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An effectual approach to executing dynamic capabilities under unexpected uncertainty

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ABSTRACT

This study investigates how business-to-business (B2B) firms navigate contexts of unexpected uncertainty. Building on the theories of effectuation and dynamic capabilities, the study develops a model that highlights how effectual decision-making logic is manifested in the activities B2B firms employ to sense and seize new opportunities and threats and transform existing business operations. The qualitative data were collected in two phases (before and after the COVID-19 outbreak) and consisted of 24 interviews with 13 B2B firms. The findings demonstrate a strong reliance on managers' effectual decision-making in situations of unexpected uncertainty and provide a set of key activities that help managers to respond to such situations in a rapid and agile manner.

1. Introduction

Uncertainty is ubiquitous in today's business markets, characterized by rapid technological change and the increasing interconnectedness of economies (Finn, Mysore, & Usher, 2020; Nauck, Pancaldi, Poppensieker, & White, 2021; Teece, Peteratd, & Leih, 2016). In times of unprecedented uncertainty, the winners are first-mover and fast-follower firms that can rapidly adapt to environmental changes (Bughin, Catlin, Hirt, & Willmott, 2018) and turn the negative effects of uncertainty into new business opportunities (Nenonen & Storbacka, 2020). In more academic terms, firms need to be equipped with dynamic capabilities that enable them to reconfigure organizational processes and competences to address the uncertainty caused by the rapidly changing environment (Teece, 2007; Teece, Pisano, & Shuen, 1997). However, despite extensive research on dynamic capabilities over the last two decades, the majority of firms remain slow to respond to new and unexpected market opportunities and threats (Bughin et al., 2018; Silvia, Vinit, & Joakim, 2018). One key reason for slow responses is that firms rely on causal reasoning that promotes careful strategic analysis and planning before formulating responses (Read, Dew, Sarasvathy, Song, & Wiltbank, 2009; Sarasvathy, 2001). In a similar vein, Finn et al. (2020) state that firms are accustomed to following the annual planning cycle in making decisions on strategic movements, budgets, and operational plans. In this study, we propose that a rapid response to *unexpected uncertainty* requires firms to combine dynamic capabilities with effectual reasoning that welcomes market surprises and emphasizes the exploitation of market contingencies in implementing fast-paced and agile changes to business models and operations (Read et al., 2009; Sarasvathy, 2001).

Although uncertainty has always been a central concept in the theory of dynamic capabilities (Teece, 2007; Teece et al., 1997), we perceive that extant theorization provides insufficient means to address *unexpected uncertainty*. To elaborate, the theory emphasizes that uncertainty is caused by an unpredictable business environment (e.g., rapid technological change) and its effects on organizations (Schilke, Hu, & Helfat, 2018; Teece, 2007; Teece et al., 1997). Recent work on dynamic capabilities has specifically drawn upon Knightian uncertainty (Knight, 1921; see also Kano, 2021) and developed the concept of *deep uncertainty* (Teece, 2016; Teece et al., 2016), which refers to "contexts that involve too much complexity to model or forecast any useful level of confidence" (Teece, 2016, p. 204). To navigate deep uncertainty, managers can use their skills and knowledge to make informed conjectures about the possible paths ahead and proactively prepare the organization for change by reconfiguring organizational capabilities and processes (Teece, 2016). Thus, although deep uncertainty cannot be quantified, the underlying assumption is that managers are able to foresee, or at least imagine, the potential changes that may occur. The question is how to prepare for situations of uncertainty that are not recognized until they suddenly occur. Such situations of unexpected uncertainty are evinced by the outbreak of COVID-19, but may stem from any other surprising event in the market environment that requires a quick organizational response.

By using Milliken's (1987) typology of uncertainty, the theory of

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dynamic capabilities guides an organization to prepare itself for *state uncertainty* (i.e., unpredictable organizational environment) and *effect uncertainty* (i.e., unpredictable impacts of environmental changes on a given organization), but it largely ignores *response uncertainty,* which refers to a lack of knowledge of response options and inability to predict the consequences of those responses. The key difference between these three types of uncertainty is that state and effect uncertainty can be addressed by making careful strategic analyses of environmental threats and opportunities and preparing for alternative effects on the organization, while response uncertainty occurs in the context of a need to formulate a quick response to an immediate change in the environment (Milliken, 1987). To address response uncertainty, recent research in the context of COVID-19 outbreak demonstrates the importance of combining dynamic capabilities with organizational agility to ensure rapid adaptation to unanticipated market changes (Bhattacharyya & Thakre, 2021; El Idrissi, El Manzani, Ahl Maatalah, & Lissaneddine, 2022). Since effectual reasoning emphasizes quick and agile responses to market surprises and contingencies (Sarasvathy, 2001), we suggest that combining dynamic capabilities with effectual logic is ideally suited for navigating unexpected uncertainty.

Against this backdrop, the goal of this study is to increase our understanding of how organizations can rapidly adapt themselves when facing situations of unexpected uncertainty. By unexpected uncertainty, we refer to surprising and immediate changes in the market environment that require a firm's rapid response. To reach this goal, we build upon the theories of effectuation and dynamic capabilities and investigate 13 business-to-business (B2B) companies that have undergone adaptations to renew themselves due to events of unexpected uncertainty (e.g., demand-based crisis, competitive or technological disruption, or a global pandemic). The study data consist of 24 interviews with 20 managers representing 13 companies based in Finland and representing a variety of industries.

The findings of this study make three important contributions to the theory. First, this is the first study to integrate the theories of dynamic capabilities and effectuation to provide a better explanation of how companies can adapt to market changes caused by unexpected uncertainty, which complements the dynamic capability literature that has previously focused on navigating deep uncertainty (Teece, 2016; Teece et al., 2016). Second, the study goes beyond theorizing the phenomenon by identifying nine effectual sensing, seizing, and transforming activities that facilitate an organization in formulating prompt and agile responses to situations of unexpected uncertainty. Third, the study uncovers the interlinks and complementarities between effectuation and dynamic capabilities theories that explain why these two constructs are ideal counterparts in responding to unexpected uncertainty. From a managerial point of view, the findings have important implications for how to prepare for different types of uncertainty and how to balance organizational agility and efficiency over time.

