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The Influence of Generative AI on Entrepreneurial Decision-Making: A Study on Effectuation in SMEs

Master Thesis

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ABSTRACT

Recent literature on effectuation highlights the need for greater investigation into the various antecedents that influence how entrepreneurs deal with uncertainty. Grégoire and Cherchem (2019) called for further research into the aspects that may drive entrepreneurs to use effectual reasoning. In response, this research investigates the ways and degree to which generative AI, specifically, ChatGPT, can assist expert entrepreneurs to make effectual decisions. A qualitative approach was applied, including semi-structured interviews and and the addition of two surveys for a mixed method approach. Even though the initial plan was aimed at novice entrepreneurs, the focus was shifted to expert entrepreneurs to gain deeper, more valid insights into effectual decision-making. The findings reveal that effectual logic was applied most frequently, particularly in the early and scaling phases, with generative AI playing a fascilitating role in opportunity recognition and resource-based improvisation. Depending on the context, entrepreneurs alternated between logics, with causal logic appearing more often in the maturity stage. This suggests that AI can facilitate the hybrid application of causal and effectual logic. Given that generative AI was frequently described by the expert entrepreneurs as an internal resource used to act flexibly in times of uncertainty, this study recommends a revision of the Means Orientation sub-dimensions. Along with "Who I Am," "What I Know," and "Whom I Know," the data supports the addition of a fourth means orientation sub-dimension named "What I Have." This refers to digital means (technologies), such as generative AI, that are now essential to entrepreneurial activity. Incorporating this new dimension would modernise Sarasvathy's original model, better reflecting today's digital entrepreneurial context.

Key words: Generative AI, Chat GPT, Decision-Making, Uncertainty, Effectuation, Causation, Experts

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1. INTRODUCTION

The definition of entrepreneurship, which is a complex and evolving concept, may be understood as the identification and utilisation of opportunities through innovation and strategic risk management. The traditional focus of entrepreneurship remains the creation and management of new ventures (Diandra & Azmy, 2020). However, its definition has evolved over time, containing a broader range of activities and perspectives. Schumpeter and other early economists highlighted the role of entrepreneurs in encouraging market innovation through creative destruction, in which inventive ideas disrupt and replace outdated things (Schumpeter, 1934, as cited in Robra et al., 2023). Today, the concept of entrepreneurship has expanded to include not only the creation of new businesses but also the generation of social and economic value. The challenges that entrepreneurs experience have changed along with entrepreneurship, especially when it comes to dealing with the uncertainty that characterises today's dynamic marketplaces (Ratten, 2023).

Entrepreneurs usually operate in settings where consumer preferences, technological advances, and market conditions change quickly, which makes decision-making more difficult. Due to this uncertainty, entrepreneurs must balance risk and opportunity while making quick adjustments, regularly with limited data (Cowden et al., 2022). A high level of adaptability and flexibility are necessary for successful navigation of such situations, enabling entrepreneurs to change their strategies and make responsible decisions when faced with uncertainty (Kromidha & Bachtiar, 2024). Businesses run the danger of being unprepared for the difficulties they will unavoidably face if they are unable to successfully manage risk and uncertainty (Zellweger & Zenger, 2021).

Two different methods for decision-making are provided by Sarasvathy's (2001) model of causation and effectuation in order to handle the uncertainty that is part of entrepreneurship. In the structured, goal-oriented process of causation, entrepreneurs determine specific objectives and plans of action to reach them (Racat et al., 2023). According to Sarasvathy (2001), this approach is especially useful for novice entrepreneurs because its structured, goal-oriented features allows them to advance with defined steps while reducing complexity, a big benefit when they lack expertice and resources to address uncertainty independently. Effectuation, on the other hand, is a flexible, non-predictive strategy that emphasises making use of the resources at hand and adapting to change when uncertainty arises (Cowden et al., 2022). Sarasvathy (2001) suggests that effectuation is more typically used by expert entrepreneurs that can leverage their skills, networks, and resources to respond flexibly to uncertainty and make use of emerging possibilities. However, Smolka et al. (2018) argue that effectuation may also provide beneficial adaptability for novice entrepreneurs confronted with uncertain situations, allowing for flexibility across experience levels.

Novice entrepreneurs are a perfect fit for this study as they often experienced greater difficulties in handling uncertainty because of their inexperience and lack of resources. Additionally, this group is more accessible and offers insightful information on how effectuation might be the most effective framework for dealing with uncertainty (Dew et al., 2009). Effectuation provides a more adaptable and flexible method, which makes it particularly relevant to understanding how novice entrepreneurs make choices in uncertain cases. In order to get a better understanding of how novice entrepreneurs make decisions in uncertain situations, it is important to examine the underlying factors that shape this decision-making process. It is essential to further investigate these antecedents, which have been insufficiently examined to date (Grégoire & Cherchem, 2019). This gap in the literature acts as the foundation for this study, which aims to gain a better understanding of the variables that influence the use of effectuation in situations of uncertainty.

Sarasvathy (2001) highlighted expertise gained through experience as an important antecedent to effectuation, but later research has raised questions on additional antecedents that could influence the use of effectuation in case of uncertainty.

1.1 RESEARCH GAP

Building on Sarasvathy's (2001) fundamental model, Smolka et al. (2018) perceived the need for further research into possible variables other than entrepreneurial expertise that could influence the usage of effectuation. They suggest that there is still much to be discovered in this field, and that there are many factors that remain to be empirically validated, highlighting the richness of the unexplored areas in this domain.

Grégoire and Cherchem's (2019) extensive structured literature review confirms this gap, emphasising that while significant research has focused on defining what effectuation is and the way entrepreneurs apply it in uncertain environments, there has been insufficient attention paid to the variables that lead individuals to adopt this logic. The outcomes of research on the antecedents of effectuation is inconsistent; some studies indicate that expert entrepreneurs are more likely to apply effectual thinking, while others suggest that even novice entrepreneurs and students practice effectual behaviours. The inconsistency is primarily due to the varying theoretical frameworks adopted throughout research, such as expertise, social identity, and learning theories, which complicate the establishment of a solid understanding about the antecedents of effectuation (Smolka et al., 2018; Grégoire & Cherchem, 2019). In accordance with Sarasvathy's (2001) theory of effectuation, entrepreneurs continually adjust their decision-making by considering the changing resources at their disposal, utilising new tools and opportunities as they emerge in unpredictable situations.

As markets become increasingly dynamic and information more readily available, the tools used by entrepreneurs to deal with this complexity have also evolved. This is where new technologies, especially artificial intelligence (AI), come into play. ChatGPT and other generative AI tools have moved from being futuristic concepts to being really useful tools that are changing the way businesses and individuals make decisions.

In particular, entrepreneurs are utilising generative AI to address the rapid changes and incomplete data that are often characteristic of uncertainty, thereby facilitating the optimisation of decision-making processes and the identification of new opportunities (Ge et al., 2022; Weiser & von Krogh, 2023; Usman et al., 2024). This is consistent with effectuation's determination to leverage available resources and responding to change. The question therefore arises: could generative AI, such as ChatGPT, act as an antecedent to effectuation logic? While this has yet to be completely investigated, AI's rising importance in managing uncertainty implies that it may impact entrepreneurial behaviour by encouraging flexibility and adaptation (Giuggioli & Pellegrini, 2022). Further exploration of this connection could reveal how generative AI might shape effective behaviours, particularly in uncertain environments.

1.2 RESEARCH QUESTION

"To what extend can generative AI, such as ChatGPT, act as an antecedent variable for effectuation in uncertain entrepreneurial environments?"

The present study contributes to the expanding body of literature on entrepreneurial decision-making by providing a better understanding of the antecedents of effectuation in the setting of novice entrepreneurs. By looking at how generative AI, like ChatGPT, can influence effectuation, this research helps us understand how new technologies are changing the way we deal with uncertainty. This study will not only contribute to filling a gap in existing research on how novice entrepreneurs use effectuation, but it also adds to Sarasvathy's (2001) model by looking at how AI might affect entrepreneurial decision-making in uncertainty. Furthermore, this study gives practical insights into how novice entrepreneurs with limited resources and expertise may better use AI to increase their flexibility and decision-making in uncertain situations. The findings have the potential to contribute significantly to the development of entrepreneurship education, the formulation of start-up strategies, and the creation of AI tools designed to assist entrepreneurs in navigating uncertain circumstances.

The exploratory nature of this study is well

suited to a qualitative approach, which is ideal for exploring a relatively new and under-researched phenomenon. The goal is to discover new insights and find themes and patterns that have not before been investigated. Unlike quantitative research, which is all about testing predefined hypotheses and measuring pre-known variables, qualitative research allows us to discover unexpected insights and understand complex interactions, which is really important for a topic like the influence of AI on effectuation.

2. THEORY

Causation is an approach to decision-making defined as a well-organised, goal-oriented method in which entrepreneurs define specific objectives and develop strategies for achieving them. Causation is based on prediction techniques that aim to achieve predetermined goals with the help of systematic planning as well as analysis (Sarasvathy, 2001). It is especially beneficial in stable circumstances where expected outcomes may be pursued with more confidence. For example, entrepreneurs applying causation would start with a clear vision for their enterprise, carry out thorough market research, and develop a step-by-step strategy for achieving these goals while allocating resources correctly (Dew et al., 2009; Sarasvathy, 2001).

Effectuation, opposite to causation, represents the adaptive, non-predictive method that emphasises flexibility and utilisation of available means, such as human resources, expertise, and social networks. Entrepreneurs applying effectuation leverage their currently available resources in their response to changing conditions rather than sticking to precise plans or long-term goals (Sarasvathy, 2001; Read et al., 2009). This method enables entrepreneurs to handle unexpected situations by focussing on the things they can control and utilising principles that encourage creativity and flexibility. Entrepreneurs applying effectuation, would focus on leveraging their available assets and connections, constantly adapting their strategy as they learn from the circumstances (Fisher, 2012; Wiltbank et al., 2009).

2.1 DECOMPOSITION OF DIMENSIONS

In accordance with Sarasvathy's (2001) theory, effectuation and causation can be classified into five dimensions, which are explored in greater depth below. Firstly, a table of all five principles is presented, followed by an in-depth explanation of each.

Effectuation Dimensions	Description	Causation Dimensions	Description
Means Orientation *(Bird in Hand)*	Decisions based on existing resources and skills (*Who I am, What I know, Whom I know*)	**Goal Orientation**	Decisions focused on pre-established, specific goals.
Affordable Loss	Risk-taking is limited to what the entrepreneur can afford to lose.	**Expected Returns**	Investments made with an expectation of specific financial returns.
Leveraging Contingencies *(Lemonade)*	Embraces surprises as opportunities and adapts plans accordingly.	**Avoiding Surprises**	Prefers stable conditions with minimal changes and surprises.
Strategic Partnerships *(Crazy Quilt)*	Builds partnerships with interested stakeholders to co-create the venture.	**Competitive Analysis**	Focuses on competition to gain advantage and reduce external dependencies.
Control Orientation *(Pilot in the Plane)*	Focuses on controlling the controllable aspects rather than predicting the future.	**Prediction Orientation**	Emphasizes forecasting future trends and preparing accordingly.

Table 1: The five principles of effectuation and causation (Sarasvathy,2001).

1. Means Orientation vs. Goal Orientation

Means Orientation (Bird in Hand) - Effectuation

The Means Orientation principle emphasises that entrepreneurs prioritise the utilisation of their existing resources, including skills, expertise and networks, over the adherence to pre-defined, distant objectives. Sarasvathy (2001) states that this method encourages entrepreneurs to start off by asking themselves "Who am I?" What do I know? "Whom do I know?", assisting them in identifying and successfully leveraging their immediate resources. By focussing on the resources that are available, entrepreneurs could generate value incrementally rather than relying on strict plans or predictions (Dew et al., 2009).

Goal Orientation - Causation

Unlike a flexible and adaptive approach, Goal Orientation relies on detailed planning and forecasting by developing clear, predefined, measurable goals from the start. This proactive approach, as stated by Sarasvathy (2008), is particularly suitable for novice entrepreneurs as it offers a structured way of reducing uncertainty and draw a detailed plan of action. Entrepreneurs applying this principle make a plan to reduce potential obstacles by recognising potential risks ahead of time and proactively allocating resources (Dew et al., 2009).

2. Affordable Loss vs. Expected Returns

Affordable Loss - Effectuation

The Affordable Loss approach emphasises risk minimisation by investing just what the entrepreneur is ready and able to lose, avoiding putting the larger goals at risk. Sarasvathy (2001) states that this strategy is especially important in uncertain markets, where standard ROI forecasts are less reliable. Entrepreneurs create the groundwork for iterative learning by allocating limited resources to early experimental businesses. This strategy allows for flexibility in pivoting based on feedback while limiting risk, therefore encouraging innovation with reasonable financial exposure (Sarasvathy 2001; Read et al., 2011).

Expected Returns - Causation

The Expected Returns principle of causation focusses on maximising ROI with calculated risks, in which entrepreneurs invest based on predicted financial returns instead of cautious testing with minimum exposure (Sarasvathy, 2008). This method is especially useful in stable markets, as it encourages structured financial planning with predictable results and appeals to stakeholders who value stability (Chandler et al., 2011). However, its dependence on thorough forecasting may limit adaptability, providing challenges in uncertain or fast changing contexts.

3. Leveraging Contingencies vs. Avoiding Surprises

Leveraging Contingencies (Lemonade) - Effectuation

The Lemonade Principle, which comes from the saying, "When life gives you lemons, make lemonade," reflects an entrepreneur's ability to look at unexpected events as chances for growth rather than obstacles. Sarasvathy (2008) uses this concept in her effectuation model to show that entrepreneurs could see unexpected problems as good opportunities to innovate and adapt. Instead of perceiving surprises as setbacks, they turn them into opportunities for growth, encouraging adaptability and resourcefulness (Dew et al., 2009).

Causation: Avoiding Surprises - Causation

Unlike the Lemonade approach, which translates unexpected happenings into opportunities, the Avoiding Surprises approach prioritises careful planning and risk management to avoid unexpected obstacles (Sarasvathy, 2008). This method emphasises predictability, with the goal of identifying and preventing any potential risks ahead of time. Such planning assists entrepreneurs in achieving stability, particularly in highly regulated industries where consistency and compliance are critical. While this organised approach provides security, it might hinder flexibility and the capacity to adapt swiftly to unforeseen changes (Dew et al., 2009).

4. Strategic Partnerships vs. Competitive Analysis

Strategic Partnerships (Crazy Quilt) - Effectuation

This principle, called Crazy Quilt, emphasises the importance of creating partnerships with varying stakeholders to enable resource pooling and risk-sharing. According to Sarasvathy (2001), entrepreneurs can broaden their capabilities through partnerships, which help to strengthen resilience and provide access to a wide range of expertise. Strategic partnerships, which are especially important in limited resources contexts, assist entrepreneurs in growing their businesses by using collective skills rather than individual efforts (Fisher, 2012).

Competitive Analysis - Causation

The Competitive Analysis dimension is all about outperforming rivals. It is about understanding their strategies and market positions. This is in contrast to the Strategic Partnerships dimension, which emphasises collaboration and resource sharing (Sarasvathy 2001). Entrepreneurs who use this approach focus on studying their competitors to identify gaps in the market and make their own offerings better. This approach is all about gaining the upper hand through in-depth analysis and strategic positioning. It is particularly effective in stable industries where consistent data makes it easier to plan ahead (Read et al., 2009).

5. Control Orientation vs. Prediction Orientation

Control Orientation (Pilot in the Plane) - Effectuation

The Control Orientation principle, also called the Pilot in the Plane principle, emphasises shaping outcomes through factors directly under an entrepreneur's control, rather than depending on predictions.

Sarasvathy (2001) emphasises that this proactive strategy enables entrepreneurs to overcome uncertainty by forming plans based on existing resources and conditions, minimising reliance on projections and increasing resilience (Dew et al. 2009; Wiltbank et al. 2009). Entrepreneurs make this happen by focusing on what they can do right now and changing their plans when new controllable factors appear, which helps them stay flexible in situations where things are unclear.

Prediction Orientation - Causation

In contrast to control orientation, which places emphasis on shaping desired outcomes through controllable factors, prediction orientation uses forecasting to shape decisions. This dimension uses historical data and trend analysis to forecast market demand, assisting entrepreneurs in reducing uncertainty through structured, data-driven approaches (Sarasvathy, 2001; Dew et al., 2009). It promotes systematic allocation of resources and planning in stable situations, but it can reduce flexibility in rapidly evolving markets.

2.2 AI

Generative AI is a groundbreaking division of artificial intelligence that allows machines to generate new content autonomously, such as text, pictures, and audio, by learning from large datasets and imitating human-like language patterns. ChatGPT, one of the most widely utilised generative AI applications, is at the forefront of this breakthrough. ChatGPT, developed by OpenAI, is an interacting digital assistant in an easily accessible, chat-based style which enables real-time interactions for a variety of activities, including email writing, summarising texts, and coding assistance. Such versatility provides value to users of all backgrounds (Welsby & Cheung, 2023; Ventura & De Menezes Filho, 2023)

ChatGPT is driven by an intelligent system designed to interpret and fully understand human language. It creates replies by finding patterns in a variety of digital sources such as books, papers, and webpages. ChatGPT, rather than "knowing" answers, gathers information from different sources to deliver responses suited to specific requests (Cui, 2023) Its ability to provide natural, context-aware responses makes it a useful tool for anybody in need of information or assistance, for example entrepreneurs looking for immediate information or assistance (Sharma et al., 2023).

Additionally, ChatGPT's broad abilities may be especially useful for entrepreneurs that are still developing their business or entering new markets. Entrepreneurs in such cases may benefit from ChatGPT's extensive access to information, including industry insights, competition strategies, and market trends that may help with early-stage decision-making (Tran & Murphy, 2023; Short & Short, 2023).

