necessarily results in tensions from the outset. This is intriguing for future research that could look into mechanisms of causation-effectuation synergy in the absence of tensions. Notably, identifying tensions as one of the modes of co-existence between causation and effectuation offers research opportunities for broader research on entrepreneurial motivation (Murnieks, Klotz, & Shepherd, 2020), emotions (Foo, 2011) and exit decisions (DeTienne & Wennberg, 2016). Our data show that causation-effectuation tensions can cause troublesome feelings, stress, frustration and discomfort. Future studies can examine how these tensions between decision making logics affect entrepreneurs' opportunity evaluation and motivation to continue or exit venturing process.

Second, whereas received research has predominantly focused on one level of causation-effectuation interchange, our study responds to calls to examine the complexity of effectual processes at multiple levels of analysis (Alsos et al., 2019; Smolka et al., 2018). We indicate that causation-effectuation tensions can occur at the individual, organizational and inter-organizational levels; moreover, their resolution mechanisms can span across several levels. These findings could trigger further studies to examine whether, for example, individual-level tension can be resolved at the inter-organizational level (or vice versa), or the levels of the tension and its resolution should necessarily coincide. In addition, even though our research shows how causation-effectuation tensions can be resolved, our data do not enable deeper examination of the skills required to achieve this balance. Hence, future research could examine what ambivalent capabilities and competencies are important to the successful combination of causation and effectuation within an individual, in an organization, and across organizations. This type of research would extend our knowledge on effectual expertise (Read et al., 2016) as combined with causal expertise. Overall, we hope that our findings provide additional possibilities for more multilevel research on entrepreneurial decision making (Shepherd, 2011).

Third, the results of our study can be progressed and suggest interesting implications also for broader entrepreneurship research outside effectuation. Given that “decision units of exploration would contain processes of effectuation, whereas causation models would dominate exploitation” (Sarasvathy, 2001: 254), our study adds to research on the reconciliation of exploitation and exploration for opportunity development (see e.g., Kammerlander, Burger, Fust, & Fueglistaller, 2015; Stettner & Lavie, 2014). Our results can also be used for further research on organizational ambidexterity (Andriopoulos & Lewis, 2009), to understand the ability to manage tensions between exploitative and explorative activities from the decision-making perspective. Also, our study can be helpful in examining the ambivalence of the exploitation-exploration interface from a multi-level approach (Raisch et al., 2009). Furthermore, our article may offer implications for research on venture performance. Future studies can examine how the different effectuation-causation co-existence modes identified in this work affect new venture performance, as earlier

research only investigates the relationship between effectuation and performance (Read, Song, & Smith, 2009), and performance outcomes of the synergetic mode of effectuation and causation (Smolka et al., 2018).

Fourth, our study offers a methodological contribution by adopting the process-based approach and applying the diary method. Thus, this research is a timely response to calls for conducting longitudinal real-time journaling studies to understand how effectuation and causation unfold (McKelvie et al., 2019). While this study focuses on a specific country setting (Finland and Denmark), its results can be applied to other contexts due to the existing consistency in entrepreneurs' cognitive scripts and associated venture creation decisions across countries and cultures (Mitchell et al., 2002; Mitchell, Smith, Seawright, & Morse, 2000). Therefore, we believe that dealing with causation-effectuation tensions during venture creation would be to a large extent similar among entrepreneurs across borders.

6.2 | Practical implications

Our study offers several practical implications for emerging start-ups. It is important to recognize that the process of creating new ventures may be coupled with tensions associated with different decision-making logics. As our study shows, there can be a palette of them. Hence, it is necessary to differentiate between these tensions, as each implies a specific resolution mechanism within a firm. For instance, the use of reconciling known and unexpected mechanisms might not resolve the tension between means-driven and goal-driven principles, and may aggravate the extant tension. An inability to resolve the tensions constructively can potentially lead to the failure or poor performance of a new business. Also, entrepreneurs and other business decision-makers should be aware that the separation of effectuation and causation, their tensions and resolutions through hybrid synergistic mechanisms as modes of interaction are highly inter-related, and one may continuously flow from another. Hence, we suggest developing action scenarios on how causal and effectual activities and tasks can co-occur in new venture creation across different levels. First, the relevant scenarios should identify what causal and effectual practices exist in their firm (whether both are evident and whether one dominates the other). Second, they need to observe the interaction between those (if any), and isolate the reasons why the two co-exist in that particular mode. Third, the entrepreneurs need to recognize whether or not they want to change the mode, depending on the anticipated outcomes. Finally, they should develop various scenarios of change from one mode to another. For instance, a tension mode between causal and effectual tasks can be transformed into their parallel use, where they become separated to avoid contradictions (but this will not mean synergy). If the tension is successfully resolved, synergy can arise between the two logics. Altogether, these change scenarios enable balancing the causal and effectual activities.

