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Effectual and causal reasoning in the adoption of marketing automation

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A B S T R A C T

Research on technology adoption in organizations traditionally assumes that these organizations follow rational, strategic and planned adoption processes. However, a gradually emerging view is that the adoption of technology is also characterized by entrepreneurial or effectual reasoning, primarily due to technological and market uncertainties that call for more agile and experimental approaches at the digital age. Drawing on effectuation theory, we develop a research framework to examine the managerial reasoning during the adoption of marketing automation technology. Based on the results of a comparative multiple-case study on four large-sized industrial firms, we develop a maturity model of marketing automation adoption and show that even large-sized B2B companies apply effectual reasoning, which problematizes the rationality assumption in the technology adoption literature. Second, we show that during the adoption process, organizations' dominant reasoning mode follows an iterative pattern in which the adopting organization moves back and forth between effectuation and causation. Finally, we identify five key domains of marketing automation (customer knowledge, information systems infrastructure, analytics, interdepartmental dynamics and change management) and describe their gradual evolution at different stages of the adoption process.

1. Introduction

The adoption of new technologies is considered an important source of business opportunities. However, it is also known that many organizations fail in their technological initiatives (King & Burgess, 2008; Rehn & Lindahl, 2012). The literature suggests that in order to avoid these failures, technological pioneering should be strategic and carefully planned (e.g., Powell & Dent-Micallef, 1997; Zahra, Nash, & Bickford, 1995). Accordingly, the theoretical frameworks of technology adoption in organizations (e.g., Rogers, 1995; Tornatzky & Fleischer, 1990) implicitly assume that the decision to adopt and implement technologies is determined by a rational evaluation of benefits and costs. Simultaneously, the literature recognizes that the adoption decision may also be influenced by external market pressures (Kuan & Chau, 2001; Srinivasan, Lilien, & Rangaswamy, 2002), uncertainty related to the organizational environment (Ahonen, Savolainen, Merikoski, & Nevalainen, 2015) and to the technology being adopted (Frambach & Schillewaert, 2002). Such factors hamper a firm's ability to make rational plans and formulate strategies because the benefits and costs may be difficult to foresee. Consequently, this study suggests that early adopters may rely on a more entrepreneurial (i.e., effectual) approach when pursuing business opportunities with new technologies.

Effectuation theory (Sarasvathy, 2001) conceptualizes two alternative logics for pursuing business opportunities. First, causation or causal reasoning refers to the strategic, goal-directed and planned decision-making logic that is best suited for long-term business planning in mature markets. In contrast, effectuation or effectual reasoning is an entrepreneurial decision-making logic that focuses on making the most of the resources and means available. Effectuation suits situations of uncertainty in which it is difficult to make accurate plans and predictions about the future. Since the current digital and global market environment is characterized by increasing complexity and rapid changes, firms face situations of uncertainty at an accelerating pace (Day, 2011). In turn, we argue that the growing uncertainty paves the way for organizations' greater reliance on effectuation.

Current evidence on effectuation in the context of technology adoption is scarce but gradually emerging. Alford and Page (2015) find that owner-managers of small businesses rely on effectual reasoning when adopting marketing technologies. While the origins of effectual reasoning are in the entrepreneurship context, its occurrence is not limited to entrepreneurs. Johansson, Ellonen, and Jantunen (2012) find that relatively large magazine publishing companies also use effectual reasoning when integrating new media into their businesses. Because the adoption of a new technology represents a situation of uncertainty, it is likely that even large firms harness effectual reasoning at different phases of the technology adoption process. However, more research is needed to increase our understanding of the roles of effectuation and causation in different stages of the technology adoption process.

Against this backdrop, this study aims to develop a framework that illuminates the dynamics of effectuation and causation logics in the organizational adoption of new technology. To reach its goal, this paper employs a comparative multiple-case study and investigates the phenomenon in four large-sized industrial firms. The technology under investigation is marketing automation (hereafter MA), which is

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attracting increasing attention in the B2B sector (Järvinen & Taiminen, 2016). MA is considered a suitable technology for studying the phenomenon because effectuation logic is likely to manifest in situations of uncertainty (Sarasvathy, 2001), and the adoption of MA is considered to cause uncertainty in the adopting organizations for two major reasons. First, MA represents a novel technology that creates technological uncertainty. Academic research concerning MA is in its nascent stage, and many organizations still struggle to make sense of its potential (Wood, 2015). Second, MA is used to interact with the market environment (i.e., customers and other stakeholders), which is constantly in flux and, thus, a major driver of uncertainty (Chetty, Ojala, & Leppäaho, 2015; Read, Dew, Sarasvathy, Song, & Wiltbank, 2009). To elaborate, the benefits of the adoption process are unpredictable and difficult to control because they are partially dependent on the market response. In contrast, when a technology is adopted for internal usage (e.g., Intranet), the benefits largely depend on the firm's controllable actions.

The study contributes to theory by challenging the simplistic view of technology adoption as a goal-oriented and rational process. Instead, we show that even large-sized companies harness effectual reasoning when they adopt a technology under uncertainty. For its second contribution, this study presents a maturity model that describes how organizations' dominant mode of reasoning varies between effectuation and causation over the course of the adoption process. Finally, this study complements the limited knowledge regarding MA by identifying MA's key domains and demonstrating their evolution over time.

The manuscript is organized as follows. The literature review presents a brief overview of MA. Then, we discuss the differences between effectual and causal reasoning. Subsequently, we review the existing literature concerning the organizational adoption of technologies and conclude the theory section by presenting the framework of our inquiry. We then justify our methodological choices and explain the data collection and analysis methods. Finally, we present the findings of this study, discuss their implications, and provide avenues for future research.

2. Marketing automation

Approximately two decades ago, Bucklin, Lehmann, and Little (1998) wrote that the role of technology in marketing is to move from 'decision support to decision automation' by 2020. They predicted that a proportion of marketing decisions will be automated due to the demands for mass customization, better decision making, and greater productivity. Today, this vision has become reality, and marketing automation is steadily growing in popularity as a business tool and as a research phenomenon. The current literature on MA has focused primarily on conceptualizing MA and explaining its operating logic (Bagshaw, 2015; Heimbach, Kostyra, & Hinz, 2015; Järvinen, 2016), while few empirical papers exist on how MA is integrated into strategic marketing processes. One exception is the case study by Järvinen and Taiminen (2016), who demonstrate how an industrial B2B firm uses MA for integrating marketing and sales processes and delivering behaviorally targeted marketing content for customers at different stages of their purchasing processes.