The remainder of the article is organized as follows. We begin by reviewing the literature on effectuation and dynamic capabilities and present the study framework. We then describe and justify the methodological approach used in this study. Next, we present the findings and discuss their theoretical and managerial implications. Finally, we discuss the limitations of the study and directions for future research.

2. Literature review

2.1. Effectuation and causation

The theory of effectuation divides managerial decision-making into causation (i.e., causal reasoning) and effectuation (i.e., effectual reasoning) (Sarasvathy, 2001). The characteristics of effectual reasoning can be classified into five categories. First, the future is considered unpredictable; therefore, effectual decision-makers concern themselves with shaping the future by focusing on controllable aspects rather than on building elaborate forecasts of uncontrollable aspects (Maine, Soh, & Dos Santos, 2015;Read et al., 2009; Sarasvathy, 2001). Second, the basis for taking action begins with a set of available means (e.g., knowledge, skills, and willful agents) rather than business goals; the business goals emerge when imagining courses of action with available means (Engel, Kaandorp, & Elfring, 2017; Read et al., 2009; Sarasvathy, 2001, 2008; Sarasvathy & Dew, 2005a). Third, effectuation is focused on affordable loss rather than expected returns (Sarasvathy, 2001). Consequently, an effectual decision-maker avoids investments that risk more than stakeholders can afford to lose and instead prefers small and versatile experiments (Read et al., 2009; Sarasvathy, 2001). Fourth, open collaboration and knowledge-sharing with partners play a central role in effectuation (Sarasvathy, 2001). These relationships shape the trajectory of opportunities and help to reduce uncertainty (Sarasvathy, 2001). Fifth, effectuation welcomes surprises, as unexpected events may provide new opportunities (Read et al., 2009). Indeed, a key strength of the effectual approach stems from exploiting contingencies that can be transformed into business assets through experimentation (Sarasvathy, 2001). In contrast, causation logic perceives the future as a predictable continuation of the past (Sarasvathy, 2001). Causal firms are goal-oriented, focus on expected returns and upside business potential, and minimize the negative effects of unexpected events by predicting, planning, and protecting their assets and resources (Read et al., 2009). Accordingly, causation logic relies on detailed market and competitor analyses and emphasizes formal models in making strategic decisions (Futterer, Schmidt, & Heidenreich, 2017; Read et al., 2009; Sarasvathy, 2001, 2008; Sarasvathy & Dew, 2005a, 2005b).

Research shows that effectuation has a positive effect on the performance of new ventures (Cai, Guo, Fei, & Liu, 2017) and SMEs (Roach, Ryman, & Makani, 2016). Although effectuation has been emphasized in startups and new ventures (Perry, Chandler, & Markova, 2011; Sarasvathy, 2001), recent evidence shows that even established and large-sized B2B firms are adopting effectual reasoning to manage their business operations (e.g., Johansson, Ellonen, & Jantunen, 2012; Mero, Tarkiainen, & Tobon, 2020; Yang & Gabrielsson, 2017). Presumably, the increasing reliance on effectual reasoning stems from the higher levels of uncertainty in the rapidly changing environment, which increases the difficulty of causal planning. Indeed, research findings indicate that effectuation is a superior logic when levels of uncertainty are relatively high and the firm seeks growth, whereas causation suits situations in which levels of uncertainty are relatively low and when a business is mature and stable (Futterer et al., 2017; Read et al., 2009). Similarly, Silvia et al.'s (2018) findings support the use of effectuation in risky environments. Other studies have shown the complementary roles that effectuation and causation play in specific B2B marketing decision-making situations (Yang & Gabrielsson, 2017), different stages of the business lifecycle (Gabrielsson & Gabrielsson, 2013), and various stages of technology implementation (Mero et al., 2020). To benefit from effectual decision-making, we suggest that a firm needs to be equipped with dynamic capabilities that allow it to actualize decisions through the agile renewal of business processes. Particularly in turbulent environments, the ability to sense relevant changes and respond quickly to them has become an important determinant of a company's success (Ngo, Bucic, Sinha, & Lu, 2019; Teece, 2014).

2.2. Effectual and causal execution of dynamic capabilities

Dynamic capabilities have attracted notable scholarly interest since Teece et al.'s (1997) seminal study. Generally, dynamic capabilities are understood as referring to the organizational ability to anticipate, shape, and adapt to changes in the firm's competitive landscape (Felin & Powell, 2016; Teece, 2016). Due to their focus on change, dynamic capabilities are suited to situations of uncertainty (Eisenhardt & Martin, 2000; Sunder, Ganesh, & Marathe, 2019; Teece et al., 2016) and are more valuable in rapidly changing environments than in stable ones (Salvato & Rerup, 2011; Teece, 2014; Zahra, Sapienza, & Davidsson, 2006; Zollo & Winter, 2002). Specifically, dynamic capabilities can be

classified as either sensing, seizing, or transforming capabilities (Baden-Fuller & Teece, 2020; Teece, 2007, 2012). In the following, we present these capabilities and discuss how effectual and causal logic may influence their execution.

2.2.1. Sensing capability

Sensing capability refers to the organizational ability to identify and assess market opportunities and threats (Teece, 2012; Teece et al., 2016), which becomes particularly crucial when the market is undergoing radical changes (Protogerou, Caloghirou, & Lioukas, 2012; Teece, 2007; Yang & Gan, 2020). In practice, sensing takes many forms as it may occur at the individual or organizational level (Teece, 2007; Teece & Linden, 2017) and deploy a variety of information sources (Augier & Teece, 2009; Teece, 2012; Teece et al., 2016). Accordingly, we propose that the execution of sensing activities depends on the firm's decision-making logic. To elaborate, effectuation promotes the collection of informal market information, exploitation of contingencies, and experimentation with creative ideas at all organizational levels, whereas causation promotes systematic collection and analysis of market information that is used to make predictions of future developments (Read et al., 2009; Sarasvathy, 2001). Thus, the firm's sensing activities can be divided into causal and effectual modes (see Table 1). Although effectual sensing has not been explicitly investigated, research show several elements of effectual sensing activities. For example, Guo et al. (2018) highlight that B2B firms need quick and flexible means to capture market information in situations of uncertainty. Specifically, the B2B research emphasizes the importance of absorbing market knowledge from customers rather than benchmarking competitors (Endres, Helm, & Dowling, 2020). According to Guercini, La Rocca, Runfola, and Snehota (2015), it is important to use first-hand information from B2B customers to be able to respond to market changes in ways that meet their needs. Yli-Renko and Janakiraman (2008) elaborate that a focus on customer information nurtures "outside-the-box" thinking that enables firms to avoid path-dependent development of firm-centric processes.