While offering this degree of information and guidance, ChatGPT assists in levelling the playing field by allowing entrepreneurs to address market difficulties with greater confidence and understanding, so improving their capacity to compete effectively (Mahmudin, 2023).

ChatGPT is great for more than just traditional tasks. Beyond the standard usage, ChatGPT's position as a digital resource can be a great help to entrepreneurs dealing with uncertainty. As it can process large amounts of data fast, ChatGPT functions as a dynamic tool, providing personalised advice and potential strategies quickly (Jusman et al., 2023). ChatGPT can serve as a digitised personal advisor to entrepreneurs dealing with uncertain circumstances.

It helps entrepreneurs make well-informed decisions in a variety of scenarios by offering actionable insights and letting them quickly evaluate possibilities (Zhou & Cen, 2024). Such a capable tool enables entrepreneurs to anticipate issues before they completely become reality, making it easier to deal with uncertainty proactively.

On the other hand, despite its benefits, ChatGPT has limits along with potential risks. It can occasionally generate inaccurate or biased information because its responses are built on datasets that can have some biases or outdated standpoints (Ray, 2023). Security of data and privacy are other issues, as applying AI tools in critical corporate decision-making could expose confidential data. Therefore ChatGPT should be approached carefully by double-checking important outcomes and using personal judgement to reduce risks. By following these safety measures, entrepreneurs can benefit from the many advantages of ChatGPT while minimising the risks (Zhou et al., 2023).

2.3 LINKAGES BETWEEN CHATGPT AND SARASVATHY'S THEORY

The theory of effectuation and causation by Sarasvathy (2001) has grown to be an influential framework in entrepreneurial studies, distinguishing two key approaches of decision-making in times of uncertainty. This important model identifies five essential dimensions for each method, distinguishing between the responsive and resource-based approach of effectuation and the goal-oriented, predictive approach of causation. However, over time, scholars (Brettel et al., 2012; Chandler et al., 2011) have questioned the relevance as well as the applicability of particular dimensions in various entrepreneurial situations. These critiques have led to a reconsideration of her original dimensions, with scholars suggesting different interpretations and adjustments to strengthen and adapt the theory to modern, dynamic business circumstances (Arend et al., 2015; Wiltbank et al., 2009).

Brettel et al. (2012) suggest a shorter version of Sarasvathy's (2001) framework, with four dimensions in each approach. They examine Sarasvathy's (2001) five-dimensional model for effectuation and causation, suggesting that some of the dimensions do not apply widely across different types of entrepreneurship. They mainly question the 'Avoiding Surprises' and 'Strategic Partnerships' dimensions. Brettel et al. (2012) believe that 'Avoiding Surprises', which is all about avoiding risks you did not see coming, might limit how flexible an entrepreneur can be in fast-changing markets.

They believe that focusing too much on avoiding unexpected events can make it harder for entrepreneurs to respond to new opportunities that often take place in unpredictable environments. Likewise, they say that while "Strategic Partnerships" can be good for sharing resources, they might not be useful for all entrepreneurs. Partnerships can bring limits on independence and might make it harder to control things in competitive fields.

So, Brettel et al. (2012) suggest a simpler four-dimensional model, leaving out these two dimensions to better reflect the flexible and adaptable approaches that are important for entrepreneurs in different situations. An assessments of Sarasvathy's model has also been done by Arend et al. (2015), particularly of the 'Means Orientation' aspect of effectuation.

They believe that limiting entrepreneurs to only what they have at their current disposal stops them from seeking out additional resources that could increase their chances of success (Arend et al., 2015). This method, they argue, does not represent the adaptability frequently required in real-world entrepreneurship, whereas getting more resources before reacting is common and sometimes critical (Arend et al., 2015). Furthermore, Arend et al. wonder if entrepreneurial behaviours can ever be completely goal-free, meaning that also "effectual" actions are frequently automatically goal-driven. They argue that Goal Orientation under causation better represents real entrepreneurship because it allows for a combination of resource utilisation and goal-setting, which frequently cross and reinforce one other (Arend et al.,2015).

In this study, we carefully considered the critiques on Sarasvathy's five-dimensional model given by Brettel et al. (2012) and Arendt et al. (2015), recognising the value of their viewpoints in improving our approach. Brettel et al. (2012) believe that aspects such as "Avoiding Surprises" and "Strategic Partnerships" may hinder flexibility and adaptability since these methods frequently emphasise risk aversion and reliance on partnerships, this may not be appropriate for all entrepreneurial situations. Following that, Arendt et al. (2015) criticise the "Means Orientation" dimension for its strict focus on current resources, which might prevent entrepreneurs from seeking extra or external resources required

The Affordable Loss dimension invites entrepreneurs to centre low-risk investments, investing just what they are ready to lose (Sarasvathy, 2001). ChatGPT's utility here could be limited since it lacks the ability to give exact, context-specific assessments of risk or financial predictions that would assist entrepreneurs in accurately estimating acceptable losses. While it may simulate basic scenarios using historical data, it cannot account for the changing market conditions that influence risk-aware decision-making, limiting its usefulness in this field (Lakkaraju et al., 2023). On the other hand, the Expected Returns dimension in causation focusses on maximising return on investment by structured financial forecasting. ChatGPT's dependence on historical data as well as qualitative information lacks the ability of accurate quantitative forecasting necessary for this approach, thereby limiting its applicability in this context (Neilson, 2023).

Control Orientation is all about shaping outcomes through elements directly under an entrepreneur's control (Sarasvathy 2001). ChatGPT's accuracy is limited by its dependence on pre-existing data and its lack of real-time updates, providing obstacles for a Control Orientation approach (Li et al., 2023). This reliance on historical data and external input restricts its capacity to give the proactive, self-directed direction this dimension requires, making it less suitable for assisting entrepreneurs who must take direct control over their company outcomes (Biswas, 2023).

Competitive Analysis prioritises understanding competitor's strategy and market positioning, which requires a solid understanding of the dynamics of the market (Sarasvathy, 2001). ChatGPT, which is trained on generalised historical data, is incapable of providing accurate up-to- date competitive insights, which makes it an unsuitable choice for entrepreneurs needing real-time, detailed competitor analysis (Hassani & Silva, 2023).

2.4 CHOSEN DIMENSIONS AND PROPOSITIONS

When selecting which dimensions from Sarasvathy's (2001) model could benefit the most from integrating with ChatGPT, we prioritise the ones where ChatGPT's abilities in processing information, pattern recognition, and scalable assistance are valuable for entrepreneurs making decisions in uncertainty. The dimensions selected below are dimensions whereby I believe ChatGPT could provide clear utility.

Goal orientation is an important aspect of causation. This dimension is all about setting clear goals and putting together a strategy to achieve them (Sarasvathy, 2001). ChatGPT can help entrepreneurs by assisting them in the formulation of realistic, measurable goals based on the (contextual) input given by the entrepreneur (Cui, 2023). Thanks to its access to loads of digital sources, ChatGPT can help entrepreneurs create strategies that are in line with their goals by offering insights and suggestions based on accessible market knowledge and the entrepreneur's input. This enables ChatGPT to help entrepreneurs refine their goals with data-driven advice (Chuma & De Oliveira, 2023. Additionally, ChatGPT's ability in simulating "what-if" scenarios and give benchmarking insights based on historical market data can help entrepreneurs identify shortcomings and opportunities in their approach. However, while ChatGPT can help with setting goals and forming strategies, it still relies on what the user's input, which shows that it needs someone to keep an eye on it to make sure it is in line with what the entrepreneur's specific objectives (Arman & Lamiya, 2023b).

Leveraging Contingencies, also referred to as the "Lemonade Principle," encourages businesses to adapt to unexpected circumstances and transform them into beneficial opportunities (Sarasvathy, 2001). ChatGPT may help significantly in this regard by serving as a personal advisor, providing advice adapted to the entrepreneur's inputs on the unexpected scenarios. ChatGPT, in specific, analyses trends in historical data, comparable circumstances, and relevant market settings to assist entrepreneurs in developing potential solutions that can be in line with industry best practices (Cui, 2023; Azaria et al., 2023). ChatGPT assists entrepreneurs in the exploration of flexible directions and alternative approaches by suggesting contingency strategies.

This fosters an adaptive attitude. For example, if an entrepreneur experiences unexpected changes in customer behaviour, ChatGPT can make recommendations for shifting product focus based on comparable market changes identified in its training data (Chuma & De Oliveira, 2023; Ausat et al., 2023).

Prediction Orientation is a good fit for ChatGPT since it is based on predicting future patterns using structured and data-driven approaches (Sarasvathy, 2001). Entrepreneurs can greatly benefit from its capacity to evaluate historical data and offer insights based on patterns in order to predict future events (Alzyoud, 2023). For example, based on historical patterns, ChatGPT can produce structured answers to hypothetical "what-if" scenarios, allowing business owners to be ready for a variety of potential outcomes (Chuma & De Oliveira, 2023).

By offering well-founded, data-driven guidance, this proactive strategy facilitates better decision-making while allowing for human interpretation and adjustment to changes in real time (Zhang, 2023). ChatGPT's role is best seen as an adaptive tool that allows for flexible decision-making while emphasising the significance of human judgement in successfully contextualising its suggestions (Chuma & De Oliveira, 2023).

Propositions:

Effectuation and causation are two different and mutually exclusive methods of entrepreneurial decision-making, as defined by Sarasvathy's (2001) theory. According to researchers like Smolka et al. (2018) as well as Reymen et al. (2015), entrepreneurs frequently apply a combination of the two approaches rather than one or the other. However, treating both approaches as separate frameworks has significant benefits for this study. The separation of these two frameworks enables a more isolated and focused examination, reducing confusion caused by overlapping elements and avoiding unnecessary complexities (Zhou & He, 2023). Adopting this approach can help minimise the risks to the validity of the examination of both methods and increase the reliability of it (Shadish et al., 2001). This approach allows both approaches to be examined separately from each other and with depth to properly compare the outcomes of both isolated methods. This makes it easier to capture the differences, therefore a separative approach was chosen.

1a - Goal Orientation: Novice entrepreneurs who use ChatGPT for causal decision making will experience increased clarity and structure in setting and reaching goals.

1b - Goal Orientation: Effectuation driven entrepreneurs show less reliance on the usage of ChatGPT.

2a - Lemonade Principle: ChatGPT's advisory role will enable entrepreneurs who focus on effectual decision making to adapt more effectively to unexpected events and opportunities.

2b - Lemonade Principle: Entrepreneurs adopting causal decision making will show limited adaptability to unexpected changes when relying on ChatGPT, as its guidance is more closely aligned with structured approaches.

3a - Prediction Orientation: Entrepreneurs who are driven by causation can benefit from ChatGPT's predictive abilities, which help them make data-driven forecasts

3b - Prediction Orientation: Entrepreneurs who are driven by effectuation avoid ChatGPT for forecasting purposes, preferring flexibility over prediction.

3. METHODOLOGY

This chapter offers an outline of how the study was ultimately carried out. It describes the sample type, methodologies employed, and how the acquired data was analysed. It also outlines key modifications made to the initial intended research approach along the way, as well as the justification behind those changes. Step by step, the chapter takes the reader through the original plan, the points at which the study direction was changed, and how the approach evolved into its finalised form.

3.1 INITIAL RESEARCH DESIGN AND FRAMEWORK

The initial goal of this research was to determine to what extend generative AI platforms, such as ChatGPT, might act as an antecedent variable in the decision-making approach of novice entrepreneurs operating in uncertain circumstances. This direction was based on a well-documented literature gap pointed out by Grégoire and Cherchem (2019), who highlighted that while extensive research has been carried out on how entrepreneurs use effectuation, very little attention has been paid to the antecedents that lead to the adoption of this logic. Smolka et al. (2018) emphasised the need for more study into variables other than entrepreneurial expertise that may impact the application of effectuation.

Given the growing importance of generative AI tools in shaping entrepreneurial behaviour, notably in managing uncertainty and supporting decision-making (Ge et al., 2022; Usman et al., 2024), it was decided to examine generative AI as a possible antecedent to effectual logic. The study initially focused on novice entrepreneurs because of their increased vulnerability to uncertainty (due to a lack of expertise and resources) and their availability for empirical research. Prior research suggests that novice entrepreneurs, not only expert entrepreneurs, may benefit from effectual principles (Dew et al., 2009; Smolka et al., 2018).

Based on Sarasvathy's (2001) model, a specific set of three dimensions was selected for further investigation:

- **Goal Orientation** (Causal): Selected as it demonstrates the plan-driven attitude typical among novice entrepreneurs. It involves setting clear objectives while creating plans of action to meet them (Sarasvathy, 2008), which matches with the support tools like ChatGPT can provide particularly in goal formulation and structured planning.
- **Leveraging Contingencies** (Effectual): This dimension shows the ability of an entrepreneur to approach unexpected circumstances as opportunities rather than as a threat (Dew et al., 2009). Given generative artificial intelligence's ability to work as a real-time problem-solving tool, aiding businesses in responding adaptively to surprises (Chuma & De Oliveira, 2023) it was considered very relevant.
- **Prediction Orientation** (Causal): This feature was included to explore whether generative artificial intelligence could assist business owners predict future events or trend direction. It was expected that ChatGPT may provide a predictive logic (Zhang, 2023) as it analyses previous patterns and big datasets to reproduce predicted outcomes. This corresponds with the concept of causal forecasting, in which business owners attempt to minimise uncertainty by organising their activities around data-driven forecasts (Sarasvathy, 2001).

The theoretical framework excluded and critically assessed two dimensions.

- **Means Orientation** (Effectuation): This dimension, which promotes action based on existing resources, was rejected due to concerns that it would limit growth-minded thinking. According to Arend et al. (2015), focussing entirely on current resources may discourage entrepreneurs from exploring external possibilities or strategic development, which is especially important for novice entrepreneurs who could benefit from employing AI to reach beyond their current resources.
- **Avoiding Surprises** (Causation): This dimension was previously eliminated because its emphasis on preventing unexpected events might limit entrepreneurial flexibility. As Brettel et al. (2012) explain, focussing too much on avoiding surprises might hinder one's ability to adapt and react to new opportunities, especially in fast-changing environments in which such opportunities often come unexpectedly.

Chapter 2.4 presents the initial propositions that were formulated in line with these chosen dimensions.

3.2 ADJUSTMENT IN RESEARCH DIRECTION

A critical evaluation of the study's initial research direction was carried out after the research strategy was initially formulated. A deeper review of the research gap noted by Grégoire and Cherchem (2019), which continues to serve as the study's key paper, served as the main motivation for this re-evaluation. Their detailed analysis of the literature on effectuation showed that previous studies have already carefully examined the theoretical underpinnings of effectuation. Future research, they said, must concentrate on identifying the antecedents that influence entrepreneurs to apply effectual decision-making logic in uncertain situations.

This recognition assisted in understanding and sharpening the study's actual goal, which was to investigate potential antecedents for entrepreneurs' application of effectual decision-making rather than revisit or expand the theory. This shift in focus made it clear that entrepreneurs, who are most likely to apply effectual logic, must make up the study's sample. Research on the antecedent variables of effectuation would be of limited value if they were studied in a population where effectuation is not likely to be present.

In her original work, Sarasvathy (2001) states that expert entrepreneurs are the primary group who naturally apply effectuation. According to her, expert entrepreneurs tend to embrace uncertainty, work with the resources available to them and adapt to change as they take place, all of which are foundational traits of effectuation. Although later studies (e.g. Smolka et al., 2018) have indicated that novice entrepreneurs may show effectual behaviour as well under uncertain circumstances, Sarasvathy's initial stance remains the dominant theoretical perspective. For this reason, the decision was made to realign the direction of the study and shift the focus from novices to experts. This change ensures that the research remains closely aligned with the foundational logic of the theory upon which it is based.

If the sample consisted exclusively of novice entrepreneurs, there would have been a real chance that effectual thinking might not have been observed at all, limiting the possibility of studying its antecedents. To prevent this risk from occurring, the study focusses on a group with a high theoretical chance of showing effectual orientation, which improves the study's validity.

In order to define the definition of an expert entrepreneur, the study follows the widely accepted definition established by Mitchell et al. (1996). Their framework defines expert entrepreneurs as individuals who have either two or more years of entrepreneurial experience or who have founded at least three ventures, with at least one of these currently active and profitable. This clearly defined, measurable definition enabled the selection of a sample that aligns with the study's theoretical basis and research objectives.

However, entrepreneurship has seen new opportunities and challenges emerge with the rise of generative AI, particularly with the emergence of platforms such as ChatGPT. These technologies are evolving rapidly and are being adopted in various industries for tasks such as ideation, planning, customer interaction, and identifying opportunities (Ge et al., 2022; Usman et al., 2024). The way in which entrepreneurs approach uncertainty and make strategic decisions is set to be impacted by generative AI, a groundbreaking technological development. Due to its extensive use and growing importance, generative AI emerged as a promising variable to investigate as a potential antecedent of effectual behaviour.

As a result, the primary research question was refined to more accurately reflect these insights: "***To what extent can generative AI serve as an antecedent variable for effectuation in the decision-making of expert entrepreneurs?"*** Full alignment with the original literature gap presented by Grégoire and Cherchem (2019) is maintained by this revised approach, while the practical relevance of the study is strengthened at the same time. The study's chances of providing important and generalisable findings are increased by focussing on expert entrepreneurs in whom effectuation is theoretically predicted, as well as by investigating the potential role of a technology with real-world advancement.

There is no deviation from the core intention of the study in this strategic realignment. Instead, it ensures that the exploration of the antecedents of effectuation is conducted under the most suitable research conditions. Then, in the next paragraph, the Sarasvathy (2001) dimensions that were used to structure this research are presented, which are then followed by a paragraph with the revised propositions.

3.3 SELECTION AND JUSTIFICATION OF SHIFT IN SARASVATHY'S DIMENSIONS

Re-evaluation of the relevant dimensions from Sarasvathy's (2001) framework was required given the change in study focus from novice to expert entrepreneurs. With implementation of these different principles depending on the degree of expertise of the entrepreneur, the inclusion of dimensions that literature consistently associates with this sample became important.

