Decision-making as a microfoundation of dynamic capabilities:

The role of intuitive and rational process

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Résumé :

La littérature énonce deux grands modes de prise de décision, le mode rationnel et le mode intuitif. Certains auteurs soulignent que le développement des capacités dynamiques peut être favorisé par des équipes de direction composées de dirigeants ayant des capacités rationnelles et intuitives. Mais un seul dirigeant peut-il combiner ces deux modes de prise de décision ? Pour étudier les décisions prises par les dirigeants dans le cadre du processus de développement des capacités dynamiques, cette étude de cas longitudinale et rétrospective se focalise sur le cas de Steve Jobs dans ses rôles de dirigeant chez Apple et Pixar et sur deux capacités dynamiques, liées à la restructuration de l'entreprise (Apple et Pixar) et au développement de nouveaux produits (l'iPhone et Toy Story). A travers cette étude approfondie, nous proposons un nouveau point de vue sur les capacités dynamiques, qui pourraient être communes à toutes les entreprises gérées par un dirigeant unique ayant la capacité de combiner des décisions rationnelles et intuitives. Cette étude apporte trois contributions à la littérature sur les capacités dynamiques. Tout d'abord, elle montre que les capacités dynamiques peuvent être transversales à deux entreprises lorsque ces dernières sont gérées par un même dirigeant. Ensuite, cette étude souligne l'existence d'autres caractéristiques managériales qui jouent un rôle important dans le développement des capacités dynamiques : la personnalité émotive du dirigeant, l'état émotionnel et l'estime de soi. Enfin, l'étude permet de croiser la littérature sur les capacités dynamiques avec d'autres littératures : la littérature sur la prise de décision, l'intuition et l'émotion.

Mots-clés: capacités dynamiques, décision rationnelle, décision intuitive, émotion, microfoundation

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Abstract:

Prior literature defines two broad decision-making modes, rational and intuitive, and recommends establishing leadership teams staffed by leaders with both capacities, in support of firm efforts to develop dynamic capabilities. But can one single leader combine these two modes? To investigate decisions leaders make in the process of developing dynamic capabilities, the current longitudinal, retrospective, qualitative case study focuses on Steve Jobs in his leadership roles at Apple and Pixar and two dynamic capabilities, related to firm restructuring (Apple and Pixar) and new product development (the iPhone and *Toy Story*). With this in-depth assessment, the current study proposes a new view on dynamic capabilities, which might be common across firms managed by a single leader who has the ability to combine rational and intuitive decisions, such that it is possible for that leader to deal with the unique context of each firm. This study identifies some microfoundations linked to managerial characteristics that favor the development of dynamic capabilities, as well as combined rational and intuitive decisions, such as human managerial capital and managerial cognition. Other characteristics specifically favor intuitive decisions (e.g., emotional personality, emotional state, high self-esteem). Finally, this article integrates dynamic capabilities theory with insights from decision-making, intuition, and emotion literature.

Keywords: dynamic capabilities, rational, intuitive decision, emotion, microfoundation

Introduction

Dynamic capabilities (DCs) theory aims to explain how firms adapt successfully to changing environments (Nayak et al., 2020), or more precisely, how a company can achieve and maintain its competitive advantages in the face of rapid technological change (Peteraf et al., 2013). From a theoretical standpoint, DCs address some limitations of the resource based-view (Priem & Butler, 2001), which is too static to provide a satisfactory explanation of when competitive advantages remain, even in dynamic environments (Barreto, 2010; Wang & Ahmed, 2007; Wilden et al., 2016). From a practical perspective, the duration that competitive advantages last has diminished considerably over time, due to globalization, advanced technologies, and other trends (Barreto, 2010; Denrell & Powell, 2016), so firms must regularly renew their advantages by developing and introducing new products or services (Farzaneh et al., 2022). In so doing, companies must build successive, temporary advantages to maintain a certain level of performance over time (Barreto, 2010; Prange et al., 2018). That effort in turn requires them to develop DCs, which cannot be acquired in the market (Ambrosini & Bowman, 2009; Barreto, 2010; Donada et al., 2015; Schilke et al., 2018). That is, to maintain a competitive advantage, firms must modify their resource bases in response to changes in the environment; DCs facilitate these efforts to continuously modify their resources and skills (Ambrosini & Bowman, 2009).

Applications of DC theory have described the development of DCs (Pablo et al., 2007; Narayanan et al., 2009) or analyzed this development using a content approach that specifies its antecedents or enablers (Wilden et al., 2016), as well as a process approach that highlights the phases of DC development (Helfat & Peteraf, 2003; Donada et al., 2015). But decision topics are rare in discussions of DC development. As Teece (2007a) and Barreto (2010) establish, decisions are necessary to sense and seize opportunities, as well as reconfigure resource bases. Hodgkinson and Healey (2011) further specify that intuitive decision-making

in particular can increase sensing and seizing opportunities, such that organizations that incorporate intuition into their practices have an easier time identifying new opportunities than organizations that proceed solely through analytical approaches. Therefore, organizations likely benefit from integrating members with an analytical mode of reasoning together with members who adopt an intuitive mode of reasoning in decision-making teams. Beyond the team level though, certain leaders might possess the individual ability to combine rational and intuitive decisions, which also might be beneficial for their firms' DC development. The managerial characteristics required to develop DCs appear heterogeneously distributed among leaders (Helfat & Peteraf, 2015), such that it seems pertinent to try to identify which managerial characteristics support combinations of rational and intuitive decisions that can facilitate DC development. In this line, we formulate the following question: How do rational and intuitive processes intervene in the leader's decision-making process to develop dynamic capabilities? It is interesting to study one individual because in microfoundation literature, authors recognize the importance of understanding individual characteristics and behaviors to explain organizational phenomena (Felin & Foss, 2005).

With this approach, we offer three main contributions to DC literature. First, this research proposes a new understanding of DCs, by outlining how dynamic managerial capabilities (DMCs) might generate DCs that are common to multiple firms managed by the same leader. Each firm features a different context though, so this leader must be able to combine rational and intuitive decisions. Second, we identify managerial characteristics that favor the development of DCs. An emotional personality, the emotional state of the leader, and high self-esteem foster intuitive decisions; other characteristics, such human capital and managerial cognition, favor both rational and intuitive decisions. Third, this study demonstrates how to combine research into DCs with other literature streams, including decision-making, intuition, and emotions.