Table 1
Effectuation and causation as alternative perspectives on executing dynamic capabilities.

Dynamic capability	Effectual execution	Causal execution
Sensing	Informal collection of market information	Systematic collection of market information (i.e., market research)
	Imaginative rethinking of how unexpected events can be turned into new opportunities	Competitive analysis of market opportunities
	Experimentation with creative ideas by empowering employees at all organizational levels	Predictions and scenarios of future developments
Seizing	Selection of opportunities based on available means	Selection of opportunities that are in line with strategic goals and business plans
	Seizing opportunities without investing more resources than partners can afford to lose	Seizing opportunities that are predicted to offer the highest return
	Addressing opportunities that can be co-created with partners and stakeholders (shared resources)	Acquisition of resources that are needed to seize selected opportunities
Transforming	Bottom-up approach: employees are empowered to make changes	Top-down approach: managers design and implement changes
	Organic reconfiguration of organizational structures and processes	Formal reconfiguration of organizational structures and processes
	Decentralized organization and cross-functional teams focus on networking	Hierarchical organization and independent departments

2.2.2. Seizing capability

Seizing capability refers to making strategic choices between recognized opportunities and mobilizing resources to address those opportunities (Helfat & Peteraf, 2009; Teece, 2012; Teece & Leih, 2016). Particularly in turbulent environments, the ability to respond quickly and flexibly to recognized opportunities has become an important determinant of a company's success (Guo et al., 2018; Ngo et al., 2019; Teece, 2014), which requires continuous adjustments to resource allocation and rapid implementation of new ideas (Eisenhardt & Martin, 2000; Teece, 2012). In accordance with effectuation theory (Read et al., 2009; Sarasvathy, 2001), causal logic with respect to seizing would guide a firm to select those opportunities that are best aligned with its strategic objectives and predicted to produce the highest return on investment. In turn, effectual logic would guide a firm to select those opportunities that the firm can afford to lose, can best address with available means and resources, and can co-create with partners. Effectual logic in seizing is supported by research that highlights the importance of speed in seizing opportunities under uncertainty with existing resources that can be supplemented by those of partners (Baden-Fuller & Teece, 2020). Some studies stress the creation of cospecialized assets that rely on the joint use of resources with partners, providing each firm with an expanded pool of resources that can be combined in unique ways (Alqahtani & Uslay, 2020; Sadiku-Dushi, Dana, & Ramadani, 2019; Teece, 2007). Additionally, executing small and well-designed experiments speeds up the process of bringing new offerings to market (Day & Schoemaker, 2016). In a similar vein, Teece et al. (2016) propose that firms should build a minimum viable product, launch it, then learn, adjust, and improve it to ensure rapid implementation.

2.2.3. Transforming capability

Transforming refers to the renewal of organizational assets, structure, and culture to adapt to market changes (Teece, 2014; Teece & Leih, 2016), which requires organization-wide reconfiguration (Day & Schoemaker, 2016). Transforming capabilities entailing the continuous renewal of assets and organizational structure ensure that organizations stay supple and responsive in fast-changing business environments (Teece, 2014; Teece & Leih, 2016). In practice, managers play a key role when reconfiguring organizations during adaptation to new circumstances (e.g., Adner & Helfat, 2003; Eisenhardt & Martin, 2000; Helfat et al., 2009). Indeed, managers need to be able to reconfigure both tangible and intangible assets to meet new challenges (Harreld, O'Reilly III, & Tushman, 2007). Consequently, we propose that the execution of transforming activities depends on the firm's decision-making logic. To elaborate, an effectual approach stresses organic and agile changes to existing processes and structures, which are associated with a bottom-up approach to decision-making, whereas the causal approach is formal and goal-oriented and emphasizes top-down decisions and reconfigurations that follow fixed business plans (Read et al., 2009; Sarasvathy, 2001, 2008; Sarasvathy & Dew, 2005a). Thus, the firm's transforming activities can be divided into causal and effectual modes. Effectual transforming is bolstered by research on using dynamic capabilities under uncertainty, which favors effectual transforming activities. For example, an agile and entrepreneurial mindset combined with an expansive perspective on network-building is at the core of the transforming capability (Day & Schoemaker, 2016). Transforming capabilities become particularly important in the context of radical market changes, when responding to these requires large-scale changes to the firm's operations (Gabrielsson & Gabrielsson, 2013; Hills, Hultman, & Miles, 2008; Jantunen, Tarkiainen, Chari, & Oghazi, 2018). Table 1 summarizes the effectual and causal execution of dynamic capabilities.

3. Methodology

3.1. Data collection

We adopted a qualitative approach to collecting and analyzing data to generate in-depth understanding of B2B firms' efforts to execute dynamic capabilities under situations of unexpected uncertainty. The data collection consisted of two rounds that used slightly different criteria in key informant selection. The first data collection round was performed between September–December 2019. The sample criteria for the first data collection round were defined at a firm and key informant level. At the firm level, we approached small and medium-sized enterprises (SMEs) that represented different B2B industries. We focused on SMEs because they are more likely to rely on effectual reasoning (e.g., Roach et al., 2016), and therefore, it increased the likelihood of capturing *effectual* elements in executing dynamic capabilities. Different industries were preferred to get diverse aspects to the topic, leading to richer empirical findings (Patton, 2014; Yin, 2003). Since the pool of potential companies was large, we searched extensively for publicly available news stories and articles to identify B2B firms that had navigated situations of unexpected uncertainty (e.g., due to technological or market disruption) by renewing their business models, strategies, or operations. This approach was considered to increase the fit of the target firms to our research goal. At the key informant level, we approached for the individual with highest authority within the firm to obtain the most profound knowledge of the firm's overall response to uncertainty. Before contacting, we ensured that the individual had a long history with the firm to be able to reflect how the firm encountered and navigated the situations of uncertainty. As a result, we conducted interviews with the chief executive officer or chairman of the board (former chief executive officer) of nine firms from different industries. The situations of uncertainty that the participating companies were facing ranged from demand-based crises and regulatory changes to competitive and technological disruptions. The common denominator was that all these events were unexpected, and the firms had very limited time to formulate a response.