The literature offers two main perspectives regarding the definition of MA. First, MA is considered a *technology or tool* used to automate marketing operations. Accordingly, Buttle and Maklan (2015, p. 232) define MA as "the application of computerized technologies to support marketers and marketing management in the achievement of their work-related objectives". Similarly, other scholars have defined MA as a tool used to perform specific tasks, such as the automatic personalization and behavioral targeting of marketing activities (Heimbach et al., 2015; Järvinen, 2016). The second perspective perceives MA as a *strategic initiative* that has the potential to revolutionize organizational structures, processes and culture of how marketing is conducted (Järvinen & Taiminen, 2016). Similarly, MA is perceived as a core resource of strategic marketing (e.g., Del Rowe, 2016; Ginty, Vaccarello, & Leake, 2012) and defined as "a centerpiece in terms of companies' communication strategy, their customer engagement strategy" (Del Rowe, 2016, p. 24).

In this study, we define MA as a technology leveraged to improve the effectiveness and efficacy of marketing operations via automated, personalized and analytics-driven activities. However, we acknowledge that the benefits of MA largely depend on the strategic transformation of the organizational structures, processes and customer-centric culture that guide the use of MA. Therefore, this study focuses on the evolution of organizational structures, processes and culture during the MA adoption process rather than MA-enabled marketing activities per se.

Extant research recognizes that firms may develop new technologies within the firm (Ardito, Messeni Petruzzelli, & Albino, 2015) or acquire technologies from markets (Ardito, Natalicchio, Messeni Petruzzelli, & Garavelli, 2018; Natalicchio, Messeni Petruzzelli, & Garavelli, 2014). However, we limit our inquiry to MA technologies acquired from the market because few organizations develop MA technologies due to cost-efficiency reasons; Becker (2019) estimates that building a sophisticated MA system in-house may cost up to 800 million U.S. dollars, while the most sophisticated MA software available on the market cost between $3000–5500 per month.

Specifically, we focus on state-of-the art MA software (e.g., ClickDimensions, Eloqua, HubSpot, Marketo, and Pardot) that offer advanced features to the adopting organizations. These features include the generation of customer insights along the customer journey, behavioral targeting, automated personalization of marketing communications across channels, streamlined sales lead management, and improved transparency regarding marketing productivity in terms of which customer touchpoints are related to the customers' purchasing decision.

3. Modes of reasoning in the organizational adoption of technologies

3.1. Causal and effectual reasoning

Effectuation theory is rooted in entrepreneurship research. Sarasvathy (2001) argues that in contrast to the extant entrepreneurship theories, entrepreneurs do not follow rational decision-making models (i.e., causation processes) but employ effectuation processes when pursuing entrepreneurial opportunities. In these effectuation processes, decision makers begin with general aspirations and then attempt to satisfy these aspirations by using available resources (Perry, Chandler, & Markova, 2012). Effectuation is characterized by remaining flexible, learning by doing, and exploiting environmental contingencies as they arise rather than setting clear goals. According to Sarasvathy (2001), causation and effectuation fundamentally refer to cognitive processes, but related behavioral principles also exist (see Table 1). However, attempts to develop a measure of effectuation have shown that the behavioral principles of effectuation are not necessarily correlated (see Perry et al., 2012), suggesting that reliance on effectual reasoning may differ in different contexts and organizations.

While effectuation theory emerged to explain entrepreneurial decision-making, researchers also find evidence of effectual reasoning among managers and in larger firms. For example, Helmersson and Mattsson (2013) posit that causation and effectuation orientations are generic characteristics of managers. Additionally, Johansson et al. (2012) find that even some established and relatively large magazine publishing companies prefer effectual logic in their operations.

Reliance on effectual reasoning rather than causal reasoning is sometimes associated with the decision-makers' characteristics, such as entrepreneurial expertise; however, most often, such reasoning is related to environmental uncertainty (Chandler, DeTienne, McKelvie, & Mumford, 2011; Read et al., 2009). The logic here is that uncertainty prevents or hinders causal reasoning, and therefore, decision-makers

Table 1
Five behavioral principles of causation and effectuation (adapted from Read et al., 2009).

Issue	Causation	Effectuation
View of the future	**Predictive view of the future:** Considering the future a predictable continuation of the past. A firm can align its actions with predictions.	**Creative view of the future:** Considering the future uncertain and unpredictable. A firm can creatively take actions that shape the future.
Basis for taking action	**Goal-based action:** Beginning with a given goal	**Means-based action:** Beginning with a set of means
View of risk and resources	**Productivity view:** Focusing on expected returns	**Affordability view**: Focusing on affordable losses
Attitude toward outsiders	**Protective attitude:** Emphasizing competitive analysis and protecting market share	**Cooperative attitude:** Emphasizing partnerships and cooperative strategies
Attitude toward unexpected events	**Avoidance of potential threats:** Avoiding unexpected events and minimizing their impact	**Quest for potential opportunities:** Leveraging and transforming unexpected events into new opportunities

use effectual reasoning. For example, Yang and Gabrielsson (2017) argue that in the case of environmental uncertainty, causation logic is difficult to apply. This uncertainty may arise from constrained resources, rapid changes in the market, and the complexity of decision-making. Thus, the literature appears to assume that firms and decision-makers attempt to rely on causation logic but are sometimes forced to rely on effectuation logic because of environmental contingencies.

This observation implies that the reliance on effectuation may, in fact, be temporal in nature. According to effectuation theory, effectual reasoning is emphasized during the early stages of venture creation, but the emphasis subsequently shifts toward more causal strategies (Berends, Jelinek, Reymen, & Stultiëns, 2014; Perry et al., 2012; Sarasvathy, 2001). Many scholars also find the co-existence of causation and effectuation (Johansson et al., 2012; Yang & Gabrielsson, 2017).

3.2. Organizational adoption of technologies

Technological development is generally considered a source of competitive advantages. Consequently, the issue of how organizations attempt to take advantage of new technologies has received vast attention among scholars in business studies. New technologies may enable the renewal of entire business models (e.g., D'Ippolito, Messeni Petruzzelli, & Panniello, 2019) and the development of new products or services (Ardito et al., 2015) or could improve the effectiveness and efficacy of operations within a firm (Martins, Oliveira, & Manoj, 2016). The literature streams concerning innovation management and research and development typically tackle issues related to business model renewal, innovation performance, and new product/service development. In turn, information systems research has greatly contributed to studies concerning the adoption (or acceptance) of technologies that affect the effectiveness and efficacy of firms' operations. Since we perceive MA as a technology that may improve the effectiveness and efficacy of marketing operations, we primarily rely on the technology adoption models in the information systems literature. In the following, we discuss the causal reasoning underlying existing technology adoption models and present traces of effectual reasoning that have been found in empirical research. In particular, we focus on empirical studies conducted in the context of marketing technologies, such as customer relationship management and sales force automation.

Most theoretical models of the organizational adoption of technologies focus on the antecedents and consequences of the adoption decision. This literature stream features widely known theories, such as the technology acceptance model (TAM) (Davis, 1989), its extensions TAM2 (Venkatesh & Davis, 2000) and TAM3 (Venkatesh & Bala, 2008), the theory of planned behavior (TPB), the unified theory of acceptance and use of technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003), and its extension UTAUT2 (Venkatesh, Thong, & Xu, 2012). While these models investigate adoption decisions at the individual organizational member level, Oliveira and Martins (2011) identify the following two main models that examine the antecedents and consequences of technology adoption decisions at the firm level: Rogers' (1995) diffusion of innovations (DOI) model and Tornatzky and Fleischer (1990) technology-organization-environment model (TOE).