Dynamic capability development

A DC implies a capacity to sense opportunities, seize those opportunities, and transform the resource base (Teece, 2007a). In addition to enabling rapid, effective organizational responses to environmental turbulence (Wilden et al., 2016), DCs create change in markets (Fainshmidt et al., 2016; Wilden et al., 2016) and alter the competitive environment (Teece, 2014). As Bingham et al. (2015) highlight, a firm can create more value by developing multiple DCs than by focusing on any one DC in particular, because as a DC erodes over time, the firm must develop new ones to maintain its performance (Prange et al., 2018). In literature, several types of dynamic capabilities (DCs) have been studied, for example new product (Helfat, 1997; Kale, 2010) or service (Pablo et al., 2007; Zollo and Singh 2004) development, alliances (Kale and Singh 2007, Singh et al., 2007), or diversification (Doving and Gooderham, 2008). As noted, these DC developments have been studied on the basis of both process and content approaches.

From a process perspective, Teece's (2007a) well-known model distinguishes three DC phases: sensing, seizing, and transforming. Altintas et al. (2022) propose some microfoundations of the three phases. Other models propose a building model, regardless of the nature of the DCs. For example, Helfat and Peteraf (2003) highlight three phases (founding, development, and maturity) of any DC development. In studies that focus on the nature of the DC, Pablo et al. (2007) and Narayanan et al. (2009) specify separate service development and product development models; still other models refer to acquisition-based DCs (Mitchell et al., 2007) and relational DCs (Donada et al., 2015).

From a content perspective, extant studies emphasize the role of experience, organizational structure, culture, resources (Schilke et al., 2018), and information technology (Roberts et al., 2016), as well as learning (Zollo & Singh, 2004; Kale & Singh, 2007; Singh et al., 2007; Newey & Zahra, 2009; Bingham et al., 2015). Different learning mechanisms support

the building of DCs, which might be classified as experience accumulation, knowledge articulation, and knowledge codification (Zollo and Winter, 2002) or else as knowledge articulation, codification, sharing, and internalization (Singh et al. 2007). Bingham et al. (2015) focus on concurrent learning to explain the development of multiple DCs in parallel, which they argue requires microfoundations of knowledge codification and structures.

A content approach also tends to emphasize the role of managerial underpinnings (King & Tucci, 2002; Adner & Helfat, 2003; Teece, 2007a, b; Augier & Teece, 2008, 2009; Teece, 2012; Helfat and Martin, 2015), with the prediction that managers largely explain the development of DCs; dynamic managerial capabilities (DMC) are defined as "capabilities with which managers build, integrate, and reconfigure organizational resources and competences" (Adner and Helfat, p. 1012). Such a view moves beyond managers' operational activities (e.g., control, supervision, administration) and highlights their strategic functions (Teece, 2007b), which are indispensable in turbulent environments. Their fundamental strategic function is to orchestrate organizational assets (Teece 2007a; Augier and Teece, 2008). According to Teece (2007a), this function spans a three-step process: (1) identify (and create) new opportunities, (2) seize those opportunities, and (3) transform the resources. To undertake it, managers must have certain characteristics (Adner and Helfat, 2003), such as intrapreneurship and entrepreneurship, as well as a strong degree of foresight and business acumen (Teece, 2007b). In the literature, there is a stream of research on individual microfoundations to explain the development of DCs. Indeed, authors recognize the importance of understanding individual characteristics and behaviors to explain organizational phenomena (Felin and Foss, 2005). The origins of collective concepts lie at an individual level and are rooted in deliberate and intentional action (ibid). The microfoundations approach assumes that individuals and their interactions are essential to understanding organizations and social systems (Barney and Felin, 2013). Focusing on individuals as microfoundations can have certain virtues especially in

understanding organizational behavior and performance (ibid), the latter of which is regularly explained by the talent of certain organizational actors (Foss and Lindenberg, 2013). According to Felin and Foss (2005), in order to explain an organizational phenomenon, one must begin by understanding the individuals that comprise the organization. These constitute microfoundations of capabilities in two ways: (1) through their psychological characteristics and behaviors and (2) through their managerial characteristics and abilities (Felin et al., 2012). Thus, the psychological and behavioral sources originate in behavioral theory, which emphasizes that individuals make more or less informed and rational choices. In this sense, individual characteristics, such as choices and freedom of action, emotions (Hodgkinson and Healey, 2011), or cognition (Gavetti, 2005; Milano-Mayan and Rouby, 2019) are micro-foundations that can provide insights into collective phenomena such as routines and organizational capabilities. In addition, individuals may have different beliefs, goals, and interests that can affect their choices and explain the heterogeneity of firms. Regarding to managerial characteristics, individuals bring human capital (skills, knowledge, experience, cognitive abilities) to organizations that may differ from one individual to another. It is therefore differences in individual characteristics that explain the heterogeneity of organizational routines and capabilities (Felin et al., 2012). In addition to human capital, individual skills and abilities related to creation, prediction, or detection can influence the development or modification of organizational routines and capabilities (ibid). In the literature on dynamic capabilities, authors have highlighted individual-level antecedents such as managerial characteristics: (1) human managerial capital, (2) social managerial capital, and (3) managerial cognition (Adner and Helfat, 2003; Martin, 2011; Helfat and Martin, 2015; Huy and Zott, 2019; Kor and Mesko, 2013). They constitute microfoundations of DCs (Aberg and Shen, 2020). In this same vein, Malherbe and Loilier's (2019) study, conducted in a context of inter-organizational exchanges, shows that interaction between individuals allows for knowledge

exchange and social bonding. Knowledge exchange allows individuals to develop dynamic managerial capabilities through the strengthening of their human capital, social capital, and managerial cognition. This promotes the development of a dynamic capability for experimentation. Additional considerations build on these microfoundations, such as Kurtmollaiev et al.'s (2018) suggestion that design thinking can strengthen managerial sensing, seizing, and transforming capacities or Kevill et al.'s (2020) argument that managerial time allocation is another DC microfoundation for enacting organizational change. Finally, DMCs are heterogeneously distributed (Helfat & Martin, 2015), reflecting individual managerial characteristics, such that some managers can sense new opportunities more accurately than others; certain managers develop more effective business models (Teece, 2018) and make more inventive investment decisions than others; and some, who have better language and social capabilities, find it easier to gather support and implement strategic change.