While analyzing the data from the first data collection round, COVID-19 emerged as a global concern, causing a major disruption in the global marketplace. This unfortunate event provided an exceptional opportunity to examine timely managerial perceptions of and responses to an event of unexpected uncertainty. Thus, we decided to organize another data collection round to increase the internal validity of our findings by mitigating the potential memory biases that were likely to affect the first data collection round, which focused on past events. Accordingly, the second data collection round was conducted after the outbreak of COVID-19 (April–November 2020). For this round, we approached the same nine key informants but were able to recruit only four of them for an additional interview. To complement our data, we decided to recruit key informants from other B2B firms. Since our preliminary analysis had demonstrated a strong reliance on effectual reasoning in executing dynamic capabilities in the context of SMEs, we decided to target large-sized companies in order to enrich the findings and increase their external validity. Due to the larger size of these companies, we recruited multiple key informants from each company to obtain a holistic view of their execution of dynamic capabilities.

In total, our sample consists of 24 interviews with 20 managers representing 13 companies that are based in Finland. Each company represented a different industry, and the firm size ranged from under 250 employees to over 30,000. Each interview lasted 43–65 min. The characteristics of our interview data are presented in Table 2. In the first interview round, the key informants were asked to describe the situations of uncertainty that they had encountered as a firm and explain how they navigated these situations. Besides the descriptions, we asked specific questions on sensing, seizing, and transforming activities, in accordance with our analytical framework (see Table 1). The interview questions were open-ended in nature, and we encouraged the informants to share any insights that they considered relevant. Furthermore, we used probing questions to follow up on interviewee responses to encourage elaboration. Notably, the interviewees were not aware of our study's theoretical aim, which increased the internal validity of their responses. The second interview round followed a similar structure, but the key informants were asked to focus specifically on COVID-19 as a situation of uncertainty. All interviews were audio-recorded and transcribed to allow detailed analysis.

Table 2
Key informants.

Firm	Field of business	Type of uncertainty	Title of key informant(s)	Length (min) 1st round	Length (min) 2nd round
1	Health	Competitive disruption & COVID-19	Chief Executive Officer	43	48
2	Event production	Demand-based crisis & COVID-19	Chief Executive Officer	53	55
3	Software design	Demand-based crisis & COVID-19	Chief Executive Officer	54	44
4	Beverages	Regulatory change & COVID-19	Chief Executive Officer	60	47
5	Sports technology	Technological disruption	Chief Executive Officer	58	
6	Food	Demand-based crisis	Chairman of the Board	62	
7	Legal consultancy	Technological disruption	Chief Executive Officer	60	
8	IT services	Technological disruption	Chief Executive Officer	53	
9	IT applications	Demand-based crisis	Chief Executive Officer	55	
10	Energy	COVID-19	Senior Vice President Sales and Customer Service		62
			Head of Customer Service		61
11	Travel	COVID-19	Chief Commercial Officer		55
			Vice President Customer Service		58
12	Finance	COVID-19	Executive Vice President		62
			Head of Business Unit 1		56
			Head of Business Unit 2		65
			Head of Business Unit 3		54
			Head of Business Unit 4		50
13	Insurance	COVID-19	Senior Vice President of Client Service		61
			Head of Business Customers		49

Notes: Firms 1–9 represent B2B SMEs; Firms 10–13 represent large-sized B2B firms.

3.2. Data analysis

Our analysis logic balanced between inductive theory generation and deductive theory verification by contrasting theory with empirical insights (Orton, 1997). To elaborate, we followed a pre-designed analytical framework (Table 1) that was allowed to evolve on the basis of empirical insights (Dubois & Gadde, 2002). In other words, our analytical framework formed the basis for analysis, but we enriched and refined it by matching the framework with the empirical data. This process led to the final empirical framework. Next, we describe the analytical process in more detail.

The preliminary data analysis occurred in parallel with data collection as the interview transcripts were read carefully by both researchers throughout the data collection periods, which were followed by discussions of key insights. Once the whole dataset was collected, the transcripts were further reviewed multiple times before the formal analysis process began. We used a three-step thematization procedure involving data condensation, data display, and conclusion drawing (Miles, Huberman, & Saldana, 2014). In the data condensation phase, we identified activities that companies performed under uncertainty and labeled them with descriptive codes (e.g., collaboration with partners, co-creation with customers, market research, and learning by doing) by using NVivo© 12 software. Furthermore, we eliminated data that was clearly out of the scope of this study. In the data display phase, we aggregated the descriptive codes under broader categories that, in accordance with our analytical framework, reflected the effectual and causal sensing, seizing, and transforming activities. When drawing conclusions, we compared similarities and differences between different companies and key informants and determined the underlying decision-making principles that were manifested in the activities that companies performed. Consequently, we developed our analytical framework into an empirically enriched framework that suited our data. In the following, we present the empirical framework in detail.

4. Findings

The study data provided strong support for B2B firms' effectual decision-making in executing dynamic capabilities under unexpected uncertainty. Indeed, the vast majority of firms' sensing, seizing, and transforming activities were determined by effectuation logic. The causal elements that we found were related to conducting formal market research to support informal market sensing, which was particularly evident among large-sized B2B firms. Furthermore, the firms were found to place more emphasis on planning and prediction in stable environments, but in situations of uncertainty, the value of causal planning was considered limited. Even the key informants from large companies reported that the COVID-19 pandemic had forced them to rethink the role of planning and shift toward faster and more agile decision-making.