In comparison to novice entrepreneurs, who usually have limited resources and experience, expert entrepreneurs will more likely adopt effectual principles such as leveraging contingencies and operating by using the means available to them (Dew et al., 2009; Sarasvathy, 2001). As a result, the final model used in this study consists of four dimensions: two representing effectual reasoning (Means Orientation and Leveraging Contingencies), and two representing causal reasoning (Goal Orientation and Avoiding Surprises), which enables cross-comparison.

Means Orientation (Effectuation): Decision-making based on available resources, networks and capabilities is central to effectual logic and is described by Means Orientation. This dimension was initially excluded due to concerns that it might limit the exploration of external opportunities (Arend et al., 2015). However, it was reintegrated into the model following the transition to expert entrepreneurs. Due to their possession of resources, obtained experience, and broader networks, expert entrepreneurs are better equipped to make use of the resources already available (Sarasvathy, 2001). It was further highlighted by Dew et al. (2009) that feasible opportunities are often created by expert entrepreneurs from the elements of who they are, what they know, and whom they know. Including this dimension, therefore, enhances alignment with the real-world behaviour of experienced entrepreneurs.

Goal Orientation (Causation) Goal orientation is the planning-driven strategy in which certain goals are set and methodically worked towards. Because of its importance in cross-examining the existence of causal logic, this dimension was kept in the research. Even among expert entrepreneurs, goal-orientated behaviour can still occur, especially when entrepreneurs operate in predictable environments (Read et al., 2009). Additionally, through the incorporation of Goal Orientation, it is possible to explore how AI tools might facilitate structured planning in even more effectual settings, providing insights into hybrid approaches to decision-making (Reymen et al., 2015).

Leveraging Contingencies (Effectuation) The ability to turn unexpected events into entrepreneurial opportunities is captured by the dimension of leveraging contingencies (effectuation). This is an example of expert entrepreneurial behaviour, particularly in dynamic markets (Dew et al., 2009). Sarasvathy (2008) described this principle as 'learning by doing', emphasising the importance of flexibility and responsiveness for long-term adaptability. Expert entrepreneurs are more likely to take advantage of opportunities that arise from uncertainty because they are more comfortable with uncertainty and have developed their own strategies for dealing with it (Fisher, 2012). Furthermore, the constantly changing nature of generative AI itself brings uncertainty, which makes this dimension especially relevant when assessing how entrepreneurs react to the introduction of such disruptive technology.

Avoiding Surprises (Causation) This dimension was initially excluded. This was based on concerns that it could limit adaptability in uncertain circumstances (Brettel et al., 2012). It was later reintroduced as a necessary causal opposition to the effectual Leveraging Contingencies dimension. While surprises are avoided by a more risk-averse, predictive logic, relevance is still maintained for expert entrepreneurs, who may adopt preventive strategies to protect against uncertainty (Sarasvathy, 2001). By enabling respondents to state whether they tend towards avoiding or embracing uncertainty, its inclusion enables a balanced cross-examination therefore ensuring that the research captures both decision-making logics without bias.

Exclusion of Prediction Orientation (Causation) The exclusion of Prediction Orientation (Causation) was due to theoretical and practical reasons. Very similar to the exclusion of the Control Orientation dimension on the effectual side for being vague and not very useful in dynamic environments (Arend et al., 2015). Since predictive models are rarely relied on by expert entrepreneurs, who instead focus on adaptability and leveraging available means (Sarasvathy, 2001; Dew et al., 2009), Prediction Orientation is considered to have limited relevance in this study. Moreover, with the exclusion of Control Orientation, its causal counterpart was no longer required for cross-examination, resulting in Prediction Orientation becoming both theoretically and empirically unnecessary.

3.3.1 UPDATED PROPOSITIONS

As the study's focus has shifted towards expert entrepreneurs and revisions have been made to the selected set of dimensions of Sarasvathy's (2001) framework, the initial propositions have been revised as well. The revised propositions align more closely with the current study framework and aim to investigate the potential impact of generative AI on effectual decision-making by expert entrepreneurs in uncertain contexts.

P1: *Expert entrepreneurs who frequently use generative AI are more likely to make strategic decisions based on available means rather than setting pre-defined goals.*

P2: *Expert entrepreneurs who frequently use generative AI are more likely to establish structured, pre-defined goals during the decision-making process."*

P3: *Expert entrepreneurs who frequently integrate generative AI into their workflows are more likely to leverage unexpected events as opportunities rather than threats.*

P4: *Expert entrepreneurs who frequently use generative AI are more likely to engage in preventive strategies aimed at avoiding unexpected developments.*

3.4 DATA SAMPLING

Purposive sampling was used to collect a homogenous group of expert entrepreneurs who operate in the same sector and geographic region, ensuring that the research's objective and the empirical sample were in line. The goal was to reduce the possible effect of external influences and allow for meaningful comparisons among individuals. Mitchell et al. (1996) defined expert entrepreneurs as those with at least two years of entrepreneurial experience or who have created at least three enterprises, at least one of which is still operational and profitable. The selected entrepreneurs all satisfied these requirements. Furthermore, the selected enterprises were located in the Twente region of the Netherlands, which was chosen to maintain geographic consistency.

Initially, the study intended to conduct research with e-commerce entrepreneurs. One such entrepreneur was the subject of a pilot interview. However, the conducted interview showed that this business model frequently entails reselling imported goods with little engagement in product development or value creation. These firms tend to prioritise low-effort, high-profit approaches, which is in conflict with the objectives of this study. Therefore, the decision was made to focus on entrepreneurs who have started their firms from scratch, were actively involved in the founding and development processes, and are clearly adding value in their particular fields.

Furthermore, the decision to investigate marketing agency founders was supported by the relevance of generative AI to their commercial setting. Marketing firms, as service providers that rely largely on creativity, design, and content creation, stand to profit as well as be disrupted by the introduction of generative AI. On the one hand, AI provides potential for improved efficiency, creative growth, and service extension. On the other hand, it threatens to take away traditional agency offers by allowing clients to do previously outsourced duties themselves. This dichotomy, AI as both an asset and a threat, created an ideal environment for investigating how entrepreneurs perceive and respond to technological advances, particularly in terms of decision-making logic.

Finally, fifteen entrepreneurs had been picked for the research. Each participant satisfied Mitchell et al.'s (1996) requirements and founded a marketing agency in the Twente region. These enterprises ranged in age from younger firms to agencies that have been in operation for more than fifteen years. Table 2 below provides an overview of these firms, including their founding year and total number of employees.

Venture	Founded in	Number of Employees
Venture A	2017 – *(8 years)*	80
Venture B	2017 – *(8 years)*	5
Venture C	2008 – *(17 years)*	10
Venture D	2016 – *(9 years)*	10
Venture E	2007 – *(8 years)*	8
Venture F	2020 – *(5 years)*	10
Venture G	2005 – *(20 years)*	140
Venture H	2005 – *(20 years)*	23
Venture I	2020 – *(5 years)*	16
Venture J	2020 – *(5 years)*	2
Venture K	2023 – *(2 years)*	2
Venture L	2019 – *(6 years)*	16
Venture M	2018 – *(7 years)*	8
Venture N	2019 – *(6 years)*	3
Venture O	2005 – *(20 years)*	15

Table 2: Sample overview by founding year and number of employees

3.5 DATA COLLECTION METHODS

Considering the exploratory nature of this study, which explores a relatively underexplored topic, the potential impact of generative AI on expert entrepreneurs' decision-making logic, qualitative data collection was determined to be a suitable methodological approach. When seeking deep, contextual insights into new or complex topics, exploratory studies are well conducted applying qualitative methodologies (Lim, 2024). As this study aims to understand how and why expert entrepreneurs use generative AI into their strategic decision-making, it requires an approach that incorporates personal experiences, subjective reasoning, and context-specific insights.

Semi-structured interviews were chosen for their methodological strength and capacity to collect rich, nuanced data. The study's main question is on how ChatGPT may act as an antecedent variable in influencing expert entrepreneurs' strategic choice for effectuation. However, causation-related issues may still be investigated throughout the interviews for cross-examination, providing for a more in-depth understanding of the entrepreneurial decision-making process.

In order to investigate the role of generative AI in entrepreneurial decision-making throughout several venture stages, this research uses a mixed methods approach that is qualitatively driven. Three complementary data sources are gathered for each respondent as part of the methodological framework, which is based on a triangulation-based convergence model (Turner & Cardinal, 2017): (1) semi-structured interviews coded into frequency tables per phase (ideation, scaling and maturity), (2) a survey evaluating effectual versus causal orientation that was inspired by Brettel et al. (2011), and (3) a phase-specific AI usage survey that mapped the ways in which generative AI influenced strategic behaviour. This combination improves the validity and depth of interpretation by enabling the evaluation of congruence or divergence between survey answers and verbal narratives.

To increase the depth and validity of the mixed-method approach, a second survey was included in the study design. While the first survey was purely concerned with determining the entrepreneurs' overall tendency towards effectuation or causation, it did not examine the role of generative AI or account for changes among entrepreneurial stages. Because the interviews clearly investigated how AI affects decision-making in each step, relying just on the original survey would have restricted analytical depth. As a result, a decision was taken to create and distribute a second, complimentary survey. This extra instrument includes focused questions that asked entrepreneurs if they had employed generative AI for effective (e.g., Means Orientation, Leveraging Contingencies) or causal (e.g., Goal Orientation, Avoiding Surprises) objectives at each phase. The inclusion of this second survey enabled a more precise comparison of qualitative insights and quantitative data, which strengthened the validity of conclusions about the impact of AI on entrepreneurial behaviour.

3.6 DATA ANALYSIS

Given the sample size (n = 15), an intentional methodological decision was made not to analyse the quantitative survey data using statistical tools such as SPSS or R. This viewpoint is backed by Castro et al. (2010)'s methodological guidelines, which emphasises the need of matching analytical methodologies to the type and volume of the data. According to their findings, qualitative research is often idiographic in nature, meaning it focusses on deep understanding of particular situations rather than generalisable tendencies. In such investigations, researchers frequently strive for data saturation, which happens when no new information or patterns emerge from the dataset. This method frequently yields lower sample sizes, typically ranging from 8 to 20 participants, that are appropriate for qualitative depth but insufficient for effective statistical analysis.

Castro et al. (2010) suggest that utilising such "just enough" samples for quantitative processes such as multivariate analysis would be contrary to key statistical concepts and might result in unstable or incorrect results. They specifically point out that, while qualitative depth may be reached with smaller samples (e.g., n = 20-40 for in-depth analysis), effective quantitative statistical analysis, such as multivariate approaches, need considerably larger samples, typically n = 40 to 200. This leaves it methodologically unsuitable to conduct advanced statistical tests like regression or factor analysis on a sample of only 15 entrepreneurs.

Rather of applying weak statistical tests, each entrepreneur's survey results were textually summarised and evaluated considering all of the associated interview findings. The approach was constructed in two levels based on best practices in triangulated mixed methods research (Flick & Garms-Homolova, 2012).

Firstly is a micro-analysis at the case level. The coded interview data of each venture founder was then compared against their respective survey answers. The textual interpretations of the surveys were then used to evaluate strategic orientation (effectual vs. causal) and AI impact per phase. In instances where alignment was observed across data sources, the findings were classified as confirmatory. In instances where discrepancies were identified, analytical memos were utilised to explore potential contextual explanations.

Cross-case macro-analysis is a method of analysing data by examining patterns across multiple cases. Following the triangulation of individual levels, the aggregation of frequencies and the identification of textual themes were conducted for the purpose of detecting phase-based trends across ventures. This approach has enabled the identification of patterns in the recognition of when and how AI acts as an antecedent to effectual or causal behaviour in the context of entrepreneurial decision-making.

Adopting this approach, the study makes a significant contribution to the existing literature by offering both empirical insight and a valid alternative to statistical generalisation through qualitative triangulation. This practice is also defended by Pool et al. (2010), who emphasise that triangulation "enhances accuracy and nuance, especially where quantitative power is limited" (Pool et al., 2010).

3.6.1 JUSTIFICATION OF CODING VALIDITY SEMI-STRUCTURED INTERVIEWS

All interviews were audio-recorded and then transcribed into text. Each transcript was then uploaded to Atlas.ti, where I carefully read and examined every interview from beginning to end. This method enabled me to carefully code each transcript, ensuring that all interviews were carefully analysed and within the correct context.

Sarasvathy (2001), Read et al. (2009), and Dew et al. (2009) provided core definitions of effectuation and causation, which directly guided the coding procedure. Based on these fundamental sources, I created the codebook as shown in Table 16, which I constantly held beside me throughout the transcript analysis. When an entrepreneur made a statement, I looked at the quote's core meaning, intent, and context to see if it reflected effectual tendencies like adaptability, flexibility, opportunity-seeking, or resource-driven thinking, or causal tendencies like risk avoidance, goal-setting, or prediction. Depending on the direction of the answer, I instantly compared the quotation to the definitions in the codebook to identify which of the four dimensions it most closely matched: Means Orientation, Goal Orientation, Leveraging Contingencies, or Avoiding Surprises. This comparison was made in a consistent and structured way, with the codebook kept close by for reference. In cases of doubt, I consulted the original literature to eliminate ambiguity and ensure that each quote was coded under the most appropriate dimension.

4. RESULTS

The main findings of the study are presented in this chapter. Based on the research methods described in the previous chapter, it shows how expert entrepreneurs in the selected sample make decisions under uncertainty. Using information from interviews and two additional surveys, the chapter shows how different decision-making logics appear across various entrepreneurial phases and looks at how generative AI facilitates these processes.

4.1 ANALYSIS INTERVIEW RESULTS

An overview of the frequency of effectual and causal decision-making patterns during the interviews is provided in the frequency table below. Before going into further detail about each stage later in this chapter, it provides a broad overview of how the main aspects appeared in the data, which serves as a starting point for presenting the study findings. It is clear from the data that effectual reasoning was presented far more frequently than causal reasoning. Overall, 262 quotes were associated with causal logic and 613 quotes with effectual logic. This overall difference shows that effectuation had a larger presence in the entrepreneurs' expressions on their decision-making, especially in moments of uncertainty. The larger the number of effectual codes, the more often entrepreneurs employed flexible, resource-driven, and opportunity-focused thinking in their approaches.

	Effectual Dimensions						Causal Dimensions		
	M1	*M2*	*M3*	*MO*	*LC*	*Tot Eff*	*GO*	*AS*	*Tot Cau*
Ideation Phase	43	78	68	189	97	286	68	19	87
Scaling Phase	34	76	48	158	89	247	107	27	134
Maturity Phase	6	24	16	46	34	80	31	10	41
Total	83	178	132	393	220	613	206	56	262

Table 3: Overall frequency table coded interview dimensions

Means Orientation is the most commonly stated dimension in the effectual category. The chart divides Means Orientation (MO) into three subdivisions, M1, M2, and M3, to help make this idea easier to comprehend. These are the main personal assets that business owners use to inform their choices. "Who I am," or M1, refers to the identity, values, and personality of the business owner. M2 stands for "What I know," which encompasses their skills, knowledge, and experience. M3 stands for "Who I know," and it has to do with the entrepreneur's contacts and network. The breakdown makes it easier to see which particular resources were most frequently used during the decision-making process.

According to the totals, the most often utilised resource was "What I know" (M2), which was followed by "Who I know" (M3) and "Who I am" (M1). The entire Means Orientation (MO) score is composed of these three components. These two together with Leveraging Contingencies (LC) determine the overall number of effectual statements for each phase.

The two primary aspects on the causal side are Avoiding Surprises (AS) and Goal Orientation (GO). Compared to their more effectual opposition, these were cited less frequently. The difference between the causal and effectual reasoning serves as the initial indication of the general decision-making approach that will be discussed in further detail in the parts to come.

4.2 RESULTS PER PHASE

This section presents the results per phase of the enterprise: ideation, scaling, and maturity. Based on coded interview data, it displays how effectual and causal decision-making principles appear at each stage.

4.2.1 IDEATION PHASE

	Effectual Dimensions						Causal Dimensions		
	M1	*M2*	*M3*	*MO*	*LC*	*Tot Eff*	*GO*	*AS*	*Tot Cau*
Ideation Phase	43	78	68	189	97	286	68	19	87

Table 4: Frequency of coded dimensions in Ideation

The effective dimensions are as follows: The data indicates a clear preference for effectual reasoning in the ideation phase, with a total of 286 coded segments identified in comparison to 87 for causal reasoning. Within the effectual dimensions, Means Orientation is predominant, with 189 mentions, indicating that founders primarily relied on their existing resources rather than predefined goals. A more detailed analysis of Means Orientation indicates that the statement "What I know" (M2) was the most frequently cited, with 78 references, followed by "Who I know" (M3) with 68 mentions, and "Who I am" (M1) with 43. This suggests that entrepreneurs in the early stages of their ventures primarily relied on their own knowledge and experience, while also leveraging their personal networks and identity. For instance, the owner of Venture B stated: "I am a specialist in this field and possess in-depth knowledge of the various marketing channels, their functionality and practical application. Yes, that knowledge is very relevant, because that's what allows me to now take that next step." Leveraging Contingencies (LC), with 97 instances, also plays a significant role. It is clear that founders were not only focussed on leveraging existing resources, but were also responsive to changes and willing to adapt to opportunities as they arose. When considered as a whole, this distribution demonstrates a high level of adaptability, improvisation and reliance on internal means over external plans. This is in line with the fundamental principles of effectuation in highly uncertain contexts.