Although DC development, beyond relying on DMCs as microfoundations, also depends on decision-making processes, this link is rarely noted in prior literature. Therefore, this study focuses on how leaders make decisions to develop DCs. As noted previously, organizations need to form management teams that contain members with both have analytical and intuitive cognitive styles, to develop DCs (Helfat & Peteraf, 2015; Hodgkinson and Healey 2011). We study this question at the individual level, by investigating one specific leader.

Rational and intuitive decision-making

In literature, there are several models of decision-making: rationality, bounded rationality, politics and power and garbage can (Eisenhardt and Zbaracki, 1992). Nevertheless, in psychology literature, authors introduced the two modes of information processing, intuitive (also called experimental) and analytical (or rational) (Epstein et al., 1996; Schul & Mayo, 2003; Smith and DeCoster, 2000). Then management studies adopted two parallel models of decision-making (Table 1), rational and intuitive (Biswas, 2009). In this study, we adopt these

two models. The rational model operates primarily at a conscious level and is intentional, primarily verbal, lacking in affect (Epstein et al., 1996), and reliant on rules to process information (Schul & Mayo, 2003; Smith & DeCoster, 2000). The resulting decisions, made in a controlled manner, are logical and guided by reason (Biswas, 2009). Thus, rational decision-making can be defined as a "decision process that involves the collection of information relevant to the decision and the reliance upon analysis of this information in making the choice" (Dean and Sharfman, 1993, p. 1071). Its use can be identified by three indicators (Kolbe et al., 2020): reliance on decision makers' cognition, knowledge, and informedness; reliance on the collection and analysis of information; and the calculation of possible decision outcomes.

An intuitive or experiential model instead is automatic, preconscious, holistic, associative, primarily nonverbal, and closely linked to affect (Epstein et al., 1996). Generated by emotional reactions, it allows for rapid evaluations of a situation (Biswas, 2009) and mainly offers benefits in complex situations (Schul and Mayo, 2003). These decision-makers adopt heuristic processing (Epstein et al., 1996). Authors define intuition in different ways. According to Jung (1933, cited in Dane and Pratt, 2007), intuition is a psychological function that transmits perceptions unconsciously. Rather than being irrational, it is based on a deep understanding of a situation (Khatri and Ng, 2000). This complex process draws on stores of knowledge in the subconscious mind and past experience (Khatri and Ng, 2000), as well as people's innate ability to synthesize information quickly and efficiently, such that it can be hampered by formalized procedures (Dane & Pratt, 2007). One definition refers to intuition as "a judgment for a given course of action that comes to mind with an aura or conviction of rightness or plausibility, but without clearly articulated reasons or justifications—essentially 'knowing' but without knowing why" (Hodgkinson et al., 2009, p. 279), which aligns with a definition of intuitive decision-making as "choices for alternatives that are driven by affectively charged judgments that arise through rapid, non-conscious, and holistic associations" (Dane & Pratt, 2007, p. 40).

Thus, intuitive decision-making is characterized by hunches, gut feelings, excitement, and emotions (Kolbe et al., 2020).

Decision-making literature also affirms that organizations can benefit from integrating team members with analytical and intuitive reasoning styles into teams (Hodgkinson & Healey, 2011), because rational and intuitive models represent complementary components of an effective decision-making system (Sinclair et al., 2002; Okoli & Watt, 2018). Dynamic environments likely require organizations to rely on a combination of both decision-making models; combining them also helps counteract the weaknesses of each model in terms of introducing errors, facilitating processing, dealing with problem complexity, and using creativity. That is, the rational model is appealing when information is objective, whereas the intuitive model intervenes in contexts of uncertainty and complexity (Dane & Pratt, 2007; Sinclair et al., 2002).

Ideally, the two decision-making models coexist in a seamless and integrated fashion. But in reality, they can come in conflict, such that a struggle arises between feelings and thoughts, and one of the two models dominates the other. According to Epstein et al. (1996), such dominance is determined by several parameters. First, certain people favor one over the other. Second, if they have developed habits of using one system rather than the other in particular situations, it informs people's choices. Mathematical problems are mainly handled by the rational system and interpersonal problems by the intuitive system, for example. Third, the degree of emotional involvement can determine model choices, such that strongly emotional involvement likely prompts the use of the intuitive model. Fourth, Okoli and Watt (2018) argue that the dominant decision-making strategy depends on the nature of the task environment (scale of incident, level of risk, available time).

Table 1. Decision-making models

	Rational Model	Intuitive Model
Definition	"decision process that involves the collection of information relevant to the decision and the reliance upon analysis of this information in making the choice" (Dean and Sharfman, 1993, p. 1071).	Intuition: "a judgment for a given course of action that comes to mind with an aura or conviction of rightness or plausibility, but without clearly articulated reasons or justifications—essentially 'knowing' but without knowing why" (Hodgkinson et al., 2009, p. 279). Intuitive decision making: "choices for alternatives that are driven by affectively charged judgments that arise through rapid, non-conscious, and holistic associations" (Dane & Pratt, 2007, p.40).
Indicators	(1) the use of decision makers' cognition, (2) knowledgeability and well-informedness; (3) the reliance upon collection and analysis of information and the calculation of possible decisions' outcomes.	Hunches and gut feelings or excitement and emotions (Kolbe et al., 2020).
Characteristics	Conscious, intentional, analytical, primarily verbal, does not use affect (Epstein et al., 1996).	Automatic, preconscious, holistic, associative, primarily nonverbal, and closely linked to affect (Epstein et al., 1996)
	Relies on rules to process information (Schul & Mayo, 2003; Smith & DeCoster, 2000).	Generated by emotional reactions, induces a rapidity in the evaluation of the situation (Biswas, 2009), mainly used in complex situations (Schul and Mayo, 2003).
Context	Objective information (Dane & Pratt, 2007; Sinclair et al., 2002).	Uncertainty, complexity (Dane & Pratt, 2007; Sinclair et al., 2002).
Situations	People's preferences, habits of using one system, degree of emotional involvement (Epstein et al., 1996), and nature of task environment (Okoli & Watt, 2018)	

In some situations, leaders follow only one or the other mode of decision-making. For example, Christensen (1997) shows that great firms sometimes struggle to find disruptive innovations, because their leaders adopt an overly rational reasoning style. According to Okoli and Watt (2018), during a crisis, the analytical mode, which focuses on one element at a time, is generally less viable, due to the uncertainty and need for flexibility created by the emergency. Overall, it remains unclear precisely how leaders make decisions to develop dynamic capabilities. Do they use a rational process or an intuitive process or do they combine the two processes?