A common characteristic of all technology adoption models mentioned above is that the adoption phenomenon is delimited to a choice determined by a set of preceding factors (i.e., antecedents). The rationale is that by ensuring that the antecedents support the adoption of a given technology, the adoption choice leads to perceived benefits of technology (e.g., Kuan & Chau, 2001; Lin & Lin, 2008; Oliveira & Martins, 2010) or relative advantages of technology (e.g., Chong, Lin, Ooi, & Raman, 2009; Thong, 1999). Thus, the models suggest that technology adoption is a decision made after a rational evaluation of its antecedents. If the antecedents are in favor of the adoption decision, the consequences are predictable and positive for the organization. Clearly, such a linear view of adoption assumes causal reasoning and understates the longitudinal and complex nature of the adoption phenomenon.

The second stream of models perceives adoption as a process rather than a choice. The various process models vary in their level of detail and definition of the adoption stages. For example, Del Aguila-Obra and Padilla-Meléndez (2006) define six stages (i.e., initiation, adoption, adaptation, acceptance, routinization, and infusion), whereas Damanpour (1991) bundles the process into two stages: initiation and implementation. These models conceptualize the adoption stages as organizational activities required for adopting technology but do not discuss the mode of reasoning (i.e., effectuation or causation) that guides the adoption process. Specifically, we build upon Damanpour's (1991) two-stage model of initiation and implementation because the broadly defined stages allow more flexibility in our qualitative inquiry (Dubois & Gadde, 2002, 2014).

The initiation stage covers activities related to problem perception, information gathering, attitude formation and evaluation, and resource attainment leading to the decision to adopt (Damanpour, 1991). In the context of marketing technologies, the dominant view regarding initiation highlights the importance of rational and strategic thinking and, thus, causal reasoning. For example, many scholars argue that realizing the full potential of a sales force automation technology requires the adoption to be initiated by a strategic goal or business problem (Erffmeyer & Johnson, 2001; Honeycutt, Thelen, Thelen, & Hodge, 2005; Nguyen, Sherif, & Newby, 2007). A typical strategic goal for an automation system is to improve productivity by saving time and increasing sales and profits (Buehrer, Senecal, & Pullins, 2005; Erffmeyer & Johnson, 2001; Ko, Kim, Kim, & Woo, 2008).

In reality, however, adoption is also commonly initiated as a mimetic movement rather than a result of rational and strategic thinking (Wright, Fletcher, Donaldson, & Lee, 2008). Erffmeyer and Johnson (2001) reveal that a typical purpose of having an automation technology is to automate as many things as possible. This line of reasoning implies that adoption is driven by a managerial perception that there is intrinsic value in automating things. A lack of strategic planning may lead to an adoption process that focuses on technological capabilities rather than the required organizational changes (Campbell, 2003; Wright et al., 2008). Accordingly, Hillebrand, Kok, and Biemans (2001) show that mimetic moves in adoption decisions jeopardize the benefits of the technology investment. They suggest that firms pay attention to

the motivation for adoption and warn managers against adopting a marketing technology only because competitors are using it or because it is recommended by trade journals and experts.

The implementation stage consists of actions related to modifications in the adopted technology, organization, initial utilization of the technology, and continued use once the technology becomes a routine feature of the organization (Damanpour, 1991). Most marketing research assumes that implementation unfolds as a rational process and focuses on the factors that affect implementation. Specifically, implementation is fostered by the perception that the benefits outweigh the effort needed to learn the use of the new system (Avlonitis & Panagopoulos, 2005; Bush, Moore, & Rocco, 2005; Homburg, Wieseke, & Kuehnl, 2010; Schillewaert, Ahearne, Frambach, & Moenaert, 2005).

On the other hand, studies have identified external factors that influence implementation, such as competitive pressure (Chong et al., 2009; Oliveira & Martins, 2010; Zhu, Dong, Xu, & Kraemer, 2006) and uncertainty and complexity related to the adopted technology (Frambach & Schillewaert, 2002). Del Aguila Obra and Padilla-Meléndez (2006) report that many organizations use outside consultants to compensate for the lack of managerial capabilities to implement new technologies. Ahonen and Savolainen (2010) report cases in which software implementation is started when the buyers of technology have only vague ideas of the target of the acquisition or lack the expertise to use the technology. This evidence suggests that the implementation of technology is not always characterized by goal-directed causal reasoning, but there are traces of effectual reasoning.

In conclusion, the extant models of technology adoption assume that both the initiation and implementation stages of the adoption process follow causal reasoning. However, findings compatible with effectual reasoning during both the initiation and implementation stages have started to accumulate. Accordingly, we assume that both modes of reasoning may occur in the organizational adoption of new technologies. Fig. 1 illustrates the research framework of the present study, which is based on a literature review of the characteristics of MA technology, effectuation theory, and organizational adoption processes of new technologies. The framework describes the potential manifestations of causal and effectual reasoning in the adoption of MA during the initiation and implementation stages. The framework serves as a basis for analyzing our empirical data.

4. Methodology

4.1. Research strategy

This study employs the case study approach as its research strategy. According to Eisenhardt (1989, p. 534), “the case study is a research strategy that focuses on understanding the dynamics present within single settings.” Thus, the case study is a preferable method for examining contemporary real-life settings in which the dynamics between phenomena and contexts are not evident (Yin, 2014). Case studies are particularly well suited to capturing the knowledge of practitioners and developing theories from it (Benbasat, Goldstein, & Mead, 1987; Dubois & Gadde, 2002; Halinen & Törnroos, 2005).

In this study, the ‘case’ refers to the adoption of MA software. The case is contemporary because it represents an emerging phenomenon that has not been extensively studied. The case study approach was selected because it allowed us to generate an in-depth understanding of the phenomenon and to examine organizational dynamics in real-life settings. Specifically, we decided to conduct a comparative multiple-case study to corroborate the findings from individual settings and to therefore develop a more elaborate theory. Eisenhardt (1991) argues that by tying together the complementary aspects and patterns from individual cases, the researchers can draw a more complete theoretical picture; a good theory is the result of rigorous methodology and comparative multiple-case logic.

4.2. Case selection

In case study research, the cases are chosen for theoretical, not statistical, reasons (Glaser & Strauss, 1967). *Theoretical sampling* in case studies is advocated for pragmatic reasons; a researcher can thoroughly study only a limited number of cases, so one must choose cases in which the topic of interest is transparently observable (Pettigrew, 1990). In a similar line of reasoning, Eisenhardt (1989) suggests that the goal of theoretical sampling is to choose the cases that are likely to replicate or extend the emergent theory. Theoretical sampling is closely related to *purposeful sampling* in which the cases are strategically selected on the basis of their information richness and usefulness with regard to the research phenomena (Patton, 2002).