Causal Dimensions: With 87 total mentions during the ideation phase, causal logic was evidently fewer frequent but still somewhat apparent. Goal Orientation (GO) accounted for the great majority of these cases (68), indicating that some entrepreneurs did start their businesses with specific goals in mind or later explain their actions by way of goal-setting. This implies that even in early-stage settings, goal-directed planning was possible even while effective thinking predominated. The founder of venture A gave the following example: "But I personally do believe in focus. That’s why in the beginning we only did SEO and SEA – those are the Google organic rankings and the Google paid ads. Over time, a few services were added, but we still try to outsource the smaller services we offer. So I really believe in focus. Basically, I started it from the focus on one specific type of service." However, with just 19 mentions, the dimension Avoiding Surprises (AS) got far less attention. In line with the exploratory character of this stage, this suggests that the majority of entrepreneurs were not concentrated on reducing risk or uncertainty through forecasting or prediction. Ultimately, the evidence points to a selective use of causal reasoning during the ideation stage, with little focus avoiding unforeseen events and mostly in the form of directing goals.

4.2.2 SCALING PHASE

	Effectual Dimensions						Causal Dimensions		
	M1	*M2*	*M3*	*MO*	*LC*	*Tot Eff*	*GO*	*AS*	*Tot Cau*
Scaling Phase	34	76	48	158	89	247	107	27	134

Table 5: Frequency of coded dimensions in Scaling

Effectuation dimensions: With 247 coded examples, effectual reasoning is still relatively common throughout the scaling phase. The dominating orientation is Means Orientation (MO), especially M2 (What I know), which refers to past knowledge and personal competence. This suggests that in order to make decisions while managing growth, entrepreneurs at this stage mainly rely on their past experience. Venture L's founder gave the following example: "And of course, based on my own knowledge. That's the great thing, what I've done for years at various organizations suddenly has to be applied to your own company." Additionally well-represented is Leveraging Contingencies (LC), indicating that adaptability and taking advantage of unforeseen events are still important. These results together demonstrate that entrepreneurs grow their companies by relying on their existing knowledge while being flexible to make adjustments as needed.

Causal dimensions: Causal thinking shows a clear increase during scaling. With 134 instances coded, goal orientation (GO) dominates this logic, indicating a growing focus on setting clear targets, planning strategically, and seeking measurable outcomes. Entrepreneurs in this phase appear to set defined goals in order to structure their growth. The founder of Venture L provides an interesting example of this: 'Everyone in our company also has individual goals. We have a board that shows where we stand. Everyone in the company knows exactly what their goals are each week, what they need to achieve for clients and for internal tasks to help the company grow.' Although Avoiding Surprises (AS) is less common, it still indicates a certain degree of attention to predictability and risk reduction. Overall, the data reflect a shift towards more goal-focused action as companies mature.

4.2.3 MATURITY PHASE

	Effectual Dimensions						Causal Dimensions		
	M1	*M2*	*M3*	*MO*	*LC*	*Tot Eff*	*GO*	*AS*	*Tot Cau*
Maturity Phase	6	24	16	46	34	80	31	10	41

Table 6: Frequency of coded dimensions in Maturity

Effectuation Dimensions: Means Orientation (MO) is the most frequent effectual dimension throughout the maturity phase (which was reported 46 times), with a particular focus on M2 (knowledge and experience, 24 mentions) and M3 (network, 16 mentions). This indicates that at this point, entrepreneurs are more dependent on their network and gathered knowledge than on themselves (M1, just 6 mentions). It shows a practical strategy that uses internal resources that have been shown to be effective to create stability. Interestingly, Leveraging Contingencies (LC, 34 mentions) is still strong, demonstrating that entrepreneurs appreciate flexibility and the anticipated advantage gained from surprises as the company matures. An example provided by Venture H's founder: "Yes, we just run pilots. We simply take the client and say: we'll do this project using the new technique.

Then we pick two colleagues who are open to it. And I just do the project. Because they always find change difficult. But if they say, just do one and let's see if it works out, then it's much more fun. And in the end, we've already done like ten projects."

Causation Dimensions: With 31 citations, Goal Orientation (GO) is truly dominant on the causal side, indicating a significant emphasis on establishing specific objectives and systematically working towards achieving them. "We have multiple KPIs: KPIs for employee satisfaction, customer satisfaction, revenue growth, profit, and also, if I recall correctly, workplace happiness and things like that." Avoiding Surprises (AS) 10, on the other hand, which emphasises minimising unpredictability, appears just ten times. This implies that while predictability is prized to some extent, goal-directed planning, rather than uncertainty avoidance, is the main driver in this stage. Some of these responds are from entrepreneurs who predict how they would behave in the maturity phase when entering it, as their venture finds itself in the scaling phase suggesting that they plan on employing organised goal pursuit extensively.

4.3 VALIDATING ENTREPRENEURIAL ORIENTATIONS THROUGH MIXED METHODS

This section compares the findings of interviews with those of two surveys in order to cross-validate the decision-making logic of entrepreneurs. Firstly, it establishes whether their verbal orientation towards effectuation or causation aligns with their survey responses. Secondly, it explores whether generative AI contributes more to effectual or causal reasoning by examining data from the interviews and a follow-up AI-specific survey. By combining these data sources, this section identifies where decision-making patterns align or diverge across methods and phases.

4.3.1 VALIDATING EFFECTUAL OR CAUSAL ORIENTATION

In the previous paragraph, the coded interview results and the frequency of them were analysed to determine the entrepreneurs' effectual and causal orientations. In this section, the interview findings are compared to the outcomes of the first survey, which focused purely on the effectuation and causation dimensions, namely, means vs goals and leveraging contingencies against avoiding surprises. This comparison enables us to assess the degree to which entrepreneurs' written responds correspond to their verbal comments during the interviews, giving crucial cross-validation of their decision-making approach.

According to the interview analysis in the previous paragraph, entrepreneurs have a strong preference for effectual thinking, with Means Orientation and Leveraging Contingencies outperforming Goal Orientation and Avoiding Surprises. For example, in the mature phase alone, high frequencies in effectual dimensions such as M2 (24) and LC (34) were seen, but causation dimensions like GO (31) and AS (10) were notably absent.

For better readability and understanding, the first survey results have been split into two connected tables. The first table *(table 7)* provides a breakdown of how the 15 entrepreneurs replied to each of the 14 paired statements from the first survey inspired by Brettel et al., (2012), which focused on the effectuation and causation elements. It shows how frequently each score (ranging from strong effectual to strong causal on a 1-6 scale) was chosen for the two core comparisons: Means Orientation vs. Goal Orientation and Leveraging Contingencies vs. Avoiding Surprises. This enables the reader to easily observe how the sample as a whole responded across each dimension.

Effectuation				Causation			
	1	2	3	4	5	6	
Means Orientation	O	O	O	O	O	O	**Goal Orientation**
	37	38	12	8	8	2	
Leveraging Contingencies	O	O	O	O	O	O	**Avoiding Surprises**
	31	43	19	9	3	0	

Table 7: Detailed aggregate frequency table of chosen circles in first survey

The second table below *(table 8)* provides an overview of the findings, aggregating the number of effectual (scores 1-3) and causal (scores 4-6) answers for each dimension. For example, the Means Orientation row totals the number of times participants chose options on the effectual versus causal sides of the survey. This makes it easy to see how strong the overall effectual preference was, particularly for Means Orientation (87 vs. 13) and Leveraging Contingencies (93 vs. 7). The reader can turn to the first table for a more detailed discussion of how these totals were calculated. The appendices provide individual survey results for each respondent.

	Effectual	Causal
Means Orientation	87	
Leveraging Contingencies	93	
Goal Orientation		18
Avoiding Surprises		12
Total	180	30

Table 8: Aggregate frequency table of chosen circles in first survey

This distribution strongly mirrors the interview data, suggesting high consistency across both data sources.

Key comparative insights:

- **The dominance of Leveraging Contingencies (LC):** LC is not only the most frequent dimension of the survey (93), but it was highly coded in the interview analysis as well (97 in the ideation phase). This shows that entrepreneurs obviously prefer leveraging uncertainties rather than avoid it, a characteristic of effectual thinking.
- **Strong Preference for Means Orientation (MO):** The survey's MO score of 87 corresponds to the frequency with which available resources are mentioned in interviews. It is evident that entrepreneurs are guided more by their personal and professional networks than by rigid long-term goals.
- **Causal Elements Remain Minor**: It is evident that both GO and AS are noticeably underrepresented in the survey. With just 30 answers combined, a pattern that mirrors interview frequencies (e.g., 41 causal vs 80 effectual in the mature phase). This underscores the view that few entrepreneurs are committed to thorough planning or uncertainty avoidance.

The comparison shows a high level of consistency between the interviews and the initial survey. Entrepreneurs make effectual decisions, particularly in terms of leveraging on emerging opportunities and operating within existing resources.

4.3.2 CROSS-VALIDATION OF AI-DRIVEN DECISION-MAKING

The purpose of this comparative analysis is to determine whether generative AI is a driving force behind entrepreneurs' preference for effectual or causal thinking. The foundation of this is a comparison of the frequencies of effectual and causal use of generative AI as indicated by entrepreneurs in interviews with their self-reported usage in the second survey.

4.3.2.1 INTERVIEW AI RESULTS

Ideation Phase: The results are generally balanced, with a little preference for causality (22 vs. 19). This shows that early-stage entrepreneurs use AI for both opportunity discovery and strategic goal-setting, with a slight preference for planning.

- **Causation Quote**: *"Yes, purely to write out my plan clearly and explicitly, to list things, to really create a timeline. To actually lay out a path. And also to brainstorm with AI to clearly define a goal together, because that's important."*
- **Effectuation Quote**: *"What I would do is define the roles within a company, you can specify them, but you can also use AI for that... You get advice from these roles, even if you're a solo entrepreneur."*

Scaling Phase: A strong tendency for effectuation (57 to 25). AI is obviously employed here as a flexible facilitator, facilitating improvisation, automating content and process development, and speeding up decision-making depending on available resources.

- **Effectuation Quote**: *"We started training GPT as a copywriter for a specific client. So, we define brand values for that client, feed them into the model, and basically have a personalized copywriter for Client A. Then we just say: make a post about this meeting with the client. We give the input, and it generates a draft. We fine-tune it, check with the client, but it saves us a lot of time."*
- **Causation Quote**: *"Since this year we have been using AI much more to help us create a roadmap, think through processes, iterate with it, 'how could we organize this?' all the way to generating workflows in an automation tool."*

Maturity Phase: Once again, effectuation (31) somewhat dominates causation (21), indicating that entrepreneurs in this stage are increasingly using AI as a thinking partner and internal means of learning and insights production.

- **Effectuation Quote**:
  "I mainly use it in an advisory role. So, as I just described, if something happens in the middle of the week and I don't know how to handle it, financially, HR-wise, or operationally, I ask ChatGPT as a sparring partner."
- **Causation Quote**: *"So when I was setting targets for the entire year 2025, I also included a number of important milestones on the roadmap. I then asked ChatGPT how to motivate the team to align with those targets. So I definitely use it for that purpose too."*

	AI-Enabling Effectuation	AI-Enabling Causation
Ideation Phase	19	22
Scaling Phase	57	25
Maturity Phase	31	21
	107	68

Table 9: Frequency table AI for effectual or causal purposes mentions in the interviews

4.3.2.2 SECOND SURVEY RESULTS

Ideation Phase: Nearly equivalent ratings (12 vs. 11) indicate a dual use, AI in both leveraging opportunities and establishing clear paths to market engagement.

Scaling Phase: According to the interviews, effectuation (13) outweighs causation (7), highlighting AI's contribution to adaptive development and resource leveraging.

Maturity Phase: Opposing the interview data, causation dominates here (17 vs. 12), showing a larger emphasis on control, according to the AI survey responds.

	AI-Enabling Effectuation	AI-Enabling Causation
Ideation Phase	12	11
Scaling Phase	13	7
Maturity Phase	12	17
	37	35

Table 10: Frequency table AI for effectual or causal purposes based on filled out second survey

4.3.2.3 INTERPRETIVE ANALYSIS BY ENTREPRENEURIAL PHASE

Ideation Phase

Interview data: The interview data reveals slightly more causation instances (22) than effectuation instances (19). This suggests that, in the early stages of a venture, entrepreneurs often rely on AI to help them structure their ideas, define their goals and formalise their business concepts. AI is viewed as a planning tool that provides clarity and predictability in the uncertain ideation phase. Statements such as *"To clearly define a goal together, because that's important"* or *"to write out my plan clearly and explicitly, to list things, to really create a timeline"* illustrate this causation-oriented application.

Survey data: Survey responses in this phase are evenly split: 12 favour effectuation and 11 causation. This balance illustrates a dual role for AI. While some respondents mirror the structured, goal-oriented logic observed in interviews, others emphasise AI's potential for creative ideation and role simulation. One entrepreneur notes, *"Say you want to start company X and you tell the AI: behave like a CFO… You get advice from these roles,"* reflecting a highly means-driven and effectual use of AI.

Interpretation: During the ideation phase, the results of both interviews and survey answers agree on the dual utility of AI. Entrepreneurs utilise it to both see new possibilities and put those ideas into organised, actionable strategies. This interaction between effectuation and causation represents the inherent uncertainty of early-stage entrepreneurship, which combines open-ended exploration with goal-directed planning. AI is not limited to a single logic, but rather functions as a hybrid instrument that permits both strategic thought and improvisational creativity.

Scaling Phase

Interview data: Effectuation is clearly dominant in this phase, with 57 mentions compared to 25 for causation. Entrepreneurs describe AI as a mechanism for agility, used to prototype services, to automate tasks, to train tools and to reconfigure teams, all without the need for detailed forecasts. For instance, the statement, 'We trained GPT as a copywriter for a specific client... and that saves a lot of time,' exemplifies the dynamic experimentation with processes that AI enables through the leveraging of available resources.

Survey Data: The data confirms the interview results, with 13 effectuation and 7 causation. Respondents characterise AI as a flexible assistance that enables quicker iterations and refines solutions via real-time learning. Although some structure is present (for example, AI used for roadmap creation), the majority of firms employ AI to drive adaptive execution and creative scaling.

Interpretation: Both interviews and surveys majorly agree on this stage. AI greatly facilitates effectual entrepreneurship throughout the scaling phase. This involves leveraging contingencies and quick iteration. AI helps entrepreneurs to move quickly, create prototypes, and continually test assumptions. The lower frequence of causation in this phase, suggests that planning takes a back seat to emerging, experimentation-based growth.

Maturity Phase: Interview data indicates that effectuation remains somewhat ahead in the Maturity Phase (31 vs. 21), contrary to predictions. Entrepreneurs continue to use AI as a sparring partner, especially for contextualising choices, overcoming unexpected difficulties, and mentoring staff. The use of AI for advisory help emphasises adaptive reflection and personalised guidance, even in stable organisations (e.g., "I use it in an advisory role… when I don't know how to handle something").

Survey Data: On the contrary, the AI survey data shows a clear reversal: causation (17) has surpassed effectuation (12). Entrepreneurs show how they use artificial intelligence to formalise internal procedures, align strategic goals, and improve performance results. For example, one responder described how AI assisted them in "including a number of important milestones on the roadmap" and then aligning the team with those goals, both of which are traditional features of planning.

Interpretation: The difference between interview and survey (AI-related) data in the maturity phase is large. While interviews indicate that adaptive usage of AI is still useful, survey respondents seem to prioritise strategic improvement, characteristics of causational logic. This might be due to differences in how individuals describe their behaviour in conversations with more context vs surveys (which may promote simpler categorical thinking). The difference reveals an important insight: AI's role is shifting, with maturity bringing more structured, ROI-driven usage, while person-centred applications remains.

4.3.2.4 CROSS-PHASE SYNTHESIS: CONSISTENCY AND DIVERGENCE

Phase	Interviews (Effectuation/Causation)	Survey (Effectuation/Causation)	Pattern
Ideation	19 / 22	12 / 11	Balanced in both
Scaling	57 / 25	13 / 7	Strong alignment on effectuation
Maturity	31 / 21	12 / 17	Divergence: effectuation in interviews, causation in surveys

Table 11: Consistency and divergence AI for effectual or causal orientation interview vs second (AI) survey

Partial Alignment: During the ideation phase, both the interviews and surveys illustrate AI's balanced, dual-purpose function in facilitating both adaptation and formal planning. This proposes an elaborate usage of AI that is context-dependent and has mixed logic.

Consistency: The scaling phase has the most consistency across data collection methods. Both data sources illustrate AI as a dynamic facilitator of leveraging means and contingencies, all of which are key tenants of effective reasoning.

Divergence: Data diverges throughout the maturity phase. Interviews demonstrate the continuous usage of AI for informal, adaptable activities, while surveys focus on strategic planning and surprise avoidance. This might reflect a shift in perspective: entrepreneurs may "act effectually" while characterising their organisations in more formal, goal-oriented terms while filling out a survey.

4.4 OVERVIEW SAMPLE

The table below provides a structured overview of the research sample made up of 15 marketing agency founders from the Twente region in the Netherlands. This whole sample qualifies as expert entrepreneurs according to Mitchell's (1996) definition, which defines experts as those who have been entrepreneurs for at least two years and/or started three or more companies, at least one of which is still operating and profitable. For further clarity and structure, the table presents each venture's founding year, current age (in years), number of employees and classifies each entrepreneur's decision-making orientation as effectual or causal.

This orientation has been determined using two separate methods: semi-structured interviews and a structured survey (Survey 1) that examined each entrepreneur's typical approach to decision-making in uncertain circumstances. A final column summarises how each entrepreneur uses or intends to use generative AI, drawing on comments from both the interview (contextualised use cases) and an additional questionnaire (Survey 2). These two sources were then examined to determine which decision-making logic (effectuation or causation) was more dominant in their employment of generative AI.

Furthermore, the table contains a "experience group" column that categorises each entrepreneur according to numerous definitions of entrepreneurial competence beyond Mitchell (1996), including more strict criteria proposed by Ericsson (1993), Dew et al. (2015), and Dew et al. (2009). This was done to enable readers to interpret the findings through numerous theoretical lenses and determine whether differences in experience levels or company size are associated with strategic orientation or AI adoption behaviours. Further details per entrepreneur can be found in the appendices.