Since the role of causation was found to be minor in situations of uncertainty, we focused on the effectual sensing, seizing, and transforming activities in reporting our findings. Overall, the role of effectuation was manifested in distinctive decision-making principles applied by the companies. First, the *basis of business strategy* was focused on creative market-shaping and turning unexpected events into business opportunities when facing uncertainty. These opportunities were identified primarily through an in-depth understanding of customers' goals and challenges in their professional lives and business ecosystems. Second, *the assessment of business opportunities* was guided by the available means (e.g., resources, knowledge, and skills) and affordable losses rather than strategic goals and profit maximization. In particular, the interviewees systematically emphasized that unexpected business opportunities that created value for customers were prioritized. Third, with respect to *attitude to outsiders,* open collaboration with external partners and willful agents was emphasized. In this regard, customers were perceived as key partners in developing and co-creating business offerings and processes. In all cases, the participants reported that the significance of the role of customers as key partners increased when navigating uncertainty.

The data analysis enabled us to explicate how effectual logic was applied in the key activities through which the interviewees executed dynamic capabilities under unexpected uncertainty. To elaborate, we identified three key activities in each dynamic capability category (i.e., sensing, seizing, and transforming) that derived from effectual reasoning. These activities are discussed in detail in the following subsections. presents our empirical model, distinguishing the decision-making logic and key activities involved in executing dynamic capabilities Fig. 1.

4.1. Sensing activities

We identified three effectual sensing activities that the participating B2B firms frequently performed when facing unexpected uncertainty. First, the companies highlighted that *the collection of customer insights* via *informal discussions and feedback* was the most crucial means of sensing the implications of unexpected events. The interviewees stated that it was vital to interact with customers continuously to garner insights into customers' business problems and goals in uncertain circumstances, as well as their individual thoughts and feelings regarding market changes. Based on these discussions, the case companies were able to realize novel trends in customer needs and *weak signals* of new opportunities for exploiting contingencies and shaping existing markets. In addition to informal interactions, one firm (Event production) used focus group sessions to collect ideas from key customers, which were used as raw material in creating new processes and offerings. Notably, in the second round of interviews (i.e., after COVID-19), the emphasis on collecting input from customers became even more intense. The firms stated that the most important action at the outbreak of COVID-19 was to obtain information about customers' situations and determine ways to help them through the crisis.

> *[Under uncertainty], it is important for us to stay in connection with customers. We do not fly around the world, but we skype with them and keep up the good relationship. We ask how they are doing. It is more than just to buy products from us. That way, we get a lot of timely information of their needs.* (Chief Executive officer, Health).

> *After the pandemic began, we really started to listen to our customers. In our discussions with customers, we tried to find the issues that would help them. We really raised our ambition level on understanding what's best for customers and what's happening in their lives. For that, we found the best way was to directly speak with customers.* (Senior Vice President of Client Service, Insurance)

The second activity concerned *active sharing of customer insights throughout the organization*, which was considered critical in capitalizing on customer insights generated by different members of the organization. Several participants argued that in events of unexpected uncertainty, the need to share customer insights on all levels and functions increased. A common view among the participants interviewed after the COVID-19 outbreak was that previous uncertainty situations had taught the organizations to focus on customer insights and the importance of disseminating information throughout the organization, but the COVID-19 pandemic had remarkably intensified the dissemination practices.

> *We use a lot of time to collect feedback from customers, their experiences of our services and insights, and to share the information throughout the organization. For example, we use external facilitators to help us organize and go through the feedback in workshops, where everyone in the organization participates.* (Chief Executive Officer, Event production).

> *The pandemic tightened us in the organization very quickly. Suddenly, we simply started to look at things together. Everyone wants to know what customers are saying and what we can do next. It's now our responsibility to make sure that the feedback we get from customers is available for*

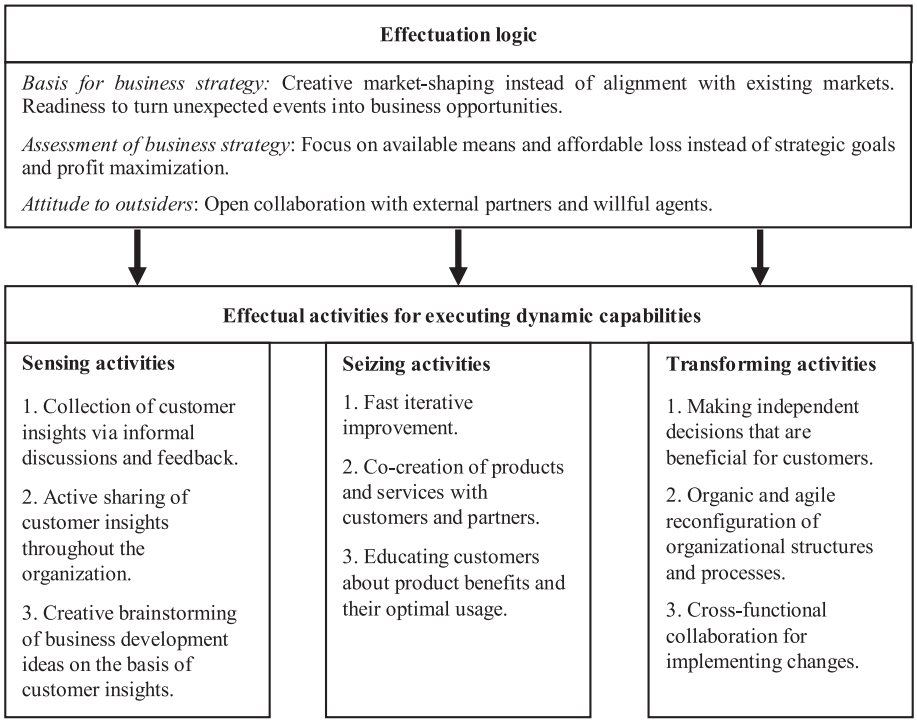

Fig. 1. Executing dynamic capabilities under uncertainty.

different parts in the organization. It became natural to look at things together. (Head of Business Customers, Insurance).