The selection of cases in this study was informed by theories, but because the MA research was at an embryonic stage at the time of selecting cases, it was difficult to foresee the exact theory that would best suit the purposes of this study. Consequently, we relied on *purposeful sampling* and selected cases on the basis of their potential for producing rich information about the adoption of MA. In alignment with the goals of this study, we specifically selected large-sized B2B firms that had moved beyond the initiation phase of MA adoption and provided us with generous access to collect data. In total, we ended up with four individual cases that fit the selection criteria. Four cases are considered an appropriate and manageable number of cases for developing elaborate theories (Eisenhardt, 1989).

All selected case companies are manufacturers of industrial products and services. These companies are headquartered in Finland but represent multinational companies that serve global markets with significant market shares. All companies were established multiple decades ago; thus, they have a lengthy experience with various technology adoption processes. Due to the various existing technologies within their organizations, the adoption decision regarding new technology must also be evaluated in light of the existing information systems architecture. The firms represent different industry sectors and differ in terms of how much time has passed since the initiation of MA adoption, enabling us to examine the phenomenon at different stages of the adoption process. Moreover, the firms have adopted different MA software, allowing us to investigate whether the selection of a specific MA software affects the adoption process. For confidentiality reasons, the companies are identified using pseudonyms in this study (Table 2).

4.3. Data collection

Theory development researchers are advised to triangulate data (Dubois & Gibbert, 2010; Eisenhardt, 1989), and thus, we combined several data collection methods. First, we conducted interviews with the key informants of each case company (i.e., marketing managers responsible for MA adoption). The interviews were semi-structured in nature and addressed managerial reflections on how the MA adoption process had evolved from initiation to the current stage of system usage. While we were particularly interested in the reasoning behind MA usage at different stages of the adoption process, we allowed the interviews to take unplanned directions so that the interviewees could raise any issues they found important with regard to the topic. The interviews were audio-recorded, and their length varied from 40 to 70 min.

The second source of data was discussions with partners and consultants that had been involved with the case companies' MA adoption processes. These discussions enabled us to obtain external perspectives on how the adoption processes had truly evolved. Third, to improve our general understanding of the MA adoption phenomenon, we visited three MA experts with experience with various MA adoption processes and discussed the key issues and commonalities that they had with the companies over the course of MA adoption processes. Finally, we made observations of the automated digital marketing activities that the case companies were performing. These observational data enabled us to

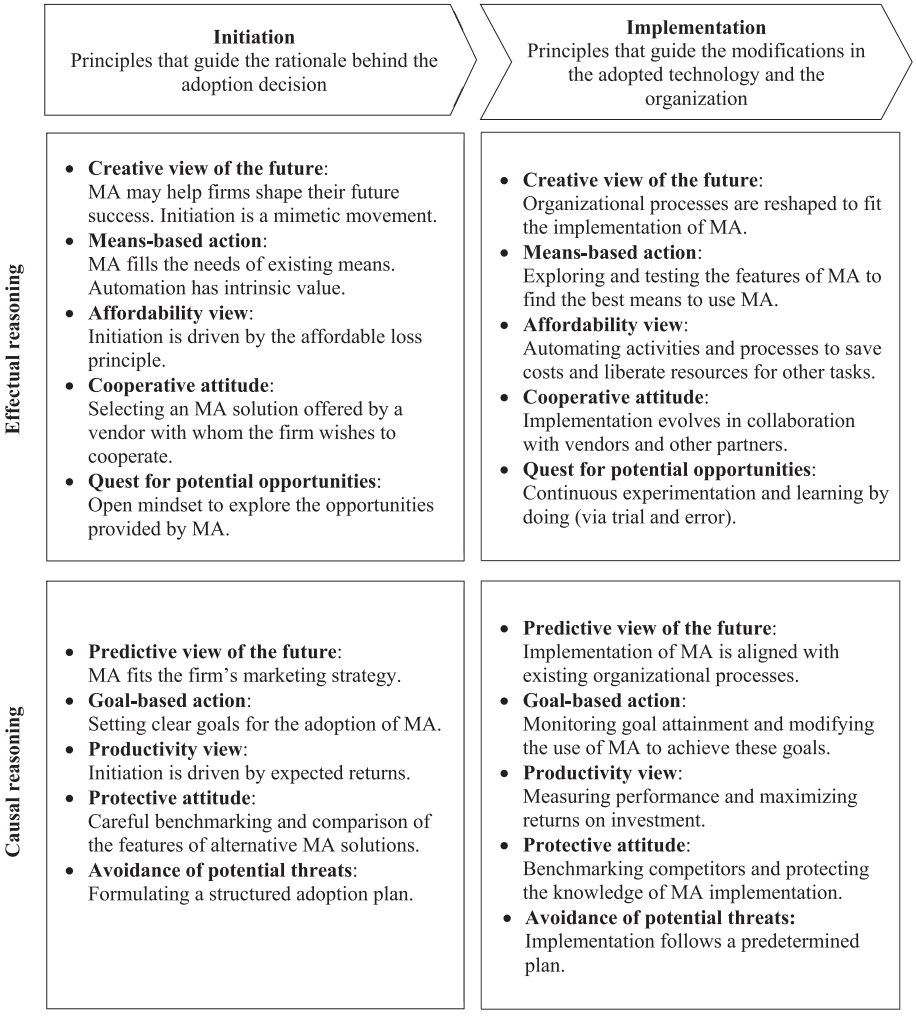

Fig. 1. Study framework: alternative reasoning modes in the adoption of MA.

familiarize ourselves with the perspective of customers as a recipient of automated marketing activities. Overall, the use of multiple data collection modes led to a rich and triangulated dataset. On the one hand, the data sources complemented each other and allowed us to draw a more complete picture of the adoption phenomenon. On the other hand, the sources corroborated the findings, fostered the identification of common patterns and significantly improved the internal and external validity of our findings (Table 3).

4.4. Data analysis

The transcribed interview data and notes from discussions and observations were accumulated into a unified case study database (i.e., data were integrated into a single NVivo project). The data analysis process followed an abductive logic, as it involved continuous matching between the data and theory in an attempt to develop existing theories. In this process of *systematic combining*, theoretical development and empirical analysis alternate, as the case is constantly matched with the developing theoretical framework (Dubois & Gadde, 2002, 2014). Thus, the analysis involved multiple cycles until we were able to match the

Table 2
Case companies and key informants.

Pseudonym	Delta	Epsilon	Sigma	Zeta
Industry/sector	Energy and marine	Industrial and environmental measurement	Minerals and metals	Welding
Revenue (USD)	> $5 billion	> $300 million	> $1 billion	> $100 million
Profit (USD)	> $400 million	> $30 million	> $10 million	> $10 million
Number of employees	> 15,000	> 1500	> 4000	> 500
Year of marketing automation (MA) adoption	2014	2007	2016	2015
MA software in use	Pardot	Eloqua	Click-Dimensions	Marketo
Key informant(s)	Communications and branding manager	Marketing technologist	Marketing director	Marketing director & digital community manager

Note: Revenue, profit and employee data are based on financial statements for 2017. The numbers are not meant to be accurate but to provide an approximation of the firm size.