Venture	**Founded in**	**# of Employees**	**Experience Group**	**Orientation (E vs C)**	**AI Usage (E vs C)**
Venture A	2017 – (8 years)	80	≥5 years	Effectual	Both Equally
Venture B	2017 – (8 years)	5	≥5 years	Effectual	Mixed
Venture C	2008 – (17 years)	10	≥15 years	Effectual	Effectual
Venture D	2015 – (10 years)	10	≥ 10 years	Effectual	Effectual
Venture E	2007 – (8 years)	8	≥5 years	Effectual	Causal
Venture F	2020 – (5 years)	10	≥5 years	Effectual	Causal
Venture G	2005 – (20 years)	140	≥15 years	Effectual	Both Equally
Venture H	2005 – (20 years)	23	≥15 years	Effectual	Effectual
Venture I	2020 – (5 years)	16	≥5 years	Effectual	Effectual
Venture J	2020 – (5 years)	2	≥5 years	Effectual	Mixed
Venture K	2023 – (2 years)	2	<5 years	Effectual	Effectual
Venture L	2019 – (6 years)	16	≥5 years	Effectual	Mixed
Venture M	2018 – (7 years)	8	≥5 years	Effectual	Mixed
Venture N	2019 – (6 years)	3	≥5 years	Effectual	Causal
Venture O	2005 – (20 years)	15	≥15 years	Effectual	Causal

Table 12: Detailed overview data sample

Definition of 'Expert' Entrepreneurs	# of 'expert' in this sample per definition
Mitchell (1996) - ≥2 years	15
(Ericsson, 1993) – 10,000 hours (≥5 years)	14
Dew et al. (2015) - ≥ 10 years	5
Dew et al. (2009) - ≥ 15 years	4

Table 13: Overview four different definitions of 'expert' entrepreneur by years of experience

4.4.1 SIMILARITIES

Two notable similarities emerge from the whole sample of 15 entrepreneurs: an unanimous commitment to effectual logic and a shared involvement with generative AI. Every entrepreneur in this study was characterised as "Effectual" in their strategic orientation, based on combined findings from the interviews as well as the initial survey. Not a single entrepreneur had a strong "Causal" attitude. The consistency extends over a broad range of experience levels, from younger ventures of which their founders have less than five years of entrepreneurial experience (e.g., Venture K) to highly experienced entrepreneurs with 15 or more years of operation (e.g., Ventures C, G, H, and O). This consistency suggests a sector-wide compliance with effectuation principles, which are defined by adaptability and actions driven by means. This perspective possibly reflects the reality of the marketing sector, where uncertainty, client-specific demands, and rapid changes make strict, goal-based planning less effective.

Equally consistent is the acceptance and implementation of generative AI across all businesses, regardless of size or age. From micro-firms like Venture J and K (with just two employees) to the largest venture, Venture G (140 employees), every entrepreneur stated either current usage or particular plans to use generative AI platforms (such as ChatGPT). None of the interviewees expressed unfamiliarity or disinterest with AI, indicating that its perceived strategic value is present, even to those working with little resources. These results hint to a common strategic attitude that combines effectual reasoning with a openness to generative AI integration, indicating a consistent tendency among this entrepreneurial community.

4.4.2 DIFFERENCES

A modest but noteworthy difference emerges in terms of firm size and AI usage. The two biggest ventures, Venture G (140 employees) and Venture A (80 employees), were the only ones that reported adopting generative AI in a balanced way, for both effectual and causal reasons equally. Smaller organisations, on the other hand, demonstrated a more diverse attitude, either using AI primarily for effectual or causal purposes, or falling into a "mixed" use pattern, where results in interviews and surveys diverged. While this is not proof of an immediate relationship, it does indicate that bigger organisations may have stronger strategic ability to incorporate AI across multiple decision-making logics at the same time.

Besides that, the data does not support the identification of major differences in experience levels or founding age. Although the majority of the enterprises have 5-10 years of experience, this distribution does not result in a notable difference in orientation or AI utilisation. As a result, apart from the potential effect of firm size, no major difference can be determined within the this data sample.

4.5 OVERVIEW EXAMPLE QUOTES PER PHASE AND AI USAGE

This paragraph offers two tables presenting sample quotes relating to the four examined dimensions: Means Orientation, Goal Orientation, Leveraging Contingencies, and Avoiding Surprises. The first table contains quotes from the founders of various ventures, structured by phase (Ideation, Scaling, and Maturity) and decision-making logic (Effectuation and Causation). Each quotation demonstrates how the entrepreneur operates according to a specific dimension in a specific phase of the venture. The second table displays how generative AI is applied to support or enable these four dimensions, along with a few illustrative quotations from the interviewees. This paragraph is intended to provide the reader with a categorised overview of representative statements and examples, rather than reaching any new conclusions.

MO = Means Orientated GO = Goal Orientated LC = Leverage Contingencies AS = Avoiding Surprises				
	Effectuation		**Causation**	
Ideation Phase	*MO*	*Venture D: "Because I know how to do it. And because I had done it for someone else. And then you realize that you know something others don't. And you think, well, if you know it and know how to do it, then you might as well do it yourself."*	*GO*	*Venture B: "I am someone who plans and organizes, and then places each dot on the horizon and builds towards it''*
	LC	*Venture D: "That's a quote from Richard Branson: If someone offers you something for money today, say yes today and figure out how to do it tomorrow."*	*AS*	*''Venture C: "So we did make that choice back then based on the risk involved. The kind of risk you face as an organization when you're dependent on a single major supplier, actually."*
MO = Means Orientated GO = Goal Orientated LC = Leverage Contingencies AS = Avoiding Surprises				
	Effectuation		**Causation**	
Scaling Phase	*MO*	*Venture E: "I simply started with what I already knew and who I already knew in the industry. I used that network to find my first clients. I didn't have a big plan; I just wanted to build something based on my existing knowledge."*	*GO*	*Venture A: "But I think we had our goals even more clearly defined back then, partly because we applied the Scaling Up phase and its rhythms more effectively. We followed strict weekly, monthly, and annual routines."*
	LC	*Venture A: "For us, it happened in a very short timeframe, within a month or even sooner, that webshops, which made up about 60% of our client base, realized that everything online was skyrocketing, except for sectors like hospitality. So we responded by scaling up significantly."*	*AS*	*'Venture G: "So the moment you strategically choose to lower client concentration, meaning, instead of having one client make up 80% of your business, you choose to have multiple clients together account for that 80%, your risk profile decreases. So that's a strategic decision."*
MO = Means Orientated GO = Goal Orientated LC = Leverage Contingencies AS = Avoiding Surprises				
	Effectuation		**Causation**	
Maturity Phase	*MO*	*Venture O: "Your initial network is the most important for advice and those kinds of matters. And you always rely on it."*	*GO*	*Venture O: "You also start making things more measurable and reviewing them periodically, instead of just living day by day and occasionally analysing. Whereas we used to do a thorough analysis once a year and make a plan for the following year, we now do that every month."*
	LC	*Venture H: "Yeah, we just run pilots, so we simply take the client. Then we say: this project, we're going to do it using the new technique. Then we pick two colleagues who are open to it. And I just carry out a project, because people usually find change difficult. But if you say: let's just do one and see if we'll really move forward with it, then it's a lot more fun. And in the end, we've already done around ten projects."*	*AS*	*''Venture G: "Yes, we very clearly sat down with the management team, laid the crisis on the table, and looked together at how we could incorporate smart strategies into the organization, involve clients in that as well, and then, rather than meeting monthly with the executive team, we started meeting weekly, giving feedback weekly, and tightening the loop even further."*

Table 14: Example quotes from the interviews per dimension per phase effectuation vs causation

MO = Means Orientated GO = Goal Orientated LC = Leverage Contingencies AS = Avoiding Surprises				
AI usage Effectual or Causal	**AI Enabling Effectuation**		**AI Enabling Causation**	
	MO	*Venture G: "I want all my knowledge, all my decisions, all my thoughts to go into that tool, so it can act on my behalf."*	*GO*	*Venture M: "Mainly just my plan, writing it down clearly and explicitly, listing things out, and really creating a timeline. Really mapping out a path. And also sparring with an AI to clearly arrive at a goal together, because that's how it is."*
	LC	*Venture A: "But I do think you have to force yourself to learn and embrace this, in order to keep up with those technological developments."*	*AS*	*"Venture N: "Because when it comes to risks, if you don't have experience in a certain field, you don't even know what to consider in terms of risks. So then you might ask (ChatGPT): are there things I haven't thought of that could come up? And then it comes back with really strong points, like insurance, technical matters, saying: hey, pay attention to this. So those kinds of things are really useful."*

Table 15: Example quotes from the interviews AI usage per dimension

5. DISCUSSION AND IMPLICATIONS

This chapter provides a thorough interpretation of the study's findings, linking them to existing theories on entrepreneurial decision-making. It contains a critical discussion that is structured around the four key decision-making dimensions. It also proposes an extension to Sarasvathy's effectuation model and outlines the theoretical and practical implications of the study. This chapter addresses its limitations and suggests directions for future research. Finally, it evaluates the propositions and answers the central research question.

5.1 DISCUSSION

The key findings of the research are reflected on in this chapter, with links being made to the literature on entrepreneurial decision-making, particularly Sarasvathy's (2001) effectuation framework, and prior studies on the use of generative AI in entrepreneurship. The discussion has been structured around the four decision-making dimensions that have been examined in this study: Means Orientation, Goal Orientation, Leveraging Contingencies and Avoiding Surprises. Each is evaluated in line with the research results and associated theoretical expectations.

From my perspective, the findings show a persistent dominance of effective logic, particularly Means Orientation and Leveraging Contingencies, across all stages of the entrepreneurial process. I think that this effectual dominance is consistent with Sarasvathy's (2001) view that expert entrepreneurs, who have more experience, have a greater ability to act on contingencies, improvise, and use existing resources rather than sticking to predetermined goals.

During the ideation phase, entrepreneurs relied heavily on personal skills and networks. I believe that this confirms previous research by Chandler et al. (2011), who argue that iterative, learning-driven approaches are more beneficial to early-stage companies than predictive strategies. While Goal Orientation was common, it occurred more often in reflective stories than in forward planning, to me that indicates that entrepreneurs redefine their early-stage activities to suit a structured logic looking back. During scaling, effectuation remained dominant, but it was now closely coupled with parts of causal logic. The growing use of Goal Orientation shows a shift towards structuring activities to fit with organisational development goals.

Interestingly, in the maturity phase, although interview data remained orientated towards effectuation, survey data revealed a move to causal reasoning. Entrepreneurs highlighted AI-powered performance monitoring, organised team management, and strategic roadmap building as characteristics of goal-driven planning. This difference leads me to argue that, although day-to-day improvisation may exist in mature organisations, entrepreneurs become more conscious of or motivated to apply strategic discipline when reflecting in more organised forms such as surveys. A discovery from this research is the function of generative AI. My interpretation of the results is that AI is used not just as a tool for execution, but also as a cognitive extension that influences how entrepreneurs make choices.

AI was employed for both opportunity finding and planning throughout the ideation process, demonstrating its dual functionality. Entrepreneurs used AI to mimic jobs, brainstorm with "CFO personas," and map out product-market strategy. This highlights AI's ability to assist both effectual (e.g., improvisational creativity) and causal (e.g., structured roadmap creation) acting. I believe that such use of AI in strategic conceptualisation is consistent with literature in entrepreneurial thinking, which views digital tools as supportive agents (Ghezzi & Cavallo, 2020).

What I find notable is that the scaling phase had the most consistent alignment across interviews and surveys. Entrepreneurs actively leveraged artificial intelligence for content creation, prototyping, as well as iteration. I therefore believe that AI here serves as a contingency-leveraging facilitator, increasing the pace and creativity with which entrepreneurs respond. I think that this supports the idea that digital technology increases entrepreneurial agility (Nambisan, 2017).

During the maturity period, however, I found that the results differed. While entrepreneurs in interviews referred to AI as a "thinking partner", the survey answers focused on structured planning and performance optimisation. This dichotomy, in my opinion, represents a nuanced development in AI usage as the entrepreneurs alternated between using AI as a reflective sparring partner and as a data-driven decision-making tool. Building on the results of this study, I believe that generative AI is a versatile tool that dissolves the line between predefined and spontaneous strategy.

Means Orientation: The results show that expert entrepreneurs frequently utilise generative AI in ways that are consistent with Means Orientation. Participants provided descriptions of the use of tools like ChatGPT for the optimisation of internal processes, the development of ideas, or the exploration of new opportunities based on existing resources, such as skills, networks, or knowledge. This is in line with Sarasvathy's (2001) argument that expert entrepreneurs often start with the resources they already have instead of setting specific goals. These findings support Dew et al. (2009), who discovered that experienced founders usually start with "who they are, what they know, and whom they know." Many respondents regarded AI as a resource that can be easily incorporated and utilised, which matches with this strategy.

Goal Orientation: Although the study focused on expert entrepreneurs who are usually associated with effectual logic, a relatively large proportion also displayed tendencies towards goal orientation as well. Various participants mentioned to have utilised AI tools for structured planning. The hybrid logic suggested by Reymen et al. (2015) is partially confirmed by this, as it was argued by them that one logic is not strictly followed by entrepreneurs, but rather shifts are made between effectual and causal approaches depending on the situation. In situations where things are easy to predict or are consistent, it is important to make a plan, even for entrepreneurs who have a lot of experience. This logic was discovered to be facilitated by generative AI, which helped the entrepreneurs with planning, strategy formulation, and performance monitoring.

Leveraging Contingencies: Various expert entrepreneurs emphasised how generative AI allows them to react to unforeseen developments and generate new possibilities, which is consistent with the dimension of Leveraging Contingencies. This supports Sarasvathy's (2008) idea of "learning by doing," in which entrepreneurs adjust as conditions change. AI is being used in a spontaneous way by interviewees, for example, in reacting to sudden shifts in the market or the needs of clients. The same can be said of the findings of Fisher (2012), who also noted that taking advantage of unexpected changes is a key feature of expert entrepreneurial behaviour in uncertain environments. The fact that generative AI is both used as a tool for creating opportunities and for dealing with surprises shows how important it is for coming up with adaptive strategies.

Avoiding Surprises: Despite being excluded from the conceptual model initially, Avoiding Surprises was subsequently incorporated to facilitate balanced cross-examination. The findings demonstrate that some expert entrepreneurs purposefully employ AI to decrease uncertainty by testing ideas before their implementation. This is in line with Sarasvathy's (2001) idea that even expert entrepreneurs might use preventative strategies to reduce potential risks. These results are also relevant to Brettel et al. (2012), who warned that an overemphasis on risk avoidance might restrict flexibility. However, in this research, Avoiding Surprises was not demonstrated to be the dominant decision-making strategy, but rather to complement more flexible strategies.

Cross-Logic Behaviour: It is suggested by the empirical data that strict adherence to either effectual or causal logic is not demonstrated by expert entrepreneurs. Instead, hybrid behaviour is demonstrated, with selection and switching between both decision-making logics depending on the given context and available tools. This is consistent with the views of Chandler et al. (2011), who emphasised the flexibility of decision logics among experienced entrepreneurs. Using AI seems to make this even easier, as it lets people use both types of logic at the same time. Overall, the research demonstrates that expert entrepreneurs use generative AI in many context-dependent ways. Although there is much evidence of effectual tendencies, like Means Orientation and Leveraging Contingencies, there are also elements to causal logic, including Goal Orientation and Avoiding Surprises.

5.1.1 MY REFLECTION ON THE FINDINGS

Looking back at the study's findings, I believe the clearest lesson is that the expert entrepreneurs do not follow strict decision-making models. Instead, what this study demonstrates, in my view, is the flexible and dynamic mindset of expert entrepreneurs and how generative AI seems to strengthen that flexibility even more. I found it particularly interesting that Means Orientation and Leveraging Contingencies were of such importance across all phases. This demonstrates that expert entrepreneurs strongly rely on their own expertise, networks, and adaptability, and that AI is seen as an extension of those current skills rather than a replacement. What sticks out to me is that AI doesn't seem to be limited to one strict decision-making logic. It helps the entrepreneurs in planning as well as improvisation, depending on the circumstances. I believe this shows that AI stimulates hybrid thinking as entrepreneurs can easily switch between defining goals and adapting spontaneously when they need to. I believe the findings from the maturity phase are quite interesting. The fact that entrepreneurs call AI a "thinking partner" and a "strategic planner" illustrates that AI's role evolves as the firm grows. In my perspective, this shows that we're witnessing a change in how entrepreneurs deal with uncertainty and not by fearing it, but by working with it, utilising tools like AI to be innovative but still in control. This, I think, teaches us that future entrepreneurial theory and education must completely embrace digital technologies as active components of strategic reasoning, rather than as external additions.

5.1.2 PROPOSED EXTENTION TO MEANS ORIENTATION

Means Orientation, as defined in effectuation theory, relates to how entrepreneurs make choices and act based on their available resources. Sarasvathy (2001) divides it into three sub-categories: Who I Am (personal characteristics and identity), What I Know (knowledge and experience), and Whom I Know (social networks). These sub-dimensions contribute to understanding how entrepreneurs operate in the context of uncertainty by starting with their available resources.

This study made it clear that generative AI, like ChatGPT, is a tool used by many expert entrepreneurs to operate in an adaptive and flexible (effectual) manner. Given that Means Orientation is all about making use of the resources you already have at your possession, one may conclude that generative AI could fall under Means Orientation as well. However, it does not appear to fit under any of the three current subcategories of Means Orientation. The focus here is not on the entrepreneur's individual qualities, expertise or connections, rather, it is a resource that they can utilise. This highlights a gap in the present framework. As a result, a new subdimension called *'What I Have'* is suggested. This concerns resources or tools an entrepreneur can utilise, such as AI platforms, which can be employed to act effectually in situations of uncertainty. As technology plays an increasingly important role in entrepreneurship, this fourth dimension could complete and modernise the Means Orientation principle.