Furthermore, our study provides implications also for different stakeholders involved into the venture creation process. We show that causation-effectuation tensions can occur at the inter-organizational level; in practice, this means that decision-making logics and concurrent expectations of start-ups and their counterparts (policy makers, investors, partners, etc.) may not correspond. To balance these tensions and to have congruent expectations, start-ups and other stakeholders need to acknowledge that the key starting points and principles of their decision-making are different due to their different roles in the venturing process. For instance, policy makers and investors need to admit that formal business plans provided by entrepreneurs can be forced rationalizations and aftermaths of otherwise improvisational and non-goal-oriented thinking; hence, these plans may reflect entrepreneurs' reasoning only partially. Therefore, to mitigate these differences and overcome communication ambidexterity, the parties need to embrace a truly cocreational approach towards the new venture creation and openly discuss specific steps of their decision making.

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ENDNOTES

- ¹ We understand synergy as “the *interaction* of elements that when combined produce a total effect that is greater than the interaction or cooperation of two or more organizations, substances, or other agents to produce a combined effect greater than the sum of their separate effects” (Oxford dictionary, 2020; italics added).
- ² We understand tensions as “contradictory demands” (Slawinski & Bansal, 2015: 534) and “as persistent, opposing but interconnected poles, as dualisms rather than dualities, encouraging reframing of paradoxical tensions to accomplish synthesis or transcendence” (Papachroni, Heracleous, & Paroutis, 2016: 1796).
- ³ We follow the strategy of problematization in developing our research questions (Alvesson & Sandberg, 2011). Problematization is an “endeavor to know how and to what extent it might be possible to think differently, instead of what is already known” (Foucault, 1985: 9).

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APPENDIX A: SAMPLE AND DATA COLLECTION

Episode	Stage of business idea development	Business idea	Data collection points (month and year)	Time in the program
Episode 1	Prototyping	Printed electronics	09.2015; 10.2015; 11.2015; 12.2015;	4 months
Episode 2	Business case creation	Software for healthcare	09.2015; 10.2015; 12.2015;	4 months
Episode 3	Business case creation	Software for healthcare	09.2015; 10.2015; 11.2015;	3 months
Episode 4	Ideation; market research	Smartphone application	09.2015; 11.2015; 12.2015;	4 months
Episode 5	Refinement of business plan	Screen technology	09.2015; 10.2015; 11.2015; 12.2015;	4 months
Episode 6	Initial product design	Smartphone application	09.2015; 10.2015; 11.2015; 12.2015;	4 months
Episode 7	Product definition	Energy saving software	09.2015; 10.2015; 12.2015;	4 months
Episode 8	Ideation; product discovery	Digital platform	09.2015; 10.2015; 11.2015;	3 months
Episode 9	Initial product design	Digital platform	09.2015; 11.2015; 12.2015;	4 months
Episode 10	Business case creation	Online marketplace	09.2015; 10.2015; 11.2015; 12.2015;	4 months
Episode 11	Prototyping	Software for games	09.2015; 10.2015; 11.2015; 12.2015;	4 months
Episode 12	Refinement of the prototype	Translation software	09.2015; 10.2015; 11.2015; 12.2015;	4 months
Episode 13	Product definition	Smartphone application	09.2015; 11.2015; 12.2015;	4 months
Episode 14	Product definition; market research	Software for music	09.2015; 10.2015; 11.2015; 12.2015;	4 months
Episode 15	Ideation; product discovery	Software for advertising	09.2015; 10.2015; 11.2015;	3 months
Episode 16	Ideation; product discovery	Digital platform	09.2015; 10.2015; 11.2015;	3 months
Episode 17	Business case creation	Software for bookkeeping	09.2015; 10.2015; 12.2015;	4 months
Episode 18	Defining functionality	Smartphone application	09.2015; 10.2015; 11.2015; 12.2015;	4 months
Episode 19	Ideation; product discovery	Software for advertising	09.2015; 10.2015; 11.2015; 12.2015;	4 months
Episode 20	Defining functionality	Digital platform	09.2015; 10.2015; 11.2015; 12.2015;	4 months
Episode 21	Initial product design	Software for healthcare	01.2017; 02.2017; 04.2017; 05.2017; 06.2017;	6 months