Table 3
Data sources and their roles in the study design.

Data source	Role in the study design
Key informants	The interviews with key informants consisted of managerial reflections regarding how the MA adoption process evolved from initiation to the current stage of system usage. The data included the main events, decisions, challenges and learning during the adoption process. In particular, the interviews focused on the reasoning behind the decisions and, thus, offered in-depth insight into the use of effectuation and causation logic at different stages of the adoption process.
Partners and consultants	The discussions with the partners and consultants who were involved with the MA adoption process of the case companies were designed to provide different perspectives regarding adoption processes. Notably, the discussions were largely consistent with the interview data and, thus, corroborated the findings and improved the internal validity of the interviews.
External MA experts	The discussions with the external MA experts were designed to compare the selected cases with broader knowledge regarding how MA adoption processes evolve outside the context of our study. The discussions supported the interview data and improved the external validity of the findings and empirical framework.
Observations	The observations of the automated digital marketing activities enabled us to become familiar with the perspective of the customers as the recipients of the automated marketing activities. The observations contributed to our general understanding of the MA practices by the case companies.

data from individual cases with the final theoretical framework.

Despite the iterative nature of the analysis process, each cycle of analysis followed a systematic pattern that proceeded from within-case to cross-case analysis, as recommended by Eisenhardt (1989). In the within-case analysis, we wrote detailed case descriptions of each organizational setting. The goal was to find insights from each case as a stand-alone entity. Subsequently, the cross-case analysis involved taking divergent perspectives to examine the data and finding similarities and differences between the within-case analyses. Eventually, we ended up adopting a dual perspective to analyze the data. The first perspective was based on identifying key domains of MA adoption, and the second perspective focused on the chronological development of the reasoning behind MA adoption. After several iterations of within-case and cross-case analysis, we came up with a framework that closely fit the data of each individual case and explained how the reasoning behind adoption is reflected via the key domains of MA. To improve the internal validity of the framework, we used two investigators at each stage of the analysis. The use of multiple investigators also increased the creativity of finding patterns from data and added richness to the interpretations.

5. Results

The main finding of this study is that the balance between the use of effectuation and causation logics varies at different stages of the MA adoption process, but these shifts follow a systematic pattern across the individual cases. The initiation of MA adoption was found to be a highly effectual process that involved very little (if any) strategic planning. Instead, the adoption decisions were made under the uncertainty of potential benefits. In fact, the case firms reported that they knew very little about MA at the time of adoption. Epsilon and Delta were both planning to acquire new email marketing solutions but were eventually persuaded to purchase an MA system. Zeta and Sigma considered MA a growing trend in marketing and felt that MA could create competitive advantages in the future. The following quotes further illustrate the cooperative attitude and means based action principles characteristic of effectual reasoning during the initiation phase:

"I like to think that we were not selecting a tool but a partner, and the tool came with it. When a company starts like us with no experience, it's all about the people. Vendors need to start to work with us as partners from the first second on." (Zeta)

"We kind of realized that this MA tool fills the basic needs that we have at the moment and gives us the opportunity to get started really quickly." (Sigma)

While the initiation of MA was found to be rapid and straightforward, the implementation of MA involved a much more complex pattern. Overall, the study data revealed three sequential stages in the adoption of MA labeled 1) *sensemaking*, 2) *structuring*, and 3) *reforming*. The sensemaking stage was dominated by effectuation because the firms literally attempted to make sense of the MA usage by performing ad hoc experiments. During the structuring stage, the reasoning shifted from effectuation to causation; the firms had gained sufficient experience with MA and adopted a more structured approach to the use of MA by setting goals and aligning the usage to formal processes. While Sigma was still at the sensemaking stage and Delta focused on structuring the MA usage, Epsilon and Zeta had reached a point at which the use of MA followed a highly causal logic and the advances in MA usage became less significant, as they occurred via the incremental optimization of existing processes. Subsequently, Epsilon and Zeta progressed to the *reforming stage* and realized the need to reform the causal processes with an effectual approach to achieve further productivity leaps in the use of MA.

In addition to the stages of MA adoption, we identified five key domains of MA (i.e., customer knowledge, information systems infrastructure, analytics, interdepartmental dynamics, and change management) that played a crucial role in the adoption processes of the case companies. By matching the adoption stages and domains of MA, we created a maturity model (Fig. 2) that illustrates how the effectuation and causation modes vary across the adoption stages and are reflected in the domains of MA. Simultaneously, the model shows the current adoption stage of each case firm. In the following, we explain the details of the model.

5.1. Sensemaking stage

5.1.1. Customer knowledge: exploring digital footprints

The case firms' acquisition decisions regarding MA software were influenced by the notion that customers increasingly use digital channels in their purchasing processes. To be able to react to the digitalization of customer behavior, the MA was needed to learn more about customers' digital footprints. Typical web analytics had previously enabled the firms to track aggregated visitor behavior, but MA advanced their ability to identify visitors and track their behavior over time.

"We can actually understand better the whole digital footprint of customer by employing an MA platform, and we started from there." (Sigma)

5.1.2. Information systems infrastructure: MA as a separate entity

All case companies realized the need to integrate MA software with CRM before the acquisition decision. In the beginning, however, the case companies were focused predominantly on MA features and the types of data that the system produced. The use of MA as a stand-alone system was sufficient in the beginning, as the firms were making sense of MA functionalities.

5.1.3. Analytics: learning from data

The use of analytics focused on learning from the data produced by the MA software. The case firms examined the results of the MA activities via ad hoc metrics (e.g., open rates and click-through rates). Bad results were not necessarily bad news, but they were treated as opportunities to learn and make improvements.