5.2 THEORETICAL IMPLICATIONS

This study provides a recent and important addition to the concept of effectuation by proposing generative artificial intelligence, more specifically ChatGPT, as a new antecedent to effectual decision-making. Even though Sarasvathy's (2001) original framework primarily focused on internal resources like expertise, identity, and networks, this research shows that external technological tools can also impact entrepreneurs' decision-making processes. The study specifically aims to bridge the gap in the literature identified by Grégoire and Cherchem (2019), who emphasised the need for a more in-depth exploration of the antecedent variables that trigger effectual thinking beyond expertise.

The findings of this research indicate that generative AI has the potential to function as such a variable: it empowers entrepreneurs to act with agility in uncertain environments, turning unpredictability into opportunity, and optimising the use of their available resources. This research therefore not only validates the growing integration of artificial intelligence tools into entrepreneurial practice but also offers conceptual proof that such technologies may actively stimulate effectual behaviours. This contributes to theory by demonstrating how technological developments may be important antecedents of effectuation. The results indicate that expert entrepreneurs employ AI to facilitate Means Orientation and Leveraging Contingencies, which are fundamental dimensions of effectuation, particularly during the ideation and scaling phases. Importantly, the study puts forward a refinement of the concept of 'Means Orientation'. This extension has two theoretical contributions. Firstly, it modernises effectuation theory by incorporating digital advancements that were not yet relevant when Sarasvathy developed her original framework. Secondly, it increases the practical relevance of the framework by acknowledging that entrepreneurs' resources have evolved, with generative AI tools becoming standard components of the entrepreneurial toolkit. The formal recognition of 'What I Have' as a new form of entrepreneurial means results in greater alignment of the framework with current entrepreneurial realities and provides a deeper, more up-to-date lens for future study.

5.3 PRACTICAL IMPLICATIONS

Integrating generative AI tools, such as ChatGPT, into the curriculum is one way to enrich entrepreneurship education. Rather than focusing exclusively on theoretical knowledge, programs may educate students on how to utilise AI tools to explore new ideas, adapt to change, and make strategic choices with their existing resources. This approach encourages the development of an effectual mentality while also preparing students for the unexpected nature of real-world entrepreneurship. Additionally, regional business associations and support groups bringing together small and medium-sized businesses to share knowledge, offer training, and exchange real-world experience may find great value in the insights of this study. Such associations can use the findings to develop programmes to help entrepreneurs adopt generative AI tools responsibly and effectively, thereby maximising their impact on adaptability, decision-making and opportunity recognition in a rapidly changing environment.

This study has illustrated that, when used effectively, generative AI has the potential to enhance entrepreneurial adaptability by assisting entrepreneurs in leveraging their available resources and turning uncertainty into opportunity. Using these insights, such associations could organise workshops, peer learning sessions, or practical training programmes to help members experiment with and learn from each other's use of AI. This would ultimately help to build stronger and more flexible entrepreneurial ecosystems within their region.

5.4 LIMITATIONS AND FUTURE RESEARCH

Despite the valuable insights this study provides into how generative AI is applied by expert entrepreneurs to stimulate effectual and causal decision-making, there are a few limitations that should be acknowledged as well. The criteria for what actually makes an entrepreneur a real "expert" entrepreneur is an area of potential limitation. While Mitchell et al. (1996) provided a clear and generally agreed upon definition, other researchers use different standards based on the number of years of experience or businesses started. This makes it hard to determine precisely where being a novice entrepreneur specifically stops when becoming an expert actually starts. In future studies, researchers might delve deeper into this matter by comparing various definitions and looking at how differences in entrepreneurial experience affect the way entrepreneurs make decisions.

Once the ultimate distinction between both groups is made, future research should explore behavioural differences between novice and expert entrepreneurs, particularly in their interaction with generative AI. Comparative analyses can then be made to examine if novice entrepreneurs employ generative AI in a more goal-orientated, causal way, while expert entrepreneurs utilise it more flexibly and adaptively in accordance with effectual logic.

This is an assumption that is grounded in effectuation theory, and it suggests that, due to a lack of experience, novice entrepreneurs may be more inclined to rely on predefined goals and linear planning, with AI being used primarily to minimise uncertainty or confirm established ideas. Expert entrepreneurs, on the other hand, could be more capable of interacting with AI tools in a more dynamic way, using them to explore opportunities and adapt to unforeseen circumstances.

Researchers could test such hypotheses through controlled experimental setups, where they classify participants as either novice or expert and assign them problem-solving tasks involving generative AI tools. For instance, 'think-aloud' tasks during the execution of these tasks could provide valuable insights into the participants' cognitive processes and their real-time decision-making strategies. Combining such behavioural data with verbal reasoning enables researchers to gain a better understanding of the underlying motives that guide AI use among different entrepreneurial groups.

5.5 CONCLUSION

This last chapter summarises the research's key conclusions, based on the results described in the previous parts. It responds to the core research question and analyses the four propositions presented in the methodology chapter.

The presented study looked into the role of generative AI, particularly ChatGPT, as a potential antecedent to effectual decision-making among expert entrepreneurs dealing with uncertainty. The results indicate a strong link between AI use and two fundamental elements of effectuation: Means Orientation and Leveraging Contingencies. Participants often used generative AI to explore options based on the resources they had and to adapt quickly to unexpected events, especially in the early phases of their business, like the ideation and scaling phase. While causal approaches, such as structured goal-setting, emerged in the scaling phase, effectual logic remained dominant. This study contributes to existing theory by proposing an additional sub-dimension of Means Orientation, called “What I Have,” to reflect the increasingly important role of modern technologies such as generative AI as actual business resources. By doing so, the literature gap that was identified by Grégoire and Cherchem (2019) has been addressed and Sarasvathy's (2001) foundational framework has been modernised. These observations aid in developing a more up-to-date awareness of business choices in tech-driven settings, where hybrid and adaptive strategies are crucial.

P1: *Expert entrepreneurs who frequently use generative AI are more likely to make strategic decisions based on available means rather than setting pre-defined goals.*

P1 = Accepted: The data showed that expert entrepreneurs who often use generative AI tend to make decisions that are based on the resources available to them, rather than following pre-set objectives, especially during the ideation phase. This behaviour is in line with the fundamental principles of effectual logic, where flexibility and resource-based reasoning are key.

P2: *Expert entrepreneurs who frequently use generative AI are more likely to establish structured, pre-defined goals during the decision-making process.*

P2 = Partially accepted: While there is occasional use of generative AI to support structured, goal-driven strategies, especially in the scaling phase, this occurrence is not as consistent across all respondents. The findings suggest a hybrid usage pattern, whereby AI facilitates both goal- and means-driven behaviours, depending on the context.

P3: *Expert entrepreneurs who frequently integrate generative AI into their workflows are more likely to leverage unexpected events as opportunities rather than threats.*

P3 = Accepted: It is indicated by the findings that AI is leveraged by expert entrepreneurs to respond proactively to surprises, with unexpected developments being reframed as potential opportunities. This is consistent with the effectual principle of leveraging contingencies.

P4: *Expert entrepreneurs who frequently use generative AI are more likely to engage in preventive strategies aimed at avoiding unexpected developments.*

P4 = Rejected: Most entrepreneurs did not use generative AI to avoid surprises through preventative planning, despite common assumptions. Instead, they welcomed uncertainty and made quick adjustments, thereby strengthening their focus on effectuation over prediction.

Central Research Question: *'To what extent can generative AI serve as an antecedent variable for effectuation in the decision-making of expert entrepreneurs?'*

It has been found that generative AI can, in fact, function as a new antecedent to effectuation. It enables entrepreneurs to think and act based on their current means. It also allows them to leverage contingencies. And it helps them to remain adaptive in uncertain environments. This is especially the case during early venture stages. The role it plays as a responsive and flexible tool supports the basic elements of effectuation theory. Its use is closely linked to effectual behaviour, especially when it comes to Means Orientation and Leveraging Contingencies. Although some causal tendencies arise in organised stages such as scaling, the overall results confirm AI's value as a modern antecedent to effective logic, providing fresh insights into the developing relationship between entrepreneurship and rising technology.

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APPENDIX I – INTERVIEW INVITATION MAIL

Uitnodiging voor interview afstudeeronderzoek Universiteit van Twente

Goedemiddag X,

Mijn naam is Zoubair Yassine en ik ben Masterstudent Bedrijfskunde aan de Universiteit van Twente. Voor mijn afstudeerscriptie doe ik onderzoek naar hoe MKB-ondernemers omgaan met onverwachte of onzekere situaties die strategische beslissingen vereisen. Aangezien vrijwel iedere ondernemer met zulke momenten te maken krijgt, richt mijn onderzoek zich op de wijze waarop deze besluitvorming tot stand komt, én in hoeverre generatieve AI-tools, zoals ChatGPT of andere vergelijkbare platformen, daarbij vandaag de dag een rol (kunnen) spelen. Gezien het profiel van uw onderneming sluit dit goed aan bij mijn onderzoeksdoel.

Voor mijn onderzoek ben ik specifiek op zoek naar oprichters van MKB-ondernemingen in de regio Twente, actief in (online) marketing en die minimaal twee jaar bestaan. Daarbij richt ik me op de vraag of zij zelf generatieve AI, zoals ChatGPT of andere vergelijkbare platformen, als tool gebruiken in hun besluitvorming bij onverwachte of onzekere situaties, en zo ja, op welke manier. En als dat niet het geval is, wat hun perspectief is op het gebruik ervan binnen dat soort besluitvormingsprocessen.

Aangezien X actief is in het ondersteunen van andere MKB-ondernemingen met marketingdiensten en online zichtbaarheid, verwacht ik dat uw inzichten als oprichter van grote waarde kunnen zijn voor mijn onderzoek. Daarom zou ik u graag als oprichter van X interviewen om uw perspectief en ervaringen te horen. Binnen de Universiteit Twente is er op dit moment veel belangstelling voor praktijkgerichte inzichten op dit vlak. Uw bijdrage helpt mee om een nog onderbelicht thema, besluitvorming onder onzekerheid en de mogelijke rol van generatieve AI daarin beter te begrijpen. Het interview duurt circa 30 à 45 minuten, kan fysiek of digitaal plaatsvinden, en wordt uiteraard volledig anoniem verwerkt. Desgewenst ontvangt u een samenvatting van de uitkomsten.

Zou u hiervoor openstaan? Ik pas me graag flexibel aan uw agenda aan. Uw deelname zou van grote waarde zijn voor mijn onderzoek, en ik kijk ernaar uit om van uw ervaringen te leren. Alvast hartelijk dank voor uw overweging!

Met vriendelijke groet,

Zoubair Yassine
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APPENDIX II- INTERVIEW QUESTIONS

1. Conceptfase

Kunt u iets vertellen over hoe u de beginfase van uw onderneming heeft ervaren, dus de periode waarin u uw idee ontwikkelde en de eerste stappen zette richting het starten van **X** ?

- **Vraag 1:** Toen u **X** opstartte, in hoeverre heeft u vertrouwd op uw eigen kennis, eerdere ervaringen, bestaande netwerken of persoonlijke (niet-financiële) middelen?
- **Vraag 2:** Kunt u een specifiek voorbeeld geven van een onverwachte gebeurtenis tijdens de opstart van u onderneming, zoals een klant die onverwacht afhaakte of plotselinge verschuivingen in de vraag naar bepaalde diensten, die u dwong uw aanpak bij het identificeren van zakelijke kansen te heroverwegen?
- **Vraag 3:** In hoeverre heeft u in deze fase gewerkt met vooraf opgestelde doelen of voorspellingen bij het vinden van kansen? Hoe strikt hield u zich aan deze plannen?
- **Vraag 4:** Heeft u tijdens de conceptfase gebruikgemaakt van generatieve AI-tools, zoals ChatGPT of soortgelijke platforms?
  - Zo **ja**: Op welke manieren heeft het gebruik ervan uw aanpak beïnvloed bij het omgaan met onverwachte of onzekere situaties deze vroege fase?
  - Heeft u bijvoorbeeld generatieve AI tijdens de conceptfase gebruikt als adviserende tool om snel te kunnen schakelen bij onverwachte situaties in het startproces? Of juist om doelen te stellen en vooruit te plannen?
  - Zo **nee***:* Wat waren voor u de redenen om in deze fase geen gebruik te maken van generatieve AI?
  - Stel dat u vandaag opnieuw een onderneming zou opstarten en zich in de conceptfase bevindt, met toegang tot generatieve AI-tools zoals ChatGPT, hoe zou u deze dan gebruiken om een nieuw ondernemingsidee te ontwikkelen? Wat voor vragen of opdrachten (‘prompts’) zou u aan zo’n tool geven om richting te geven aan dat idee?

2. Opschaalfase

Kunt u kort iets vertellen over hoe u de groeifase van **X** heeft ervaren, dus de periode waarin uw onderneming uitbreidde, het klantportfolio groeide en u bijvoorbeeld teamleden toevoegde?

- **Vraag 1:** Toen uw onderneming groeide en u geconfronteerd werd met steeds meer operationele uitdagingen:
  In hoeverre heeft u daarbij kunnen leunen op eerdere kennis, ervaringen, netwerken of persoonlijke (niet-financiële) middelen?
- **Vraag 2:** Kunt u een concreet voorbeeld geven van een onverwachte of onzekere situatie tijdens het opschalen van **X,** zoals bijvoorbeeld het verliezen van een grote klant of partner in een cruciale fase of een onverwachte toename in opdrachten waarvoor u intern nog niet volledig was ingericht, waardoor u uw opschaalstrategie moest heroverwegen?
- **Vraag 3:** In hoeverre werkte u in deze fase met vooraf opgestelde doelen of voorspellingen? Hoe strikt hield u zich aan deze plannen?
- **Vraag 4:** Heeft u tijdens de opschaalfase gebruikgemaakt van generatieve AI-tools, zoals ChatGPT of soortgelijke platforms?
  - Zo **ja**: Op welke manieren heeft het gebruik ervan uw aanpak beïnvloed bij het aanpassen aan onverwachte veranderingen in deze groeifase?
  - Heeft u bijvoorbeeld generatieve AI tijdens de opschaalfase gebruikt als adviserende tool om snel te kunnen schakelen bij onverwachte situaties in het opschalen? Of juist om doelen te stellen en vooruit te plannen?
  - Zo **nee***:* Wat waren voor u de redenen om in deze fase geen gebruik te maken van generatieve AI?
  - Stel dat uw onderneming nu opnieuw een sterke groeifase doormaakt, bijvoorbeeld door toename in klanten of uitbreiding naar nieuwe markten: Hoe zou u generatieve AI dan inzetten om dat proces te ondersteunen? Wat voor opdrachten (‘prompts’) zou u zo’n tool geven om richting te geven aan beslissingen?

3. Volwassenheidsfase

Hoe zou u in het kort uw ervaring omschrijven in de volwassenheidsfase van **X,** de periode waarin uw onderneming stabieler werd en u zich moest richten op het behouden of versterken van uw marktpositie?

- **Vraag 1:** In de volwassenheidsfase, toen uw bedrijf zich stabiliseerde en geconfronteerd werd met structurele marktveranderingen en toenemende concurrentiedruk, in hoeverre heeft u vertrouwd op uw eerdere kennis, ervaringen, netwerken en persoonlijke (niet-financiële) middelen om concurrerend te blijven, te innoveren en uw marktpositie te versterken?
- **Vraag 2:** Kunt u een voorbeeld geven van een onverwachte of onzekere situatie in deze fase, zoals het verliezen van een belangrijke klant, negatieve feedback die invloed had op uw reputatie, of plotselinge veranderingen in de markt, waardoor u uw strategie moest aanpassen om uw marketingbureau goed draaiende te houden?
- **Vraag 3:** In hoeverre heeft u gebruikgemaakt van gestructureerd plannen of voorspellende modellen in uw besluitvorming tijdens de volwassenheidsfase?
- **Vraag 4:** Heeft u tijdens de volwassenheidsfase gebruikgemaakt van generatieve AI-tools, zoals ChatGPT of soortgelijke platforms?
    - Zo **ja**: Op welke manieren heeft het gebruik ervan uw aanpak beïnvloed bij het aanpassen aan onverwachte veranderingen in de volwassenheidsfase?
    - Heeft u bijvoorbeeld generatieve AI tijdens de volwassenheidsfase gebruikt als adviserende tool om snel te kunnen schakelen bij onverwachte situaties in de volwassenheidsfase? Of juist om doelen te stellen en vooruit te
    - Zo **nee***:* Wat waren voor u de redenen om in deze fase geen gebruik te maken van generatieve AI?
    - Stel dat **X** opnieuw geconfronteerd zou worden met een significante uitdaging of groeikans, bijvoorbeeld door technologische verschuivingen of het betreden van een nieuwe markt, en u zou nu toegang hebben tot generatieve AI-tools zoals ChatGPT: hoe zou u deze dan inzetten om dat proces te ondersteunen? Wat voor vragen of opdrachten (‘prompts’) zou u aan zo’n tool geven om richting of structuur aan te brengen in uw beslissingen?