The third activity was the *creative brainstorming of business development ideas on the basis of customer insights*. This activity was vital in refining various customer inputs into actionable business opportunities because customers often could not express the exact solution that they needed to overcome specific business problems. It was noted by several participants that when facing unexpected uncertainty, they were forced to brainstorm quickly on customer feedback. It was important that the companies turned these insights into actionable business ideas that had the potential to meet customer needs.

In our own meetings, we started to do things much quicker. Customers' feedback forced us to take actions. We are extremely good at planning long processes as well as ventilating about whether to do it this way or that. Now, the situation forced us to act. We took steps forward, tested new things, and then, along the way, made things better. First, we made things good for customers and then had discussions internally to make them even better. (Head of Business Unit 2, Finance).

Quite often, a customer does not understand what he or she needs. That is when we need to start resolving it. Often even we do not know what is specifically needed, but we see that customers have certain kinds of challenges or could benefit from certain kinds of issues. We then start brainstorming and quite often come up with a totally new solution. (Chief Executive Officer, Sports technology).

4.2. Seizing activities

When something extremely unexpected happens, firms need to select their courses of action quickly. In this respect, the first effectual seizing activity, *fast iterative improvement*, plays an important role and forms a logical continuum with the business development ideas generated in the sensing phase. The interviewees perceived fast iterations as a means to decrease the risk of failure because they allow firms to test novel ideas quickly and without investing heavily in them before reaching a proof-of-concept. While fast iterations were considered important in all types of unexpected events, the COVID-19 pandemic had created a need to be even quicker and more agile to obtain ideas for testing.

In practice, we do a light version of a service, describe it verbally, and interview 5 to 10 customers. We want to have a good picture of it before we start any coding. We test already in the [product] concept phase. Testing the final product is extremely expensive. So, we do it cyclically. We do one version, test it, improve it; we do a second version, and so on. The goal of every phase is that the next version is better and more near the customer value we want… When something big, such as the COVID-19 pandemic, happens, then we bring the acute initiatives customers are asking [for] directly for testing, even though those would not have been in plans before. (Chief Executive Officer, Software Design).

[In situations of unexpected uncertainty] I encourage our people to just do it. I prefer a quick analysis followed by testing, further analysis, further testing and so on. (Head of Business Unit 1, Finance).

The second activity focused on the *co-creation of products and services with customers and partners*. While iterative testing of novel ideas with customers could be considered a form of co-creation, the interviewees highlighted that during unexpected uncertainty, the collaboration went beyond testing early-stage ideas and formed a culture in which customers or other partners participated in the continuous improvement of product and service offerings. Because unexpected uncertainty forces companies to make quick adaptations, the firms focused on the available means and proceeded with trial-and-error approach. It became evident that successful co-creation required a balanced approach that matched a firm's expertise and the needs of its customers.

A good example of innovative cooperation with existing partners during the pandemic is what we did with one partner. We had in one function employees that were needed but not full-time anymore. Then, they (the partner) started to innovate possibilities of how those people could be used. There were ideas coming from different units and from different partners, and then we just compiled those and found this new innovative product. The agility, culture of small experiments, and that no big investments were needed helped us. (Vice President, Travel).

In the beginning, we developed [offerings] without asking anyone, and it was a disaster. Second, we were totally based on customer ideas and wants without know-how from us, and it was a disaster. Finally, we started to work together with a number of customers and partners, and that was sound activity and led to success. (Chief executive officer, IT services).

Third, *educating customers about product benefits and their optimal usage* was another key activity identified in the data analysis. While co-creation enabled the companies to match their offerings with customer needs, it was equally important to inform customers about how the offering could be used in specific cases and business problems. The key method used to educate customers was sharing informational content (e.g., whitepapers, videos, podcasts, webinars, and user guides) via various digital channels. Previous situations of unexpected uncertainty had taught the importance of this activity, though after the COVID-19 outbreak, its speed was at a new level. The participants explained that there was suddenly an urgent need to tell customers how firms could help them.

During recent years, we have done a lot to teach customers, but the pandemic increased the speed. Now everyone in [the] organization is asking for a possibility to arrange [a] webinar to get a possibility to show customers how to use the service. We are now really on a new level when it comes to the customer education. (Head of Business Unit 4, Finance).

COVID-19 changed the customers' situation overnight. We tried to help customers by being proactive and telling them about alternative solutions that we can offer. We tried to produce content that would immediately support customers… We decided to invest in digital couching sessions. It was like an academy that was really helpful from the COVID-19 perspective, and the customers were very thankful. The ideas for couching sessions were based on what customers want. For example, they provided themes for podcasts. Then we checked if there is a broader need for the topic and made them with a low threshold. (Head of Business Customers, Insurance).

4.3. Transforming activities

Transforming was realized in three core activities. The first activity highlighted *making independent decisions that are beneficial for customers*. All interviewees specified that employees must be empowered and capable of making independent decisions in interacting with customers and solving their acute problems in situations of unexpected uncertainty. This bottom-up approach gives employees the power to tailor offerings and processes to customer needs, which often leads to changes in existing organizational routines and workflows. Although independent decision-making decreases management's ability to control operations, it is vital in resolving customers' concerns quickly, which serves to gain their trust and loyalty during uncertainty. The managerial challenge was to provide employees with clear guidelines for exercising power appropriately.

Now, we talk much more than before with employees and supervisors who are near customers. In practice, they are then able to independently put the ideas in action, and we [management] just follow (Chief Executive Officer, Beverages).

In a crisis situation, everyone is empowered to take the responsibility and take things forward. Everyone is allowed to make mistakes. (Head of Business Unit 1, Finance).

Our model is absolutely bottom-up. To tell the truth, it is not always easy. Our employees have a lot of power, but it is dependent on a person how much they use it. They can make decisions while talking with customers; they do not need to ask anyone. (Chief Executive Officer, Health).

Second, the findings showed that independent decision-making could not lead to real transformation unless the organization supported an *organic and agile reconfiguration of organizational structures and processes*. Several interviewees mentioned that processes and structures directly affecting customers were changed organically by individual members and teams in the organization. Such organic reconfigurations are critical in ensuring good customer experiences. In situations of unexpected uncertainty, the changes became more intense.