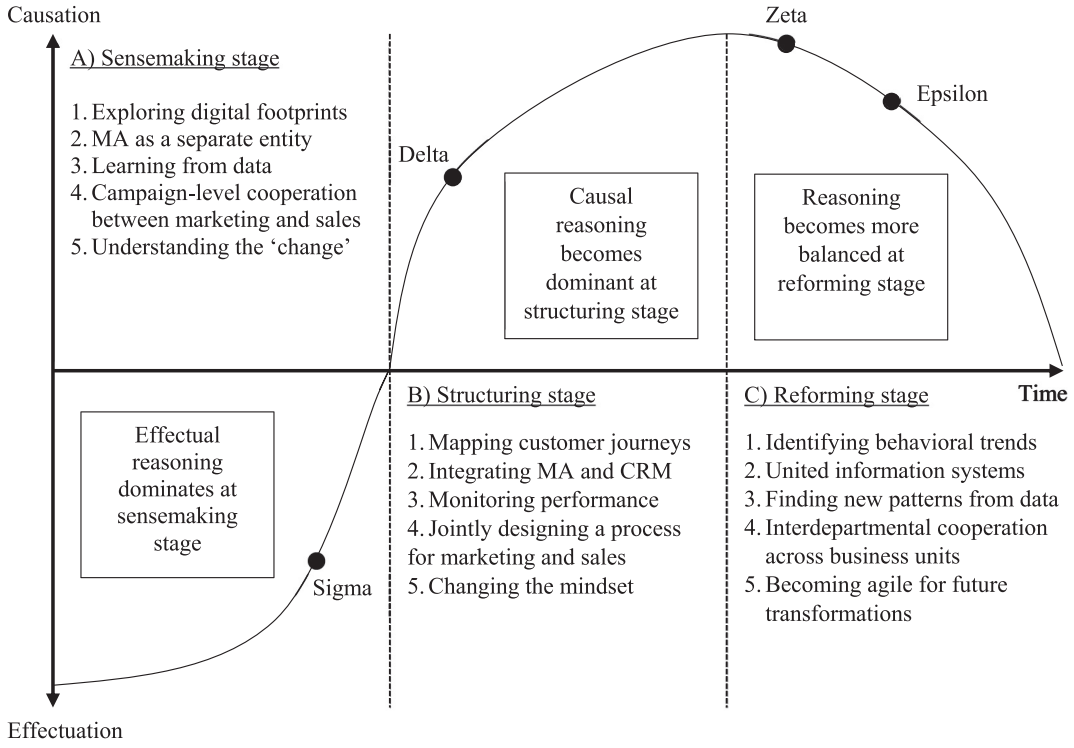

Fig. 2. Maturity model of MA adoption.
Notes: The numbers at different stages refer to specific MA domains; 1. Customer knowledge, 2. Information systems infrastructure, 3. Analytics, 4. Interdepartmental dynamics, and 5. Change management.

5.1.4. Interdepartmental dynamics: campaign-level cooperation between marketing and sales

The marketing departments of the case firms soon realized that the benefits of MA could be limited if sales did not seize the sales lead opportunities generated by the marketing activities. Thus, the case firms began to explore actionable ways to tighten the collaboration between marketing and sales via ad hoc campaigns and individual actions. The firms even felt that collaboration could not have been achieved without the MA software.

"The technology is an enabler for handshakes; it doesn't go the other way around. First you get the tool, and then you realize that this doesn't work if these two guys don't talk to each other. But that's the most difficult part of marketing automation adoption. To get marketing and sales to work for the same goal." (Delta)

5.1.5. Change management: understanding the 'change'

To be able to manage change, one needs to understand the change that the firm desires. Therefore, the case firms' implementation of MA began by building a basic understanding of how MA works and what types of skills are needed to use it. The firms reported that they had begun the process with the automation of very simple tasks, as they aimed at finding relevant use cases and executing ad hoc campaigns enabled by MA. Sigma's first year with MA involved continuous learning by doing while simultaneously making an effort to modernize the way the company thinks about marketing as a whole.

5.2. Structuring stage

5.2.1. Customer knowledge: mapping customer journeys

Once Epsilon and Zeta had gained a sufficient understanding of the customers' digital footprints and tested behavioral responses to various marketing activities, they began to match the use of MA with the customer journeys of distinctive customer segments and buyer personas. The goal was to enable the firms to lead (rather than follow) customers from the need awareness stage to the point of purchase and beyond. Many study participants mentioned that the ideal was to deliver the "right message at the right time to the right customer" and thus improve the customer experience. Sigma and Delta were also planning to move into this direction once they had gained a better understanding of their customers.

"We focus on which phase of the marketing and sales funnel the customers are and which message is the best one for them and at what time." (Epsilon).

5.2.2. Information systems infrastructure: integration of MA and CRM

It was soon realized that analyzing data from one system produces a narrow picture of customer behavior and marketing outcomes. To be able to support the customer journeys mapped and to automate the sales lead handling process, the firms began to work on integrations between MA and CRM that would foster the data flow and increase visibility between the two systems. Delta found the integration between MA and CRM somewhat painful, while the other firms had not encountered major challenges. It became clear that a firm should consider the compatibility of MA to other information systems before the acquisition decision.

5.2.3. Analytics: monitoring performance

As the adoption of MA progressed, the firms took more systematic approaches to the use of analytics and performance measurement. In addition to monitoring individual campaign results, Delta created a metrics system of key performance indicators for its MA usage based on selected business goals. Zeta highlighted the importance of a systematic monitoring and reporting system in their use of MA because it enabled them to communicate the value of marketing to top management. Epsilon had managed to build a lead scoring model for classifying potential customers and transferring them to sales, while others were still in the process of building such models. The firms also discussed the opportunity to create attribution models to obtain a more accurate view

of marketing results.

5.2.4. Interdepartmental dynamics: jointly designed process for marketing and sales

After probing the collaboration between marketing and sales, the case companies began to build systematic processes for the collaboration. While Sigma was still examining the modes of collaboration, Delta and Zeta had managed to standardize the interactions between the two functions. Epsilon was clearly ahead of the other case firms, as it had created a joint marketing and sales funnel with common objectives and metrics. Moreover, the functions had regular meetings in which they discussed the development ideas and shared feedback with each other.

5.2.5. Change management: changing the mindset (and winning resistance)

When the case firms were able to define the change that they wanted to achieve, the next challenge was to transform employees' mindset in terms of how marketing and sales should be conducted. Because people are generally reluctant to change, winning resistance via training and communicating the importance of change became crucial. In this new mindset that the case firms were implementing, marketing was no longer about pushing products to customers but instead about being useful for customers. Marketing was also seen from a more strategic perspective; more time was allocated to planning, while the execution of marketing activities became automatic. For example, the campaigns were no longer static and periodical but dynamic and continuous; MA triggered the campaigns when a potential customer met predefined criteria.

"The biggest challenge is that it fundamentally changes how marketing should think. Marketing used to be all about reaching a wider audience. Now it's about decreasing the amount of eyes that are watching and tailoring the content for that particular group." (Delta)

5.3. Reforming stage

5.3.1. Customer knowledge: identifying behavioral trends (from external market data)

When the processes of leading customers on their purchasing journeys became more advanced and complex, the benefits of optimizing them proved less significant. While Epsilon and Zeta were still focusing on the optimization of customer journeys, they had begun to look for new types of data that could help them increase customer and market knowledge. Specifically, Zeta discussed the identification of industry trends and new behavioral patterns in specific market areas. They realized that instead of optimizing existing customer journeys, MA could be used for reaching new customer segments and sources of revenue.

5.3.2. Information systems infrastructure: united information systems

After the integration of MA and CRM software, Epsilon began to explore other information systems and data points that could be integrated into a holistic data warehouse. For example, they realized that their social media and webinar platforms and business intelligence systems produced diverse data that could be combined with MA and CRM. Zeta was also visioning further integrations by adding "everything that has data in it" into a united information systems infrastructure. Notably, higher volumes of data increase the value of data visualization. Integrating distinctive types of data and visualizing them in a meaningful way will require causal planning, as well as effectual experimentation and creativity.