APPENDIX III – INTERVIEW CODEBOOK

Effectuation	Causation	Generative AI Influence
M-Means Orientation	G-Goal Orientation	AI enabling Effectuation
L-Leveraging Contingencies	A-Avoiding Surprises	AI enabling Causation
X-Effectual (no subcategory given)	Y-Causal (no subcategory given)	

Effectuation	Causation	Generative AI Influence
M-Means Orientation An entrepreneurial approach where actions are based on the resources and assets currently available to the entrepreneur, rather than on predetermined goals. This orientation can be broken down into three components: - ***Who I am*** refers to the entrepreneur's personal traits (e.g., proactiveness, self-confidence, achievement orientation, openness to experience, willingness to take risks), abilities (e.g., communication skills, leadership, analytical thinking), and interests (e.g., interest in learning new things, working independently). - ***What I know*** refers to the entrepreneur's knowledge, skills, and experience built through education, training, work history or personal experience (e.g., sector expertise, general business knowledge, prior entrepreneurial experience, management experience, industry-related education). - ***Who I know*** refers to the entrepreneur's professional and social network, providing access to resources, information, support and opportunities. This includes contacts such as former colleagues, mentors, investors, friends, or family members. **References**: (Sarasvathy, 2001; Dew et al., 2009; Grégoire & Cherchem, 2020)	**G-Goal Orientation** An entrepreneurial approach where the entrepreneur starts with a specific, clearly defined goal and works towards achieving it in a structured and planned manner. The focus is on setting concrete targets from the beginning, then identifying what is needed to reach them (e.g., funding, people, tools) and creating a step-by-step plan to move forward. Entrepreneurs following this logic are guided by the desired end result and tend to make decisions that keep them on track, avoiding major changes to their original plan unless strictly necessary. **References**: (Sarasvathy, 2001; Wiltbank et al., 2006; Read et al., 2009; Dew et al., 2009)	**AI enabling Effectuation** This refers to the entrepreneur's use of generative AI tools (e.g., ChatGPT) to support an effectual decision-making style. For example using it to flexibly respond to uncertainty, adapt quickly to unforeseen events, and transform surprises into opportunities. Also to assists them in leveraging their available means, who they are, what they know, and whom they know, to act without needing clear predictions, and to make the best use of what is at hand in dynamic environments.

L-Leveraging Contingencies Leveraging Contingencies refers to an entrepreneurial approach where unexpected events, surprises, or changes in the environment are embraced and turned into new opportunities rather than seen as setbacks. Entrepreneurs following this logic stay flexible and adjust their strategies based on emerging situations, using unforeseen developments to strengthen their business instead of strictly sticking to an original plan. For example, when plans suddenly change or new information becomes available, these entrepreneurs are open to shifting direction, testing a new idea, or exploring an alternative route. This approach reflects a mindset that sees uncertainty as a source of opportunity rather than a threat. **References**: (Sarasvathy, 2001; Read et al., 2009; Dew et al., 2009)	**A-Avoiding Surprises** Avoiding Surprises refers to an entrepreneurial approach where surprise is bad, unexpected events are seen as threats, not opportunities. Entrepreneurs following this logic view surprises as obstacles that can disrupt progress and should be avoided at all costs. They aim to reduce uncertainty by planning ahead, making forecasts, and minimizing risk. Instead of adapting to new situations, they try to prevent them from occurring in the first place. For example, when something unpredictable arises, they may delay action, collect more data, or stick to their original plan. This approach reflects a mindset that prioritizes control, predictability, and risk avoidance over flexibility and experimentation. **References**: (Sarasvathy, 2001; Read et al., 2009)	**AI enabling Causation** This refers to the entrepreneur's use of generative AI tools (e.g., ChatGPT) to support a causal decision-making style. This could involve entrepreneurs applying generative AI tools to enhance structured, goal-oriented decision-making to avoid surprises as well.
X-Effectual (no subcategory given) This code captures statements that are indicative of effectual logic but do not clearly fit into the predefined dimensions.	**Y-Causal (no subcategory given)** This code captures statements that are indicative of causal logic but do not clearly fit into the predefined dimensions.	

Table 16: Codebook table used dimensions and definitions

APPENDIX IV – SURVEY 1 (PURELY EFFECTUATION VS CAUSATION)

Naam Onderneming:_____

1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	O O O O O O	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	O O O O O O	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	O O O O O O	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	O O O O O O	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	O O O O O O	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	O O O O O O	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	O O O O O O	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen, ook als die niet pasten binnen het oorspronkelijke plan.	O O O O O O	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	O O O O O O	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	O O O O O O	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	O O O O O O	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	O O O O O O	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden zelfs als die niet in lijn waren met ons oorspronkelijke plan.	O O O O O O	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	O O O O O O	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Table 17: First survey effectuation vs causation

APPENDIX V – SURVEY 2 GENERATIVE AI USAGE PER PHASE

Instructie: Lees beide uitspraken per rij. Zet een kruisje in één van de zes bolletjes om aan te geven naar welke uitspraak uw gebruik van AI in die fase het meest neigt. Heeft u in deze fase géén Generative AI gebruikt, maar zou u dat wél doen als u opnieuw in die fase zou belanden? Vul dan alsnog een van de bolletjes in die het beste bij uw voorkeur past. Alleen als u AI toen niet gebruikte en ook nu niet zou willen gebruiken, kiest u het vierkantje in het midden die staat voor 'Beiden niet van toepassing'.

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○ ○ ○ □ ○ ○ ○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○ ○ ○ □ ○ ○ ○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○ ○ ○ □ ○ ○ ○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○ ○ ○ □ ○ ○ ○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○ ○ ○ □ ○ ○ ○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○ ○ ○ □ ○ ○ ○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Table 18: Second survey AI usage for effectual or causal purposes

For the complete appendix with additional information per venture, the author can be contacted.

APPENDICES MICRO ANALYSIS PER VENTURE

MICRO ANALYSIS VENTURE A

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises	2	1	4	2	
AI enabling Causation	4	3	3		1
AI enabling Effectuation		5	5	1	
G-Goal Orientation	13	5	4	7	1
L-Leveraging Contingencies	3	8	7	2	9
M-What I know	4	4	2		
M-Who I am	2	1			1
M-Who I know	8	1	2		
Means Orientation (Total)	14	5	4		1
X-Effectual (no subcategory given)	1				
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○ ○ ○ □ ○ ○ ○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○ ○ ○ □ ○ ○ ○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○ ○ ○ ■ ○ ○ ○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○ ○ ○ ■ ○ ○ ○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○ ○ ○ □ ○ ○ ○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○ ○ ○ □ ○ ○ ○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○ ○ ○ ○ ○ ○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	○ ○ ○ ○ ○ ○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	○ ○ ○ ○ ○ ○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○ ○ ○ ○ ○ ○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○ ○ ○ ○ ○ ○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○ ○ ○ ○ ○ ○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	○ ○ ○ ○ ○ ○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○ ○ ○ ○ ○ ○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	○ ○ ○ ○ ○ ○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○ ○ ○ ○ ○ ○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	○ ○ ○ ○ ○ ○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○ ○ ○ ○ ○ ○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○ ○ ○ ○ ○ ○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○ ○ ○ ○ ○ ○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Causal dominant, strong Goal Orientation, AI enabling causation, minor effectual (Who I Know)	Effectual dominant	Effectual AI use	Partly matched – Effectual logic aligns, but AI used causally only. Survey 2 mismatches on AI use.
Scaling	Effectual dominant, Leveraging Contingencies & What I Know, AI enabling effectuation	Effectual dominant	No AI use	Human logic consistent. AI use contradicts: survey says no AI, interview shows both (more effectual).
Maturity	Hybrid, Leveraging Contingencies & Goal Orientation, AI enabling both	Effectual dominant	Causal AI use	Logic aligns. AI use partly mismatched – survey shows only causal, interview shows both types.

Table 19: Triangulation table venture A

MICRO ANALYSIS VENTURE B

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises	1	2	1	1	
AI enabling Causation	3	1	3		
AI enabling Effectuation		11	3		
G-Goal Orientation	16	11	2	6	
L-Leveraging Contingencies	14	15	1		7
M-What I know	5	14	1		6
M-Who I am	3	6			
M-Who I know	3	4	1		1
Means Orientation (Total)	11	24	2		7
X-Effectual (no subcategory given)	2				
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ □ ○●○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○○○ □ ○○●	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○●○ □ ○○○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○○ ■ ○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○○● □ ○○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○●○○○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	○●○○○○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	●○○○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○●○○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○○●○○○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	●○○○○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	○●○○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	●○○○○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	●○○○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○●○○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	●○○○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	●○○○○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○●○○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○●○○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Slight causal dominance. Strong Goal Orientation (16x) and AI enabling causation (3x); also high Leveraging Contingencies (14x) and Means Orientation (11x).	Effectual dominant	Causal AI use	Mismatch – Interview and Survey 2 both show causal AI use, but Survey 1 points strongly to effectuation
Scaling	Strongly effectual. Means Orientation (24x), Leveraging Contingencies (15x), some Goal Orientation (11x). AI mainly for effectuation (11x), minor causation (1x).	Effectual dominant	Effectual AI use	Aligned – All sources confirm effectual logic and AI use in support of effectual action
Maturity	Hypothetical. Low frequencies in both styles. Slightly balanced: Goal Orientation (2x), Means (2x), LC (1x), AI use equal (3x/3x).	Effectual dominant	Mixed AI use	Aligned – Hybrid logic and AI use confirmed across interview and Survey 2; Survey 1 leans slightly effectual

Table 20: Triangulation table venture B

MICRO ANALYSIS VENTURE C

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises	4	3			
AI enabling Causation		6	1		
AI enabling Effectuation	2	3	1		
G-Goal Orientation	3	21	1	7	
L-Leveraging Contingencies	11	10	1		5
M-What I know	5	10			1
M-Who I am	4	8			
M-Who I know	6	3			
Means Orientation (Total)	15	20			1
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○●○ □ ○○○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○○● □ ○○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○●○ □ ○○○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○● □ ○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	●○○ □ ○○○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○●○ □ ○○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	●○○○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	●○○○○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	●○○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○●○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	●○○○○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	●○○○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	○●○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○○●○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	○●○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○●○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	●○○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○○●○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○●○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	●○○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Effectual dominant. Strong Means Orientation (15x), Leveraging Contingencies (11x), Who I Know (6x), and What I Know (5x).	Effectual dominant	Effectual AI use	Fully aligned – effectual logic and effectual AI use across sources.
Scaling	Mixed logic with causal leaning. Goal Orientation (21x), Means Orientation (20x), What I Know (10x), LC (10x).	Effectual dominant	Effectual AI use	Partially aligned – interview shows mixed logic; surveys support effectuation and AI effectual use.
Maturity	Hypothetical. Light and balanced: Avoiding Surprises (1x), Goal Orientation (1x), LC (1x), What I Know (1x).	Effectual dominant	Effectual AI use	Aligned – low signal volume but all data support effectual logic and AI use.

Table 21: Triangulation table venture C

MICRO ANALYSIS VENTURE D

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises			1	1	
AI enabling Causation			3		
AI enabling Effectuation	3	14	14		
G-Goal Orientation		5	6	2	
L-Leveraging Contingencies	20	13	14		19
M-What I know	10	6	12		12
M-Who I am	6	7	1		
M-Who I know	9	6	4		
Means Orientation (Total)	22	19	17		12
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ □ ●○○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○●○ □ ○○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○○● □ ○○○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○○ □ ●○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	●○○ □ ○○○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○●○ □ ○○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	●○○○○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	●○○○○○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	●○○○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	●○○○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○●○○○○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○●○○○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	○●○○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○●○○○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	●○○○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	●○○○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	●○○○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○●○○○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	●○○○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	●○○○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Ideation	Strongly effectual. Dominant in Means (22x) and LC (20x), plus What I Know (10x), Who I Know (9x), Who I Am (6x). AI used 3x for LC.	Effectual dominant	Mixed AI use	Fully aligned — Effectual logic; AI used for both planning and seizing chances.
Scaling	Effectual dominant with slight causal signs. LC (13x), Means (19x), What I Know (6x), Who I Am (7x), Goal Orientation (5x). AI used 14x for means.	Effectual dominant	Mixed AI use	Consistent — Effectual core with minor causal AI signals confirmed.
Maturity	Effectual. LC (14x), Means (17x), What I Know (12x), some Goal Orientation (6x). AI used 14x for means and LC; 2x for planning.	Effectual dominant	Causal AI use	Consistent — Effectual logic and AI use; minor causal planning overlap.

Table 22: Triangulation table venture D

MICRO ANALYSIS VENTURE E

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises	5	5		1	
AI enabling Causation		2	2		
AI enabling Effectuation			1		
G-Goal Orientation		5	4	3	
L-Leveraging Contingencies	5	9	3		1
M-What I know	7	10	3		
M-Who I am	11	6	3		
M-Who I know	7	4	1		
Means Orientation (Total)	25	19	7		
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ □ ●○○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○●○ □ ○○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○●○ □ ○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○○ □ ○○●	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○○● □ ○○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○●○○○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	○●○○○○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	○●○○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○●○○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○●○○○○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○●○○○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	○●○○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	●○○○○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	●○○○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○○●○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	○●○○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○●○○○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	●○○○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	●○○○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Strongly effectual. Dominant in Means Orientation (25x), especially Who I am (11x), What I know (7x), and Who I know (7x). LC scored 5x. No AI used.	Effectual dominant	Mixed AI use	Fully aligned — Strong effectual profile confirmed, early AI use aligns with both causal and effectual intents.
Scaling	Hybrid profile. Means (19x), LC (9x), What I know (10x), and Goal Orientation (5x). AI used 3x (1x LC, 1x Goal-setting, 1x Avoiding Surprises).	Effectual dominant	Mixed AI use	Consistent — Effectual base with clear causal additions; AI use supports both.
Maturity	Slight causal shift. Avoiding Surprises (5x), Goal Orientation (4x), Means Orientation drops (7x). AI use (1x LC, 1x Goal-setting, 1x Avoiding Surprises).	Effectual dominant	Causal AI use	Aligned.

Table 23:Triangulation table venture E

MICRO ANALYSIS VENTURE F

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises	3	4			
AI enabling Causation	5	6			
AI enabling Effectuation		2			
G-Goal Orientation	9	14		11	
L-Leveraging Contingencies	10	6			1
M-What I know	11	5			1
M-Who I am	8	4			
M-Who I know	8	4			
Means Orientation (Total)	27	13			1
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ ■ ○○○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○○○ ■ ○○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○○● □ ○○○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○● □ ○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○○ □ ●○○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○○○○●○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	○○○●○○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	○○●○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○○●○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○○●○○○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○○●○○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	○○●○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○●○○○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	○●○○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○●○○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	○●○○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○●○○○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○○●○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○●○○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Strongly effectual. Means Orientation (27x), esp. What I know (11x), Who I am (8x), Who I know (8x), LC (10x). Some causal presence via Goal Orientation (9x) and AI enabling Causation (5x). AI also used once for LC.	Effectual dominant	No AI used	Aligned — Strong effectual logic; AI absent in practice, though minor causal tendency seen in interview data.
Scaling	More balanced profile. Goal Orientation (14x), Means Orientation (13x), LC (6x), Avoiding Surprises (4x). AI used 11x to support Goal Orientation (causal), and once each for LC and What I know (effectual).	Effectual dominant	Effectual AI use	Aligned — Effectual style confirmed; interview shows added causal AI use, survey shows pure effectual use.
Maturity	No interview codes recorded. Phase not yet entered operationally.	Effectual dominant	Hypothetical AI use only: expected for causal purposes	Consistent — No current maturity phase activity; future causal AI use anticipated in line with expectation.

Table 24:Triangulation table venture F

MICRO ANALYSIS VENTURE G

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises		2	2	1	
AI enabling Causation	2	2	3		
AI enabling Effectuation	1	2	3		
G-Goal Orientation	4	4	3	6	
L-Leveraging Contingencies	2	5	1		2
M-What I know	6	1	4		3
M-Who I am	2	1	1		
M-Who I know		2	3		1
Means Orientation (Total)	8	4	8		4
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ ■ ○○○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○○○ ■ ○○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○○○ ■ ○○○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○○ ■ ○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○○ □ ○○○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○○○ □ ○○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○○○●○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	○○○○○●	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	○○○●○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○○●○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○○○○●○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○○○●○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	○○●○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○●○○○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	●○○○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○○○●○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	○○●○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○●○○○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○●○○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○●○○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Ideation	Effectual dominant. Means (8x), esp. What I know (6x), with LC (2x). Some Goal Orientation (4x). AI used for both LC (1x) and goal-setting (2x).	Causal focus with adaptive traits.	No AI used	Partially aligned — effectual logic matches, AI use not reflected in survey.
Scaling	Hybrid profile. Goal Orientation (4x), Means (4x), LC (2x), Avoiding Surprises (2x). AI used for both causal (2x) and effectual (2x) aims.	Causal focus with adaptive traits.	Effectual AI use	Partially consistent — decision style aligns, but AI use underreported.
Maturity	Hypothetical. Means (8x), esp. What I know (4x), Goal Orientation (3x), LC (1x). Dual AI support expected.(3x), Avoiding Surprises (2x). AI expected to support both causation and effectuation.	Causal focus with adaptive traits.	Hypothetical Mixed AI use	Consistent — anticipated dual approach matches across sources..