We changed [the business model] very quickly. In a few months, we changed the whole viewpoint on our operations. Our success comes from the fact that we've been able to make quick changes without banging our heads against a wall for a long time. (Chief Executive Officer, IT Services).

We need to be able to react to changes and change the organization organically. Most structural changes have started from the willingness to change things based on customer feedback. We want to be agile. (Head of Business Unit 3, Finance).

The third activity concerned *cross-functional collaboration in implementing changes*. In practice, collaboration is actualized via cross-functional teams whose capabilities are sufficient to meet customer needs. Collaboration supports independent decision-making as employees do not have to rely on other functions to change organizational processes, which was highlighted as critical in situations of unexpected uncertainty; each team has the skills, resources, and authority to implement changes that create value for customers. Cross-functional teams flatten and decentralize the organization's structure, which further supports the agile and organic reconfiguration of both structures and processes. The interviewees highlighted that cross-functional teams must function autonomously to be able to address customer needs, especially in situations of unexpected uncertainty.

We aim to keep the organization very flat. The power and responsibility should be as close to customers as possible. Teams have an entrepreneurial responsibility where they are empowered to do the job as a single team. (Chief Executive Officer, Beverages).

There is practically no issue that our teams cannot take care of, because each team consists of all types of competencies. This is how we ensure smooth reaction to all kinds of issues and events. Everything can be managed in the frontline. (Head of Business Unit 4, Finance).

5. Discussion

5.1. Theoretical contributions

This study makes three important contributions to theory. First, this is the first study to integrate the theories of dynamic capabilities and effectuation into a unified model to provide a better explanation of how companies can adapt to market changes caused by unexpected uncertainty. In so doing, we complement the dynamic capability literature that has previously focused on navigating *deep uncertainty* characterized by unpredictable but recognizable environmental changes (Teece, 2016; Teece et al., 2016). When the source of uncertainty is recognized (e.g., technological development), organizations can proactively use scenario planning or draw conjectures about the effects of potential environmental changes on the organization and subsequently prepare themselves for possible futures by reconfiguring organizational capabilities and processes (Teece, 2007; Warner & Wäger, 2019). However, in situations of unexpected uncertainty, an organization has limited time to formulate a response, which shifts the focus from proactive to reactive measures. Since effectuation focuses on exploiting contingencies that result from surprising events in the marketplace (Sarasvathy, 2001), it is ideally suited to situations of unexpected uncertainty as it enables an organization to formulate prompt and agile responses.

As its second contribution, this study provides an activity-based model for executing dynamic capabilities via effectuation. In this regard, the study goes beyond descriptive manifestations of effectuation

logic in executing dynamic capabilities by identifying the effectual sensing, seizing, and transforming activities that facilitate an organization in formulating prompt and agile responses to situations of unexpected uncertainty. Many identified activities resonate with Teece et al. (2016), who discuss the necessary role of organizational agility in the use of dynamic capabilities to address deep uncertainty. For example, they suggest that the agile use of seizing and transforming capabilities benefits from the absence of organizational hierarchy, elements of self-organization, open innovation methodologies, and iterative product development processes. Nevertheless, Teece et al. (2016) start with the assumption that companies must proactively sense environmental trends and their implications for the marketplace and make hypotheses about the future to ensure sufficient time to prepare for alternative scenarios. Consequently, their sensing activities emphasize the use of scenario planning, whereas the identified sensing activities in this study focus on informal means to collect and share customer insights to ensure rapid response to situations of unexpected uncertainty. Thus, our activities complement the agile use of dynamic capabilities by showing that events of unexpected uncertainty require a different set of sensing activities.

As its third contribution, the study findings enrich effectuation and dynamic capabilities theories by uncovering the interlinks and complementarities between the two, responding to calls for exploring their relationship to other theoretical constructs (Engel et al., 2017; Perry et al., 2011; Schilke et al., 2018). By drawing upon the interlinks between dynamic capabilities and effectuation theories, we identify several reasons why they are ideal counterparts in responding to unexpected uncertainty. First, both theories are suited to uncertain and rapidly changing rather than predictable and stable environments. However, dynamic capabilities emphasize state and effect uncertainty (i.e., unpredictable environmental change and its effects on firms; Teece et al., 1997), whereas effectuation emphasizes response uncertainty (i.e., unpredictable consequences of response options to an unanticipated event; Sarasvathy, 2001). In this respect, our study findings imply that effectual logic speeds up the formulation of response options to an event of unexpected uncertainty and allows their iterative improvement. However, dynamic capabilities are needed to complement effectuation because they provide the means to actualize effectual responses through the renewal of extant processes. Second, both theories criticize the conventional strategic paradigm to protect one's competitive position (see e.g., Porter, 1980), and instead build on the resource-based perspective (Barney, 1991; Rumelt, 1984), promoting the focus on controllable rather than predictable aspects of the business. However, dynamic capabilities place particular emphasis on strategic renewal and reconfiguration of the firm's extant resource base (Helfat & Winter, 2011; Schilke et al., 2018; Teece, 2007), while effectuation takes the firm's extant resource base as given and focuses on the short-term effects that can be created with them (Sarasvathy, 2001). Our findings imply that in the events of unexpected uncertainty, effectual logic enables a firm to create quick effects but creating them requires dynamic configuration of the firm's extant resource base. Third, both theories promote entrepreneurial management as the key aspect of navigating uncertainty, although dynamic capabilities rely more on one or a few entrepreneurial managers' cognitive abilities, knowledge, and skills (e.g., Teece, 2012), while effectuation fosters a more participatory culture in decision-making that often involves external partners (Sarasvathy, 2001). The findings of this study support a balanced approach where entrepreneurial managers have a key role in responding to unanticipated events but benefit from involving and empowering other stakeholders. In particular, the findings of this study highlight the importance of involving customers in formulating responses to events of unexpected uncertainty. To elaborate, sensing activities relied primarily on customers' insights, and seizing activities included strong collaboration and co-creation with customers to develop effective responses. This result further supports Endres et al.'s (2020) idea that sourcing from B2B customers is indispensable to a firm's sensing capability, as well as Heinonen and Strandvik's (2021) idea that a crisis accentuates customer primacy.