Method

The qualitative research methodology relies on a longitudinal, retrospective case study (Yin, 2009), pertaining to Steve Jobs. Extensive data are available related to this leader and his actions. As the co-founder, along with Steve Wozniak, of Apple Computers (established in 1976), Jobs was responsible for many product successes, including the Apple I, Apple II, and Macintosh computers. Yet he also famously was ousted from Apple in 1985, after which he undertook several new initiatives, including the creation of NeXT (a computer company for the academic world) and the purchase of Pixar, which he successfully transformed into a leading animated film company. Within Pixar, he pushed the widely popular animated film *Toy Story*. Then in 1996, Jobs returned to Apple and oversaw great successes such as the iMac, iPod, iTunes, iStore, iPhone, and iPad.

To the extent that a DC is a process that gets repeated several times (Laaksonen & Peltoniemi, 2018), we sought to study activities that Jobs performed multiple times; firm restructuring and product development meet this criterion. In the context of corporate restructuring, we thus analyze Pixar's restructuring after Jobs's acquisition of the company, as well as Apple's restructuring after his return in 1996. Pertaining to new product development, we study two highly significant products, for which we have extensive data: the realization of *Toy Story* at Pixar and the development of the iPhone at Apple. In studying both processes (business restructuring and product development), we confirm that they are DCs, insofar as they each comprise the three key components: sensing opportunity, seizing the opportunity, and transforming the resource base (Teece, 2007a).

Variables

Without a clear consensus about how to operationalize DCs, we propose an operationalization for this study that reflects their theoretical components (Laaksonen & Peltoniemi, 2018). On the basis of prior literature, we set four criteria: (1) recurrence of the process (Eisenhardt & Martin, 2000; Teece, 2007a; Kevill et al., 2020), (2) stability of the process (Zollo & Winter,

2002), (3) modification of resource base (Teece et al, 1997; Eisenhardt & Martin, 2000), and (4) performance improvement (Moliterno & Wiersema, 2007; Teece, 2007a; Bingham et al., 2015). For the two decision-making modes, we leverage their definitions to operationalize the study variables. Rational decision-making is characterized by a process that induces the collection and analysis of information (Dean & Sharfman, 1993). Intuitive decision-making is characterized by affectively charged judgments (Dane & Pratt, 2007), which reflect an aura or conviction of rightness and plausibility (Hodgkinson et al., 2009).

Data collection

The data are secondary and mainly collected from the biography of Jobs written by Walter Isaacson (2011). It relies on interviews with Jobs, as well as his relatives and colleagues, and is very well documented (568 pages). It offers precise details about the restructuring of Pixar and Apple, as well as the making of *Toy Story* and the development of the iPhone. In addition, the biography provides an in-depth analysis of Steve Jobs's personality. The book was written at his request, but notably, he did not influence the author or read the book before its publication. Issacson collected and analyzed data pertaining to the years 1955–2010, that is, from Jobs's birth up until his last product development (the iPad).

We combined the biographical data with other secondary data to facilitate triangulation (Table 2). For example, we consulted Leander Kahney's (2012) book *Inside Steve's Brain*. We also searched ebscohost for articles pertaining to Apple, Pixar or Steve Jobs.

Table 2. Sources of data

Nature	Sources	Data
Book	Isaacson (2011)	Dismissal Creation of NeXT Apple history Development of different products (iPhone, iPod, iPad) Personality traits of Jobs
Book	Kahney (2012)	Dismissal Creation of NeXT Apple history

		Development of different products (iPhone, iPod, iPad) Personality traits of Jobs
Video (Speech of Stanford)	YouTube	Steve Jobs's life trajectory
Article	Carroll (2013)	Jobs' skills Apple, NeXT
Article	Hurley-Hanson and Giannantonio (2013)	Steve Jobs' career path Apple, NeXT
Article	Richardson and Arthur (2013)	Analysis of Steve Jobs' Stanford speech
Article	Sonnenfeld (2013)	Analysis of Jobs' life
Article	Yu (2013)	Jobs' skills for innovation
Article	Roquilly (2009)	The introduction of the iPhone onto the market
Article	Heracleous and Klaering (2017)	Analysis of Stanford speech
Article	Wilner et al. (2014)	Jobs' characteristics Jobs' personality
Article	Finkle and Mallin (2010)	Pixar Toy Story Personality traits of Jobs

Heaton (2004) identifies five types of secondary analysis: supra analysis, supplementary, re-analysis, amplified analysis, and assorted analysis. Our research is consistent with a supplementary analysis, because we study a research question that has not been considered in any primary analysis. Few management studies use methodology focused on secondary sources (Chabaud and Germain, 2006); an exception is Weick's (1993) famous study of the Mann Gulch disaster. Some authors emphasize that using secondary data may be delicate or doubtful in view of the specificities of management science (Chabaud and Germain, 2006). Nevertheless, the validity can be affirmed on the basis of three principles: (1) the ability of primary data to address the research question (Chabaud and Germain, 2006); (2) the nature, quality, and depth of data (Hinds et al., 1997); and (3) data triangulation (Chabaud and Germain, 2006). In the same line, according to Loilier and Tellier (2004), the use of secondary data implies a strict procedure for selecting the empirical material. The quality of the data used is the best guarantee of the quality of the proposed reinterpretation. Stewart (1984) (cited in Loilier and Tellier (2004)) proposes a systematic framework for evaluating secondary data

sources. This evaluation framework is characterized by six questions[1] that the researcher must be able to answer without difficulty; this ease of response being an indicator of the quality of the data considered.