(Continues)

Episode	Stage of business idea development	Business idea	Data collection points (month and year)	Time in the program
Episode 22	Prototyping; defining functionality	Hearing-device application	01.2017; 03.2017; 04.2017; 05.2017; 06.2017;	6 months
Episode 23	Prototype testing; market research	Breath-tracking application	01.2017; 02.2017; 03.2017; 04.2017; 05.2017;	5 months
Episode 24	Product definition	Smartphone application	01.2017; 02.2017; 03.2017; 04.2017; 05.2017; 06.2017;	6 months
Episode 25	Market research; prototyping	Online marketplace	01.2017; 02.2017; 03.2017; 04.2017; 05.2017; 06.2017;	6 months
Episode 26	Product definition	Digital platform	01.2017; 03.2017; 04.2017; 05.2017; 06.2017;	6 months
Episode 27	Initial product design	Software for games	01.2017; 04.2017; 05.2017; 06.2017;	6 months
Episode 28	Refinement of the prototype	Smartphone application	01.2017; 02.2017; 03.2017; 05.2017; 06.2017;	6 months
Episode 29	Refinement of business plan	Software for games	01.2017; 03.2017; 04.2017; 05.2017; 06.2017;	6 months
Episode 30	Defining functionality	Software for healthcare	01.2017; 02.2017; 03.2017; 04.2017;	4 months
Episode 31	Business case creation	Software for healthcare	01.2017; 02.2017; 03.2017; 04.2017;	4 months
Episode 32	Ideation; product discovery	Smartphone application	01.2017; 02.2017; 03.2017; 04.2017; 05.2017; 06.2017;	6 months
Episode 33	Defining functionality	Application for blood tests	01.2017; 02.2017; 03.2017; 04.2017; 06.2017;	6 months
Episode 34	Initial product design	Digital platform	01.2017; 03.2017; 04.2017; 05.2017; 06.2017;	6 months
Episode 35	Defining functionality	Smartphone application	01.2017; 03.2017; 04.2017; 05.2017; 06.2017;	6 months
Episode 36	Market research; prototyping	Smart ring technology	01.2017; 02.2017; 03.2017; 04.2017; 05.2017; 06.2017;	6 months
Episode 37	Prototype testing; marketing plan	Air-system software	01.2017; 02.2017; 03.2017; 04.2017; 05.2017;	5 months
Episode 38	Initial product design	Cell-culture software	01.2017; 02.2017; 05.2017; 06.2017;	6 months
Episode 39	Refinement of business plan	Digital platform	01.2017; 02.2017; 04.2017; 05.2017; 06.2017;	6 months

Episode	Stage of business idea development	Business idea	Data collection points (month and year)	Time in the program
Episode 40	Initial product design	Software for healthcare	01.2017; 02.2017; 03.2017; 04.2017; 05.2017;	5 months
Episode 41	Market research; prototyping	Smartphone application	01.2017; 02.2017; 03.2017; 05.2017; 06.2017;	6 months

APPENDIX B: DIARY QUESTIONS

Week: _____

Venture project stage (beginning/middle/final): _____

Write about your own current thoughts and experiences regarding:

1. What have been the key decisions made since your last diary entry?
2. Who made the decisions?
3. Explain in your words the reasons for these decisions.
4. How have these decisions been implemented?
5. How do you assess the result of these decisions?
6. What are the current tasks carried out (internally/externally) and by whom?
7. What do you think about your business idea/opportunity? Has it changed? How?
8. What are your challenges? Where do you need help?

Thank you for your time!