5.2. Managerial implications

The findings of this study have important implications for how to prepare for navigating uncertainty and how to deal with events of unexpected uncertainty. When preparing for navigating uncertainty, it is important to recognize the difference between recognizable and unexpected events of uncertainty that require different courses of action. By recognizable events, we refer to situations that are unpredictable but at least partially foreseeable, such as technological trends or the threat of an upcoming recession. By unexpected events, we refer to events that managers are simply unable to foresee but require quick responses. Such events are not limited to so-called *black swans* or rapidly evolving macro-level events that are almost impossible to foresee (e.g., COVID-19) but can be much more mundane. For example, a key customer account can terminate a relationship, or a competitor may shape markets with a new offering or business model. A skillful manager may be able to foresee some of them, but since human beings are fallible, unexpected events occur despite organizational efforts to sense them.

The distinction between recognizable and unexpected events is important because they must be addressed with different means. Recognizable events and trends usually unfold over time and therefore can be proactively sensed by following Teece's (e.g., 2016) ideas of using scenario planning and making conjectures of possible futures. Consequently, managers can take preemptive steps by, for example, developing new capabilities or stockpiling resources. Instead, events of unexpected uncertainty require fast and reactive responses. The key findings of the study imply that when a firm faces an unexpected situation of uncertainty, the managers should 1) involve organizational members to make sense of the situation by contacting customers and other stakeholders and foster effective means to disseminate the insights across the organization to speed up the process of formulating an effective solution; 2) start with a minimum viable solution and iteratively improve it by involving key customers to ensure the market fit; and 3) empower employees to make autonomous decisions for tailoring the solution and reorganizing structures and processes to facilitate cross-functional collaboration. Since these activities assume a higher degree of autonomy for employees, it is vital that the managers foster a participatory culture so that the employees are not afraid of taking the initiative.

While this study focused on events of uncertainty, it is important to highlight the longitudinal aspects of navigating uncertainty and the drawbacks of agile processes. In most cases, environmental uncertainty is not a fixed state, but its level fluctuates over time. At stable times, agile processes for navigating uncertainty may easily backfire. For example, informal customer feedback is more subjective and biased than formal market research, which may guide the firm to act upon misleading insights or devoting resources to develop solutions that have little market demand. The independent decision-making and agile reconfiguration of organizational structures and processes decrease managerial control, which may blur the strategic direction of the company. Similarly, a higher degree of employee empowerment to make autonomous decisions can be a significant job stressor and have negative effects on employees' well-being, which is a highly important aspect of using dynamic capabilities. Especially during severe uncertainty, it is crucial to create a culture of caring to ensure a psychologically secure emotional climate (Hodgkinson & Healey, 2011). As Teece et al. (2016) put it, organizational agility should not be treated as an immutable quality because it comes with a cost, as an organization must always balance agility and efficiency. Thus, at stable times, companies are likely to waste resources to ensure agility and should instead maximize efficiency, while at turbulent times, companies should focus on agility at the cost of decreased efficiency to ensure speedy responses to market uncertainty. It follows that managers should be able to change the mode of

executing dynamic capabilities between agility (or effectuation) and efficiency (or causation). The question of how to switch this mode is beyond the focus of this study, but we assume that SMEs are in an advantageous position in this regard. Regardless of company size, we recommend that managers design steps that would allow improved agility when facing increasing uncertainty or an event of unexpected uncertainty. Indeed, switching the mode between efficient and agile processes may, in fact, be the true meaning of organizational agility.

5.3. Limitations and future research

Like many qualitative studies, this study is limited by its lack of statistical generalizability (Dubois & Gibbert, 2010; Yin, 2003). This study investigated the decision logic used by 13 B2B firms based in Finland to execute dynamic capabilities in the context of unexpected uncertainty. In general, the sample of 13 firms does not allow us to claim that the results can be generalized beyond the sample. Instead of seeking statistical generalizability, qualitative studies aim to achieve analytical generalizability, which refers to the extent to which empirical observations are generalizable to a theory rather than to a population (Yin, 2003). Accordingly, the findings of this study are designed to be generalizable to theory. However, because this study is one of the first attempts to examine how an effectual approach affects dynamic capabilities, further studies need to be conducted to improve the external validity of the results. Specifically, we assume that the same combination of effectuation and dynamic capabilities may apply across different countries and industry sectors (including B2C). However, the exact set of sensing, seizing, and transforming activities and their implementation may vary in different contexts. For example, the *co-creation of products and services with customers and partners* may be favorable in B2B contexts, which are often associated with fewer but closer buyer-seller relationships (Hutt & Speh, 2021). In turn, *active sharing of customer insights throughout the organization* and *making independent decisions that are beneficial for customers* may be easier to implement in cultures that feature consensual (vs. top-down) attitudes toward decision making and egalitarian (vs. hierarchical) attitudes toward authority, which are often found in Scandinavia and Northern Europe (Meyer, 2017). Besides national culture, the existing organizational culture is likely to play an important role in how effectively the effectual activities are implemented. While in some organizations the higher degrees of employee autonomy may encourage employees to take the initiative, in other organizations it may lead to inertia (Teece, 2012).

Finally, recent studies have highlighted the importance of investigating different factors and situations of uncertainty (e.g., Crick & Crick, 2020; Sharma, Leung, Kingshott, Davcik, & Cardinali, 2020). Our study specifically focused on contexts of unexpected uncertainty, leaving very little room for careful analysis and planning that is characteristic of causal decision-making because the firms are forced to respond rapidly. This may be why we found very little evidence of causal reasoning in our study. Consequently, it would be relevant to study the role of effectual and causal reasoning in situations that entail moderate levels of uncertainty where the mode of reasoning may be more balanced. In particular, longitudinal research on the use of dynamic capabilities over time could reveal the dynamics between effectual and causal reasoning, as market turbulence fluctuates. The framework developed in this study could be used as a foundation, but it may need to be adjusted to such contexts.

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Data availability

The data that has been used is confidential.

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