5.3.3. Analytics: finding new patterns from the data

While the firms were focused predominantly on *structuring* their analytics and performance measurement systems, Epsilon was already beginning to face the challenge of increasing complexity in the use of analytics. Because MA requires the manual setting of rules and triggers on what is automated and when, the use of analytics becomes more laborious as the complexity increases. Epsilon realized that it needed to take totally new, creative and experimental perspectives on the use of analytics to make significant progress. Furthermore, machine learning was considered to enable Epsilon to shift from retrospective monitoring to making predictions and finding new patterns from the data. Other firms acknowledged the same trend but discussed it futuristically.

"*Over time, machines make better decisions than humans. From the statistical error point of view, machines will learn to be better and more consistent than humans are. In addition, they can monitor data in real time, which people can't really do. I guess it is a matter of finding the balance.*" (Sigma)

5.3.4. Interdepartmental dynamics: interdepartmental cooperation across business units

The case firms were occupied primarily by integrating marketing and sales processes, but the study data included seeds of innovative practices that Epsilon and Zeta were beginning to experiment. The next step would be integrating other functions, such as operations and product development, into the same chain of automated processes. This development mirrors the movement toward a united information systems infrastructure.

5.3.5. Change management: becoming agile for future transformations

Automation is not performed at once but is part of a constant movement toward greater intelligence in marketing. Therefore, the firms felt they had to prepare themselves to transform when the automation advanced. The world is unpredictable, and even if firms have rock-solid structures and processes, they need to be able to adapt to new developments in technology. Zeta and Epsilon realized that MA would offer new ways to conduct marketing in the future, and they were thinking about how to prepare organizations to be agile in the face of future transformations.

"Automation is a development path that continues forever. We have to be really 'antennas up' to know what's coming." (Zeta)

6. Discussion

The main findings of this study show that large and established B2B firms use both causal and effectual reasoning when adopting MA software and that the dominant mode of reasoning varies over the course of the adoption process, but this variation follows a similar evolutionary path in all case companies. These findings have important implications for theory development, managerial practice and future research avenues.

6.1. Theoretical contributions

As its first contribution, the study provides conceptual development of the organizational technology adoption models (e.g., Frambach & Schillewaert, 2002; Rogers, 1995; Tornatzky & Fleischer, 1990). Despite their indisputable merits, the current models do not distinguish between decision-making logics but implicitly assume that all organizations follow causal reasoning throughout the adoption process. That is, the organizations are treated as rational entities that evaluate adoption as a product of perceived benefits, organizational characteristics and environmental influence. Equipped with sufficient knowledge and resources, the causal organizations can follow a goal-driven and carefully planned adoption process. Against this view, we observed that all four case companies in this study initiated MA adoption with a heavy emphasis on effectual reasoning. They had a common belief that MA will improve marketing performance in the end but were uncertain about how MA would actually be implemented within organizational processes. They felt it was difficult to set accurate objectives or make plans to adopt the technology, so they decided to make a quick adoption decision and learn the logic of the new technology by using it. Thus, this study concludes that the current knowledge on technology

adoption does not universally explain how organizations approach adoption processes at the digital age and adds reasoning modes (causal vs. effectual) as a new analytical layer to examine the phenomenon. This addition also complements earlier evidence against the view of technology adoption as a rational choice or process (Makkonen, Johnston, & Javalgi, 2016; Makkonen, Olkkonen, & Halinen, 2012).

As its second contribution, this study developed a maturity model that presents technology adoption as a longitudinal phenomenon in which the dominant mode of reasoning varies over time and is reflected as a tendency toward structuring (i.e., causation) or reforming (i.e., effectuation) the activities related to adoption. The model is largely in line with the existing theory postulating that effectuation is emphasized in the early stages of venture creation and that the emphasis is then shifted toward causal reasoning (Berends et al., 2014; Perry et al., 2012; Sarasvathy, 2001). The novelty of the maturity model relates to the idea that the variation is not one-directional from effectuation in the early stages of the adoption to causation in the later stages. Instead, the model suggests that the dominant mode of reasoning follows an iterative pattern in which the adopting organization moves back and forth between the reasoning modes.

To the best of our knowledge, this study is the first to provide empirical support for the dynamic nature of reasoning between effectuation and causation in technology adoption processes. Nevertheless, the variation between effectuation and causation during different phases of the MA maturity model (i.e., sensemaking, structuring and reforming) parallels the theory of dynamic capabilities (i.e., sensing, seizing and transforming; Teece, 2007; Teece, Pisano, & Shuen, 1997). The dynamic capabilities theory (Teece et al., 1997) and effectuation theory (Sarasvathy, 2001) share the fundamental assumption that a firm's environment is unpredictable and creates situations of uncertainty. Under uncertainty, organizations must react to changes in the environment faster than their competition by taking advantage of unexpected opportunities and transforming existing organizational processes and operations accordingly. Similar to our maturity model, we argue that the dynamic capabilities theory implicitly encompasses the idea of iterative fluctuation between the causal structuring of organizational processes and their effectual reforming. Specifically, Teece's (2007) description of sensing market opportunities under uncertainty is clearly linked to the effectual sensemaking stage in the MA maturity model in which the organization explores the opportunities of MA and determines the required organizational change. During the seizing stage, the firm capitalizes on market opportunities by creating structures and processes (Teece, 2007), which fits the causal structuring stage of the MA maturity model, which involved building a formal process for the usage. Finally, the transforming stage involves the reconfiguration of structures and processes to maintain the evolutionary fitness of the firm (Teece, 2007), which is related to balanced reasoning during the reforming stage of the MA maturity model, which involves innovating and experimenting with changes to the existing structures and processes. Thus, the finding that the reasoning modes follow an iterative pattern during technology adoption is supported by the dynamic capabilities theory.

The third contribution of this study is specific to the emerging stream of MA literature. The adoption of MA was proven to be a complex process that culminates in the persistent development of five key domains identified in this study: customer knowledge, information systems infrastructure, analytics, interdepartmental dynamics, and change management. These domains are in harmony with the study by Järvinen and Taiminen (2016), who find that the successful use of MA requires a transformation in the marketing mindset, greater focus on analytics and seamless collaboration between marketing and sales. However, this study adds to this knowledge by creating an explicit taxonomy of MA domains and demonstrating their evolution at different stages of the adoption process. Furthermore, while Järvinen and Taiminen (2016) show how a B2B organization may take advantage of MA in a highly organized (i.e., causal) manner, this study shows the path that B2B organizations take in building such structures and reforming them.