Data analysis

The data analysis proceeded in three steps. First, to identify DCs, we used a narrative method (Langley, 1999; Boje, 2001; Creswell, 2007), in an attempt to trace the history of each of the four main processes—restructuring of Pixar, restructuring of Apple, realization of *Toy Story*, and development of the iPhone—in chronological order. We thus developed four monographs for comparison, then compared the restructuring of Pixar with the restructuring of Apple and the realization of *Toy Story* with the development of the iPhone. In each category, the processes met the criteria of a DC (recurrence of the process, stability of the process, modification of resource base, and performance improvement), so we consider a DC for firm restructuring and a DC for product development. Second, we analyzed the monographs to identify the decision-making processes, as rational or intuitive. Third, we sought the managerial characteristics linked to each decision-making processes, in an effort to understand the role of managerial characteristics in mobilizing both rational and intuitive processes.

Findings

By detailing the two DCs, focusing on the rational and intuitive decisions involved in each, we expose the contextual elements that inform their development. In turn, we can identify some managerial characteristics that favor each decision-making process.

Combining rational and intuitive decisions and developing DCs

Jobs's ability to alternate between rational and intuitive decisions allows him to develop DCs. The two occurrences of the same DC thus result from decisions of different nature (Figure 1).

[1] 1. What was the purpose of the primary collection? 2. Who was responsible for the collection? 3. What information was collected? 4. When was the information collected? 5. How was the information obtained? 6. Is the information corroborated by other sources?

For the DC for firm restructuring, we find that Pixar's restructuring was characterized by a strong presence of intuitive decisions, but Apple's involved rational decisions. Regarding the DC for product development, the results show that making *Toy Story* resulted from a strong mobilization of intuition, whereas the development of the iPhone mainly relied on analytical reasoning, combined with intuitive reasoning. In presenting the two DCs, we describe major decisions made by Jobs (not the monographs in their entirety), to establish their foundations in a rational and/or intuitive approach.

Dynamic capability for firm restructuring

Pixar and intuitive decision-making

Pixar originally functioned as the computer department of Lucasfilm Studio; it was acquired by Jobs in January 1986, following his dismissal from Apple and after he already had started NeXT. Under Lucasfilm, the department comprised two teams, one that developed computers and another that specialized in digital animation. It was suffering significant financial losses, such that Lucasfilm put it up for sale. After Jobs acquired it, he restructured Pixar. The decisions to both acquire and restructure Pixar were guided mainly by Jobs's intuition; rational decision-making appeared less important. For example, he predicted that three-dimensional animation would be a popular technology, so "I wanted to buy it because I was really into computer graphics, … I realized they were way ahead of others in combining art and technology, which is what I've always been interested in" (Isaacson, 2011, p. 219). George Lucas recalled trying to warn Jobs that the department mainly specialized in animation, not the manufacture of computers, out of the concern that Jobs was counting on its computer capabilities to combine the two technologies. Yet "Jobs met only once with George Lucas, who warned him that the people in the division cared more about making animated movies than they did about making computers" (Isaacson, 2011, p. 219).

In the restructuring effort, Jobs chose to expand the digital animation department, which had been a secondary division. Even as the computer and software divisions continued to accrue losses, Jobs embraced his intuition and emotions, characterized by feelings of happiness and hope, and took a risk on the new, unproven technology being applied by the animation division, such that "Even as Pixar's hardware and software product lines foundered, Jobs kept protecting the animation group. It had become for him a little island of magical artistry that gave him deep emotional pleasure, and he was willing to nurture it and bet on it" (Isaacson, 2011, p. 226). To expand the digital animation department, Jobs continued to make decisions intuitively, such as financing a new film, helmed by the director John Lasseter, with his own funds when the company could not and needed to rationalize its costs:

> Lasseter and his animation group were almost too afraid to ask Jobs about authorizing some extra money for another short.… It would require close to $300,000 more out his pocket.… Jobs said he would provide the money. I believe in what John was doing … he later said, 'It was art. He cared, and I cared. I always said yes.' His only comment at the end of Lasseter's presentation was, 'All I ask of you, John, is to make it great.' (Isaacson, 2011, p. 227).

In total, to establish the animation division and support new films, Jobs injected tens of millions of dollars from his own funds, and then

> Renaming it Pixar, Jobs propped up the struggling company for a decade with $60 million of his own money, only to see it eventually produce a string of blockbusters and turn into Hollywood's premier animation studio. (Kahney, 2012, p. 7)
>
> By this point Jobs had poured close to $50 million of his own money into Pixar–more than half of what he had pocketed when he cashed out of Apple. (Isaacson, 2011, p. 227)

Apple and rational decision-making

After his dismissal from Apple in 1985, Jobs's goal remain to take back the reins. An opportunity arose in the 1990s, when Apple needed a new operating system. Jobs contacted Apple executives and told them that NeXT's operating system would work. By convincing Apple to buy NeXT, Jobs was able to return to Apple, in its much diminished state. By 1996, the company's market share had fallen to 4%, compared with 16% in the 1980s (Isaacson, 2011, p. 272). To revive the business, Jobs undertook a restructuring, but unlike the one he imposed on Pixar, Apple's restructuring was characterized by rational decisions. He started by analyzing and evaluating the company's situation, from which he drew several conclusions. In particular, he noted a lack of innovation: "After I left, it didn't invent anything new. The Mac hardly improved. It was a sitting duck for Microsoft" (Isaacson, 2011, p. 272). Furthermore, he criticized the company's poor management and lack of strategy: "There are a lot of great people at Apple, but they're doing the wrong things because the plan has been wrong … I've found people who can't wait to fall into line behind a good strategy, but there just hasn't been one" (Isaacson, 2011, p. 296).