Table 25: Triangulation table venture G

MICRO ANALYSIS VENTURE H

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises			1		
AI enabling Causation					
AI enabling Effectuation					
G-Goal Orientation	1	6	1		
L-Leveraging Contingencies	2	1	2		
M-What I know	5	3	2		
M-Who I am	1		1		
M-Who I know	3	7	3		
Means Orientation (Total)	9	10	6		
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○ ◉ ○ □ ○ ○ ○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○ ◉ ○ □ ○ ○ ○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○ ○ ○ ■ ○ ○ ○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○ ○ ○ ■ ○ ○ ○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○ ○ ○ ■ ○ ○ ○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○ ◉ ○ □ ○ ○ ○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	◉ ○ ○ ○ ○ ○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	◉ ○ ○ ○ ○ ○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	◉ ○ ○ ○ ○ ○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	◉ ○ ○ ○ ○ ○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	◉ ○ ○ ○ ○ ○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	◉ ○ ○ ○ ○ ○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	◉ ○ ○ ○ ○ ○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○ ○ ○ ◉ ○ ○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	○ ◉ ○ ○ ○ ○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○ ◉ ○ ○ ○ ○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	○ ◉ ○ ○ ○ ○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	◉ ○ ○ ○ ○ ○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	◉ ○ ○ ○ ○ ○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	◉ ○ ○ ○ ○ ○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Strongly effectual: Means-driven (9x), esp. What I Know & Who I Know. No AI used.	Effectual dominant	Effectual AI use	Fully aligned — effectual mindset and AI intent match
Scaling	Still effectual-leaning: Means (10x), rise in Goal Orientation (6x). No AI used or expected.	Effectual dominant	AI not used or intended	Consistent — strategy based on human capital, not AI
Maturity	Effectual focus continues: Means (6x), minor causal signs. No AI used.	Effectual dominant	AI only for LC (Effectuation)	Fully consistent — adaptive logic with limited causal anticipation

Table 26: Triangulation table venture H

MICRO ANALYSIS VENTURE I

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises	2	2			
AI enabling Causation	1				
AI enabling Effectuation	1				
G-Goal Orientation	5	5		1	
L-Leveraging Contingencies	4	2			1
M-What I know	2	2			
M-Who I am	4	4			
M-Who I know	4	1			
Means Orientation (Total)	10	7			
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ ■ ○○○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○○○ ■ ○○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○● ○ □ ○○○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○● □ ○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○● □ ○○○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○○○ □ ●○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○○●○○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	○○○○○●	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	○●○○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○●○○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○○○○●○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○○○●○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	○○●○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○●○○○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	○●○○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○○●○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	○○●○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○○○●○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○○○●○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○●○○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Strongly effectual. Dominant Means (10x), esp. Who I Know & What I Know. Some Goal Orientation (5x), LC (4x). AI used once for GO and once for LC.	Effectual dominant	No AI used or intended.	Aligned logic, minor AI mismatch — survey shows no use despite intent.
Scaling	Effectual-leaning. Means (7x), esp. Who I Am. Goal Orientation (5x), LC/What I Know (2x). AI for GO & LC.	Effectual dominant	Effectual AI use	Mostly consistent — AI intent in interview, underreported in survey.
Maturity	No interview data.	Effectual dominant	Mixed AI used	Consistent — dual AI use fits adaptive/cautious maturity logic.

Table 27: Triangulation table venture I

MICRO ANALYSIS VENTURE J

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises		4			
AI enabling Causation			1		
AI enabling Effectuation	3	10	3		
G-Goal Orientation	3	4	1	1	
L-Leveraging Contingencies	7	11	3		14
M-What I know	6	8			2
M-Who I am					
M-Who I know	4	3			
Means Orientation (Total)	10	11			2
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ □ ○●○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○●○ □ ○○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○●○ □ ○○○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○○ ■ ○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○●○○○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	○○●○○○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	●○○○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○●○○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○●○○○○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○●○○○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	○●○○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	●○○○○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	○●○○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○●○○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	○○○●○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○●○○○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○○●○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○○●○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Strongly effectual. High Means Orientation (10x), especially What I Know (6x). Leveraging Contingencies (7x) also high. Minimal AI use, only to support effectuation.	Effectual dominant	Dual AI use for both GO (causal) and LC (effectual)	Partially consistent — interview shows effectual mindset, but Survey 2 indicates dual (effectual + causal) AI use
Scaling	Still effectual. Means Orientation (11x) led by What I Know (8x). LC peaked at 11x. AI use only for effectual purposes (Means, LC).	Effectual dominant	Effectual AI use (Means)	Mostly consistent — effectual logic and AI use aligned, though Survey 2 underreports LC-related AI use
Maturity	No active phase. Hypothetical: Means and LC remain; AI only mentioned for effectual use.	Effectual dominant	AI hypothetically used only for causal aims	Inconsistent — interview claims effectual-only, Survey 2 shows full causal AI intent.

Table 28: Triangulation table venture J

MICRO ANALYSIS VENTURE K

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises		1			
AI enabling Causation		2	1		
AI enabling Effectuation	1	3			
G-Goal Orientation	1	10	1	3	1
L-Leveraging Contingencies	3	3			1
M-What I know	3	6			2
M-Who I am					
M-Who I know	2	5			
Means Orientation (Total)	5	11			2
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○●□○○○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○○●□○○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○○●□○○○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○●□○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○○□●○○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○○●□○○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○●○○○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	○●○○○○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	○●○○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○●○○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○●○○○○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○●○○○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	●○○○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○●○○○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	○●○○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○○●○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	○○●○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○●○○○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○●○○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○○●○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Strongly effectual. High Means Orientation (10x), especially What I Know (6x). Leveraging Contingencies (7x) also high. Minimal AI use, only to support effectuation.	Effectual dominant	Effectual AI use	Fully consistent — strong effectual alignment across interview and surveys.
Scaling	Still effectual. Means Orientation (11x) led by What I Know (8x). LC peaked at 11x. AI use only for effectual purposes (Means, LC).	Effectual dominant	Effectual AI use	Fully consistent — AI use and logic in survey matches effectual interview strategy.
Maturity	No active phase. Hypothetical: Means and LC remain; AI only mentioned for effectual use.	Effectual dominant	Mixed AI use —Goal Orientation (causal) and Leveraging Contingencies (effectual).	Partially consistent — interview shows effectual focus with minor causal traits; survey confirms dual AI intent only in this hypothetical phase.

Table 29: Triangulation table venture K

MICRO ANALYSIS VENTURE L

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises		2			
AI enabling Causation	2		2		
AI enabling Effectuation	2	4	1		
G-Goal Orientation	4	4	2	4	
L-Leveraging Contingencies	6	2	1		4
M-What I know	3	5			3
M-Who I am	2				
M-Who I know	1	2			
Means Orientation (Total)	6	7			3
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ □ ○●○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○○○ □ ●○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○○ □ ○●○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○○○ □ ●○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○○○●○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	○○○○●○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	○○○●○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○○○○●○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○○○○●○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○○○○●○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	○○○●○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○○○●○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	○○○○●○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○○○●○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	○○○○●○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○●○○○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○○○●○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○○●○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Effectual: strong Means (6x), esp. What I Know (3x), Who I Know (2x); Leveraging Contingencies (6x); some Goal Orientation (4x). Dual AI use.	Causal dominant	Mixed AI use Goal Orientation (causal) and Leveraging Contingencies (effectual)	Partially consistent — interview shows effectual logic, but surveys reflect stronger causal/dual AI intent.
Scaling	Still effectual: Means (7x, mostly What I Know), moderate Goal Orientation (4x), some Contingencies + Avoiding Surprises (2x each).	Causal dominant	Mixed AI use for causal (GO) and effectual (LC) purposes	Partially consistent — interview more balanced; surveys strongly causation-driven.
Maturity	Hypothetical: balanced Means (2x) and Goal Orientation (2x). AI expected for both causal and effectual purposes.	Causal dominant	Mixed AI use for causal (GO) and effectual (LC) purposes	Partially consistent — interview shows effectual logic, survey confirms dual-use AI intent.

Table 30: Triangulation table venture L

MICRO ANALYSIS VENTURE M

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises	1	1			
AI enabling Causation	3				1
AI enabling Effectuation	4	1		1	
G-Goal Orientation	5	4		3	1
L-Leveraging Contingencies	6	2		1	4
M-What I know	4	1			1
M-Who I am	2				
M-Who I know	6		1		
Means Orientation (Total)	12	1	1		1
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ □ ○●○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○○○ ■ ○○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○○ ■ ○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○○○ □ ●○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	●○○○○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	●○○○○○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	●○○○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○●○○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	○●○○○○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○●○○○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	●○○○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	●○○○○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	○●○○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	●○○○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	●○○○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○●○○○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○●○○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○○●○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Strongly effectual: high Means (12x), esp. Who I Know (6x) + What I Know (4x); Contingencies (6x), some GO (5x). Dual AI use (effectual 4x, causal 3x).	Fully Effectual	Fully causal — AI only used for Goal Orientation	Partially consistent — effectual logic confirmed, but AI use in survey fully causal
Scaling	Mixed but leaning effectual: low Means (1x), moderate GO (4x), some Contingencies (2x) + Avoiding Surprises (1x). AI for GO (3x) + Contingencies (4x).	Fully Effectual	Fully causal — AI only used for Goal Orientation	Inconsistent — interviews show dual AI use, survey confirms only causal AI
Maturity	Hypothetical: low Means (1x), some GO (2x) + Contingencies (1x). AI expected for both causal and effectual use.	Fully Effectual	Fully causal — AI for Goal Orientation and Avoiding Surprises	Partially consistent — effectual mindset sustained, but survey shows only causal AI intent

Table 31: Triangulation table venture M

MICRO ANALYSIS VENTURE N

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises	1			1	
AI enabling Causation	2	2	2		
AI enabling Effectuation	2	2			
G-Goal Orientation	4	5	2	5	
L-Leveraging Contingencies	1	2			2
M-What I know	5	1			1
M-Who I am					
M-Who I know	4	3			1
Means Orientation (Total)	9	4			2
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ □ ●○○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○○○ □ ●○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○○○ □ ●○○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○● □ ○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○○ ■ ○○○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○○○ ■ ○○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	●○○○○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	●○○○○○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	●○○○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	○●○○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	●○○○○○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	●○○○○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	●○○○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○○●○○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	○○●○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	○●○○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	○●○○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	○○○●○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	○●○○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○○●○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Strongly effectual: high Means (9x), esp. What I Know (5x), Who I Know (4x); some GO (4x); dual AI use (2x causal, 2x effectual).	Fully Effectual	Fully Causal	Partially consistent — effectual logic confirmed, but AI use in survey fully causal
Scaling	Mixed: GO (5x) dominant, some Means (4x), Contingencies (2x); AI used for both GO (5x) and Contingencies (2x).	Fully Effectual	Mixed AI use for causal (GO) and effectual (LC) purposes	Largely consistent — dual AI use and balanced logic confirmed across interview and both surveys.
Maturity	Hypothetical: low Means (1x), some GO (2x), Contingencies (1x); AI expected for both styles.	Fully Effectual	No AI intent	Partially consistent — effectual reasoning sustained, but survey indicates no AI involvement despite interview expectation.

Table 32: Triangulation table venture N

MICRO ANALYSIS VENTURE O

	1 - Ideation Phase	2- Scaling Phase	3 - Maturity Phase	AI enabling Causation	AI enabling Effectuation
A-Avoiding Surprises			1		
AI enabling Causation		1			
AI enabling Effectuation					
G-Goal Orientation		4	4	1	
L-Leveraging Contingencies	3		1		
M-What I know	2				
M-Who I am	1				
M-Who I know	3	3	1		
Means Orientation (Total)	6	3	1		
X-Effectual (no subcategory given)					
Y-Causal (no subcategory given)					

Fase	Effectuation		Causation
Beginfase	1. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de beginfase.	○○○ □ ○●○	Ik gebruikte Generative AI om specifieke doelen of plannen stap voor stap uit te voeren.
Beginfase	2. Generative AI hielp mij om onverwachte kansen en situaties goed te benutten.	○○● □ ○○○	Ik gebruikte Generative AI juist om verrassingen of onvoorspelbaarheid te vermijden.
Opschaalfase	3. Ik gebruikte Generative AI om mijn eigen kennis, ervaring of netwerk beter te benutten in de groeifase.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om vooraf vastgestelde groeidoelen te behalen.
Opschaalfase	4. AI hielp mij om flexibel in te spelen op onverwachte kansen.	○○○ ■ ○○○	Ik gebruikte Generative AI juist om verrassingen en risico's te voorkomen.
Volwassenheidsfase	5. Ik gebruikte Generative AI om mijn opgebouwde ervaring en bestaande contacten beter in te zetten in de volwassen fase.	○○○ □ ○●○	Ik gebruikte Generative AI vooral om strategische doelen en plannen uit te voeren.
Volwassenheidsfase	6. Generative AI hielp mij om soepel om te gaan met onverwachte veranderingen.	○●○ □ ○○○	Ik gebruikte Generative AI vooral om controle te houden en verrassingen te vermijden.

Effectuation		Causation
1. Onze onderneming werd vormgegeven op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	●○○○○	Onze onderneming werd vormgegeven op basis van vooraf vastgestelde ondernemingsdoelen.
2. Het ondernemingsdoel van onze onderneming was in het begin nog vaag en open geformuleerd.	○●○○○	Het ondernemingsdoel van onze onderneming was vanaf het begin helder en duidelijk geformuleerd.
3. De middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al in huis hadden, vormden het vertrekpunt voor onze onderneming.	●○○○○	De vooraf bepaalde ondernemingsdoelen vormden het vertrekpunt voor onze onderneming.
4. De onderneming ontwikkelde zich richting een doel op basis van de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we tot onze beschikking hadden.	●○○○○	De benodigde middelen (zoals beschikbare kennis, vaardigheden en netwerken) werden bepaald op basis van de vooraf gestelde ondernemingsdoelen.
5. We zijn gestart met de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die we al hadden, en niet met een strak omschreven ondernemingsdoel.	●○○○○	We zijn gestart vanuit een duidelijk geformuleerd ondernemingsdoel.
6. De invulling van onze onderneming was voornamelijk gebaseerd op de middelen (zoals beschikbare kennis, vaardigheden en netwerken) die al beschikbaar waren.	○●○○○	De invulling van onze onderneming was voornamelijk gebaseerd op de gestelde ondernemingsdoelen.
7. De beschikbare middelen (zoals beschikbare kennis, vaardigheden en netwerken) hadden een grote invloed op de manier waarop onze onderneming werd ingericht.	●○○○○	De vooraf bepaalde ondernemingsdoelen hadden een grote invloed op de manier waarop onze onderneming werd ingericht.
8. We pasten onze aanpak regelmatig aan wanneer we onverwachte inzichten of resultaten tegenkwamen – ook als die niet pasten binnen het oorspronkelijke plan.	○○●○○	We namen alleen onverwachte inzichten mee als ons oorspronkelijke doel dreigde in gevaar te komen.
9. Ons proces was flexibel genoeg om tussentijds aangepast te worden op basis van nieuwe inzichten.	●○○○○	Ons proces was volledig gericht op het behalen van het vooraf bepaalde ondernemingsdoel zonder vertraging.
10. Nieuwe inzichten tijdens het werk hebben ervoor gezorgd dat we onze doelen bijstelden of heroverwogen.	●○○○○	Nieuwe inzichten hebben onze ondernemingsdoelen niet veranderd.
11. We maakten plannen in kleine stappen tijdens de uitvoering van ons project.	●○○○○	De planning werd grotendeels helemaal aan het begin opgesteld.
12. Ook als het leidde tot vertraging, grepen we kansen aan zodra ze zich voordeden.	●○○○○	We richtten ons er eerst op om het oorspronkelijke ondernemingsdoel te behalen zonder vertraging.
13. We pasten onze werkwijze aan wanneer zich onverwachte kansen voordeden — zelfs als die niet in lijn waren met ons oorspronkelijke plan.	●○○○○	We hielden altijd vast aan het oorspronkelijke ondernemingsdoel.
14. Wanneer er tegenslagen of externe dreigingen waren, probeerden we deze alsnog in ons voordeel te gebruiken.	○●○○○	Door vooraf marktonderzoek te doen, probeerden we tegenslagen en dreigingen juist te voorkomen.

Phase	Interview (Phase-specific)	Survey 1 (General)	Survey 2 (Phase-specific AI use)	Consistency across data
Ideation	Strongly effectual: high Means (6x), esp. What/Who I Know; some Contingencies; minimal causal AI (GO).	Fully Effectual	Mixed AI use for causal (GO) and effectual (LC) purposes	Consistent — effectual logic and dual AI use confirmed in both interview and survey.
Scaling	Mixed: GO (4x) dominant; some Means/Contingencies; AI used only for GO.	Fully Effectual	Causal AI use	Partially consistent — effectual mindset upheld, but AI use was solely causal.
Maturity	Hypothetical: mostly GO; minor Means and Contingencies; AI only for GO.	Fully Effectual	Mixed AI use	Partially consistent — interview shows causal trend, but survey suggests mixed AI usage.

Table 33: Triangulation table venture O

Venture	Founded in	# of Employees	Interview (E vs C)	First Survey (E vs C)	Interview (AI Usage)	Second Survey (AI Usage)
Venture A	2017 – *(8 years)*	80	*Effectual*	*Effectual*	*Equal*	*Effectual & Causal (Equally)*
Venture B	2017 – *(8 years)*	5	*Effectual*	*Effectual*	*Effectual*	*Causal*
Venture C	2008 – *(17 years)*	10	*Effectual*	*Effectual*	*Equal*	*Effectual*
Venture D	2015 – *(10 years)*	10	*Effectual*	*Effectual*	*Effectual*	*Effectual*
Venture E	2007 – *(8 years)*	8	*Effectual*	*Effectual*	*Causal*	*Effectual & Causal (Equally)*
Venture F	2020 – *(5 years)*	10	*Effectual*	*Effectual*	*Causal*	*Effectual & Causal (Equally)*
Venture G	2005 – *(20 years)*	140	*Effectual*	*Causal*	*Equal*	*Effectual & Causal (Equally)*
Venture H	2005 – *(20 years)*	23	*Effectual*	*Effectual*	*Neither*	*Effectual*
Venture I	2020 – *(5 years)*	16	*Effectual*	*Effectual*	*Equal*	*Effectual*
Venture J	2020 – *(5 years)*	2	*Effectual*	*Effectual*	*Effectual*	*Causal*
Venture K	2023 – *(2 years)*	2	*Effectual*	*Effectual*	*Equal*	*Effectual*
Venture L	2019 – *(6 years)*	16	*Effectual*	*Causal*	*Effectual*	*Causal*
Venture M	2018 – *(7 years)*	8	*Effectual*	*Effectual*	*Effectual*	*Causal*
Venture N	2019 – *(6 years)*	3	*Effectual*	*Effectual*	*Causal*	*Causal*
Venture O	2005 – *(20 years)*	15	*Effectual*	*Effectual*	*Causal*	*Causal*

Table 34: Detailed overview orientation per data collection method