6.2. Managerial implications

The findings of this study imply that managers should balance effectual and causal reasoning when adopting new technologies. On one hand, effectual reasoning helps managers make technology adoption processes faster and more agile via continuous experimentation and learning by doing. On the other hand, causal reasoning helps managers create structures and processes that enable the firm to scale up and routinize learnings from experiments. Our suggestion for a 'balanced approach' is in line with Brinker's (2019) recent discussion of the urgent need to find middle ground between two extreme models of technology adoption, namely, 'waterfall' (i.e., a highly causal and strategic approach) and 'agile' (i.e., a highly effectual and experimental approach). Brinker argues that technology adoption is not about being either agile [effectual] or strategic [causal]; it is about blending and adapting these two approaches for a specific 'job-to-be-done' that creates business value. Our results enrich this perspective by showing that firms may need different blends of agility [effectuation] and strategic thinking [causation] at different phases of the adoption process.

In the beginning of the adoption process, effectual reasoning is essential for companies to create competitive advantages in today's fast-changing business environment. As Andriole (2018, p. 4) puts it, "we live in a different world in which speed matters more than precision, and there's no going back. In this world, the new best practices are to move fast, adopt early, and experiment widely". Accordingly, our results encourage managers to avoid excessive specification of technology projects and make quick adoption decisions. By starting with pilot use cases, the firm is able to test technology faster and thus learn faster. This type of trial-and-error learning is often a much more effective way to explore the benefits of a new technology than trying to foresee these benefits beforehand. In particular, when the cost of acquiring a technology is low (e.g., cloud software), it may be significantly more costly to use resources for detailed planning than to simply acquire the technology and test whether it matches the needs of the company.

Although effectual reasoning is preferable in the early phase of the adoption process, it may lead to a series of ad hoc experiments and isolated pilot use cases that have only marginal business value in the long run. Therefore, when experience with the technology begins to accumulate, the firm should move on to a more causal mode and scale up the learnings from pilot use cases to more extensive and strategic implementation. In practice, the firm needs to set clear goals for implementation, secure the required resources and capabilities, and design processes and workflows to support the effective use of the technology. This is a difficult phase because it usually involves changes in the organizational structures and ways of working. Change resistance may occur, and success calls for change management and leadership. Partners and collaborators that have more expertise with implementation may be very helpful to overcome the potential technical and managerial hurdles. Once the processes and workflows are in place, the company may improve productivity for some time by simply optimizing and making incremental improvements to them. However, when optimization efforts reach a saturation point and productivity growth becomes flattened, it is time to take steps back toward effectuation. In the balanced approach of effectuation and causation, the firm continues to harness existing structures and processes but simultaneously innovates new use cases and experiments to avoid stagnation. Successful use cases create new scaling opportunities that lead to new cycles of restructuring causal processes and workflows.

In terms of MA adoption, the study finds that firms should emphasize five specific domains. First, customer knowledge is the ultimate resource for the use of MA. Thus, a firm should make an effort to understand customers' digital footprints and the underlying motivations for their behavior. Customer knowledge enables the firm to map

customer journeys and create meaningful content for different phases of those journeys. Second, information systems infrastructure must be integrated so that the MA is synchronized with CRM and other systems to create a holistic picture of customers and company operations. The ideal is to create a unified database that allows easy access to the 360-view of customers. Third, we recommend that firms harness analytics to make data-driven decisions and optimize marketing performance. However, we remind managers that excessive optimization based on internal data on existing customer behavior and campaign results may lead to firm-centric marketing myopia. That is, by focusing on retrospective data on what already has occurred, the firm may lose sight of the new opportunities and threats that the changing business environment induces. Therefore, managers should broaden their views and look for external market data to identify new market trends and business opportunities.

Fourth, it is vitally important to align marketing and sales to work for the same objectives. Thus, managers should unify marketing and sales processes and consider providing joint incentives from positive sales results. Notably, alignment between sales and marketing operations is a vital step forward, but it may not be enough for companies that are committed to creating excellent customer experiences. Engaging customers with seamless experiences requires organization-wide collaboration between marketing, sales, customer support, web services, IT and all other functions that have customer-facing interfaces. Fifth, change management and leadership are essential for the development of the other four domains. Managers must implement a 'customer-first' mindset that emphasizes value creation for customers rather than selling goods for profit. Furthermore, balancing causation and effectuation requires continuous cycles of structuring and reforming MA processes, and thus, managers must foster a curious mindset that is always open to changes.

6.3. Limitations and future research

As in almost all cases studies, this study is limited in terms of its statistical generalizability (Dubois & Gibbert, 2010; Yin, 2014). The study investigated the adoption of a single technology (i.e., MA) in the context of four industrial B2B organizations; this approach clearly does not allow us to claim that the study results are transferable to all types of technology adoption processes. Instead of seeking statistical generalizability, most case studies aim to achieve analytical generalizability, which refers to the extent to which the empirical observations are generalizable to theory, rather than to a population (Yin, 2014). The findings of this study are largely generalizable to effectuation theory and corroborate previous research results that have applied effectual reasoning in the context of technology adoption (Alford & Page, 2015; Johansson et al., 2012). However, the effectual view of technology adoption does not reflect the general understanding of technology adoption processes. This observation raises questions that call for further research.

The contradiction between our findings and technology adoption literature may be explained by specific circumstances of this study and the absence of reasoning modes in previous literature. Specifically, we assume that specific technology adoption circumstances lead to different modes of reasoning that cause different types of adoption processes. The question is, what types of circumstances lead to different reasoning modes? Based on this study, we propose that many of these circumstances relate to the technology being adopted. First, the novelty of technology is likely to cause uncertainty, which leads to a more effectual adoption process. Second, the initial cost of technology acquisition may have implications for the reasoning mode; as the cost of technology increases, the more eager the organization is to find causal reasons for the adoption. Third, the reasoning mode may differ between situations in which firms develop technological solutions in-house (Ardito et al., 2015) and situations in which firms acquire such solutions from the market (e.g., Ardito et al., 2018; Natalicchio et al., 2014). Fourth, the extent to which technology requires changes to existing organizational processes may influence the choice of the reasoning mode; if the technology fits the existing processes, causal planning and implementation are more feasible. In addition to the characteristics of the technology being adopted, the resources available and organizational culture may influence the reasoning mode. For example, the firms that are inclined toward first-mover advantages are likely to rely on effectuation, while other firms are more risk-averse and wait until they have sufficient knowledge to adopt a new technology with causal reasoning. Clearly, more research is needed to investigate the circumstances that influence an organization's reasoning mode and the consequences of different reasoning modes for the adoption process.

Finally, the maturity model of MA adoption resembles the theory of dynamic capabilities (i.e., sensing, seizing and transforming; Teece, 2007; Teece et al., 1997) in terms of how the MA domains develop during the adoption process. Future research could investigate how MA and other marketing technologies can enhance firms' capabilities to sense and seize new market opportunities and transform existing processes. Recent research has already investigated the role of information technology-enabled dynamic capabilities in competitive performance (Hwang, Yang, & Hong, 2015; Mikalef & Pateli, 2017). This research represents a promising stream of literature that could be extended to the field of industrial marketing.

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