His subsequent decisions reflect Jobs's analytical reasoning. For example, he opted to modify the company's policy to emphasize the elements that he considered fundamental to the success of the company, such that "We're trying to get back to the basics of great products, great marketing, and great distribution. Apple has drifted away from doing the basics really well" (Isaacson, 2011, p. 306). Along with these universal goals, he chose to refocus on what had made Apple successful in the past, because "Jobs knew that Apple was only a few short months from bankruptcy, and the only way to say the company was to focus keenly on what it did best: build easy-to-use computers for consumers and creative professionals" (Kahney, 2012, pp. 29-30). In his review of the company's strategy, he realized he could eliminate certain products, including "hundreds of software projects and almost all the hardware" (Kahney, 2012, p. 30), such that "He began slashing away at models and products. Soon he had cut 70% of

them.… Their job, he said, was to make four great products" (Isaacson, 2011, pp. 310-311). Among the discontinued products, printers did not generate sufficient profits and benefited Hewlett-Packard more than Apple, leading him to assert: "I don't understand, Jobs said at the product review meeting. You're going to ship a million and not make money on these? This is nuts … Steve looked at the situation and instantly knew we needed to get outside of the box" (Isaacson, 2011, p. 311).

Dynamic capability for product development

Toy Story and intuitive decision-making

Pixar and Disney signed an agreement as part of a strategic alliance to develop animated films. Initially, the agreement included the development of five films, the first of which was *Toy Story*. But when a script disagreement arose, and the director John Lasseter wanted to rewrite it, Disney halted the production. Jobs could have abandoned the film and started a new one, but instead, he decided to finance *Toy Story* on his own and give Lasseter the opportunity to rewrite the script. His choice stemmed from Jobs's sense that the film's characters were endearing and that the outcome could be a great film. Furthermore, Jobs wanted to show Disney that not only was Pixar capable of rewriting a script but that it even would be better without Disney's intervention, which "wanted Woody to be a bad guy, and … we kind of kicked him out and said, This isn't what we want, and did it the way we always wanted" (Isaacson, 2011, p. 263). Ultimately, the Disney team approved the new script, but the rewrite generated substantial additional costs, prompting Jobs to ask for a budget extension to finish the film. Jobs insisted that Disney should bear the cost, because the overrun was due to the company's director, but Disney executives refused, noting that Jobs had agreed to produce the film with the original Disney budget allocation.

This incident drove Jobs to the realization that Pixar needed to increase its bargaining power. The situation conflicted with Jobs's personality; he did not appreciate being relegated to

the background. In response, Jobs began "plotting about how to have more leverage with Disney in the future. He did not like being a mere contractor; he liked being in control. That meant Pixar would have to bring its own funding to project in the future, and it would need a new deal with Disney" (Isaacson, 2011, p. 264). Although the initial contract included five collaborative films, Jobs rushed to take Pixar public soon after the release of *Toy Story*, to gain the funds and power necessary to revise the terms of the contract, despite the reluctance of other investors. John Lasseter even recommended that Jobs should wait until the end of the contract, so that Pixar could release five films and prove itself, thereby potentially increasing the chances of a successful initial public offering (IPO). Instead, Jobs moved quickly, likely because the relationship with Disney created a cognitive dissonance for him and removed him from a leading role, so even though "I was nervous and argued that we should wait until after our second movie … Steve overruled me and said we needed the cash so we could put up half the money for our films and renegotiate the Disney deal" (Isaacson, 2011, p. 265).

The film was a huge success, grossing $30 million in the domestic market alone. The company's stock went on sale one week after its release. Pixar's IPO was a success, giving Jobs the negotiating power he needed to impose his choices on Disney. Jobs asked to revise the terms of the contract, such that Pixar could finance projects up to 50% and take half of the profits. Thus, two major intuitive decisions Jobs made related to *Toy Story* were to finance the film with his own money and to take Pixar public.

iPhone and rational decision-making

When developing the iPhone, Jobs's strategic decisions feature elements of both analytical reasoning and intuition. A first major decision was to develop a new business to manufacture phones, which resulted from analytical reasoning. Through collecting and interpreting information, Jobs began to question the future of Apple's then-flagship product, the iPod. He observed that the digital camera industry was being challenged by camera-equipped cell

phones, and he thought that the same thing could happen to the iPod if manufacturers started equipping their phones with MP3 players:

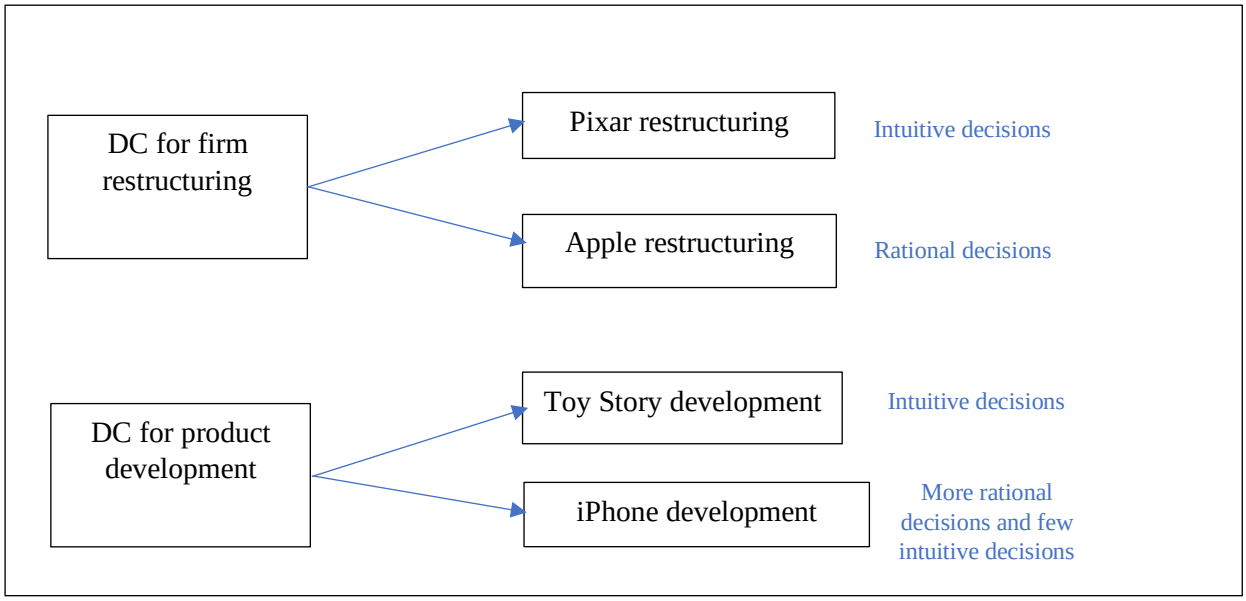
> He was always obsessing about what could mess us up.… The device that can eat our lunch is the cell phone. As he explained to the board, the digital camera market was being decimated now that phones were equipped with cameras. The same could happen to the iPod, if phone manufacturers started to build music players into them. Everyone carries a phone, so that could render the iPod unnecessary. (Isaacson, 2011, p. 429).

During the course of the development process, Jobs also carefully considered several alternatives. Initially, he wanted to partner with a company that specialized in manufacturing cell phones; Apple did not have these capabilities. But when an early version failed to receive favorable reviews from the public or the media, Jobs decided to manufacture a phone in-house, without going through a third-party company, because "I'm sick of dealing with these stupid companies like Motorola…. Let's do it ourselves" (Isaacson, 2011, p. 430). Then he called for a precise analysis of the defects of existing phones and how Apple could improve them, such that Apple executives "would sit around talking about how much we hated our phones.… They were way too complicated. They had features nobody could figure out, including the address book. It was just Byzantine" (Isaacson, 2011, p. 430).

Although the early stages of the iPhone development process thus were characterized by an analytical approach, strategic choices related to its features appear based more on intuition and emotion. For example, for the iPhone screen, the company worked on two possible alternatives in parallel: a scroll wheel, similar to the one on the iPod, or a touch screen. After six months of work on both projects, Jobs gathered the respective teams to make a choice. Despite the limited development of the touch screen relative to than the scroll wheel—at the time, touch screens still had not been proven completely feasible—Jobs made a decision based on what he felt was more promising: "We all known this is the one we want to do said Jobs

pointing to the touchscreen. So let's make it work. It was what he liked to call a bet-the-company moment, high risk and high reward if it succeeded" (Isaacson, 2011, p. 433). In response to several members who advocated a physical keyboard, Jobs worked to convince them of the superiority of the touch screen, by encouraging them to "Think of all the innovations we'd be able to adapt if we did the keyboard onscreen with software. Let's bet on it, and then we'll find a way to make it work" (Isaacson, 2011, p. 433). He was alone in this belief; even Microsoft's CEO was skeptical, calling the iPhone "the most expensive phone in the world…. And it doesn't appeal to business customers because it doesn't have a keyboard" (Isaacson, 2011, p. 438).

Figure 1. Two dynamic capabilities



Managerial characteristics that explain decision-making processes

Some managerial characteristics favor both rational and intuitive decisions, such as human capital and managerial cognition. Others foster intuitive decisions specifically, including an emotional personality, emotional state, and self-esteem (Figure 2).

Rational decision-making process

Human capital

Rational decisions were primary for the Apple restructuring and iPhone development. Both these contexts were well-known to Jobs, such that his restructuring efforts involve activities that Jobs already had mastered through his specialization in the computer industry and high tech. In these situations, he had a strong sense of control and thus could apply a rational process to make decisions, including observing the context, gathering information, and processing that information. In contrast, in the cases of restructuring Pixar and developing *Toy Story*, he used intuitive approaches to pursue activities that he did not know and needs to master. In such uncertain situations, he could not use an analytical model and had to mobilize his intuition.

Managerial cognition

Managerial cognition also explains the rational decision process. As previously stated, Apple's restructuring and the iPhone's development resulted from rational decisions that Jobs made because he had experience in these business sectors. The experience and learning he developed previously forged his mental schema so that in similar contexts, his mental schema led him to mobilize the same process, that is, a rational process.

Intuitive decision-making process

Intuitive decisions are fostered by human capital and managerial cognition, similar to rational decisions. But some other managerial characteristics are specific to intuitive decisions, such as emotional personality, emotional state, and self-esteem.

Human capital

A strong mobilization of intuition can be explained by human capital. Jobs's personal experience in the East led him to place great importance on intuition, calling it "a very powerful thing, more powerful than intellect, in my opinion. That's had a big impact on my work…. Coming back after seven months in Indian villages, I saw the craziness of the Western world as well as its capacity for rational thought" (Isaacson, 2011, p. 45). Following his intuition

allowed Jobs to make choices he would not have made if he had followed rational reasoning, including both the purchase of Pixar and the choice of the touch screen for the iPhone.

Managerial cognition

Some intuitive decisions are explained by managerial cognition. For example, Jobs's thought patterns led him to classify people into two categories, geniuses or losers, "partly out of his tendency to see the world in binary terms. A person was either a hero or a bozo, a product was either amazing or shit. But he could be stymied by stymied by things that were more complex, shaded or nuanced" (Isaacson, 2011, p. 290). This way of thinking led him to act according to his emotions and make intuitive decisions. For example, at Pixar, he financed films with his own funds, because he regarded John Lasseter as a genius and felt he could make great films: "Lasseter was an artist, so Jobs treated him deferentially" (Isaacson, 2022, p. 223).

Emotional personality

An inclination toward intuition also can be explained by emotion. Intuition is often linked to emotions; Jobs had a very emotional personality and could get carried away and even start to cry when confronted with emotionally powerful situations. When Steve Wozniak's father, who believed Apple's profits should mostly go to his son, because Jobs had done nothing, confronted Jobs, alleging, "You don't deserve shit.… You haven't produced anything. Jobs began to cry, which was not unusual. He had never been, and would never be, adept at containing his emotions" (Isaacson, 2011, p. 67). Acting on his emotions benefited Jobs, because he made decisions that he would not have if he had followed a rational mode of reasoning, including the decision to develop *Toy Story*.

Emotional state

The restructuring of Pixar and the development of *Toy Story* were characterized by intuitive decisions. Apple's restructuring and the development of the iPhone were characterized primarily by rational decisions, but intuition also was involved in the development of the

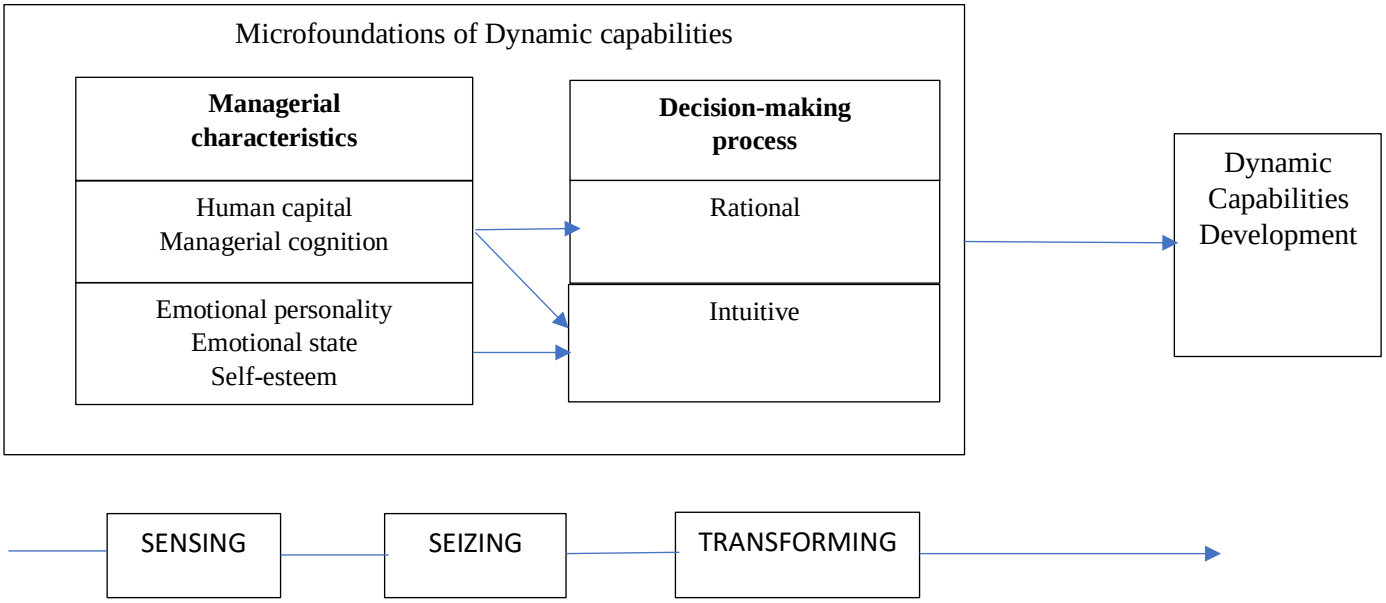
iPhone. A factor that explains this difference is Jobs's emotional state. When in a negative emotional state, Jobs took more risks than when he was in a positive emotional state. He decided to acquire Pixar when the company was losing money, knowing full well that it was not in the business of making computers (and having no certainty about the future of digital movies). Similarly, when Disney no longer wanted to finance *Toy Story*, Jobs financed its production. Both projects reflect notable risk-taking on his part, which occurred soon after Jobs suffered two prominent failures (eviction from Apple and failure with NeXT), leading to his negative emotional state. After having suffered two failures, Jobs did not want a third: "He would rail, but then write the check. Having been ousted at Apple and flailing at NeXT, he couldn't afford a third strike" (Isaacson, 2011, p. 225).

High self-esteem

As mentioned, a driver of Pixar's IPO was the cognitive dissonance that Jobs felt at being relegated to the background, which did not match his high self-esteem. In particular, Jobs believed he was different and superior to others, which likely prompted his intuitive decision to take Pixar public. He could not bear to take a secondary role, as shown in "An early showdown … over employee badge numbers. Scott assigned #1 to Wozniak and #2 to Jobs. Not surprisingly. Jobs demanded to be #1" (Isaacson, 2011, p. 76). This high self-esteem also manifested in Jobs's self-image as a chosen and enlightened individual:

> He had the sense that he was special, a chosen one, an enlightened one. He thinks there are a few people who are special people like Einstein and Gandhi and the gurus he met in India and he's one of them…. Once he even hinted to me that he was enlightened. (Isaacson, 2011, p. 109).

Figure 2. Relationships between managerial characteristics, decision-making process and dynamic capability development: an integrative model



Discussion and conclusion

This study makes three main contributions to DC literature. First, it offers a new perspective on DMCs and DCs by acknowledging that a DC can be shared by multiple firms managed by the same leader (Figure 3), rather than being solely exclusive to one firm (Bingham et al., 2015; Farzaneh et al., 2022; Elf et al., 2022). By studying DMCs with a case study involving one leader, we show that DMCs can establish DCs that can be deployed in multiple firms managed by this leader, as long as the leader has adaptability and can switch between rational and intuitive decisions. In some firm contexts, the leader might mobilize his or her skills; in other contexts, these skills could be inappropriate (e.g., Jobs's computer skills at Pixar), so the leader must leverage his or her intuition. In line with Hodgkinson and Healey's (2011) assertion that organizations that combine rational and intuitive members in their management team are more likely to develop DCs, we show that the abilities of a single leader to combine rational and intuitive decisions can favor the development of DCs too.

Second, this study adds considerations of managerial characteristics to research into DMCs. Building on studies that have enunciated various managerial characteristics that support DC development (Adner & Helfat, 2003 ; Martin, 2011 ; Helfat & Martin, 2015; Kurtmollaiev et al., 2018; Kevill et al., 2020), we advocate for including emotional personality, emotional state, and high self-esteem. In addition, we identify several links between the nature of the decision and managerial characteristics. Notably, this study indicates that human capital and managerial cognition can favor both rational and intuitive decisions, whereas emotional personality, emotional state, and self-esteem are more favorable for intuitive decisions.

Third, we bridge DC literature and other literature streams. In their literature synthesis, Schilke et al. (2018) call explicitly for articulating DCs using various theories, to expand the scope of the DC research domain. We respond to this call by integrating decision-making, emotion, and intuition concepts into DC literature. As our research highlights, leaders must be able to combine rational and intuitive decisions to develop DCs, and different contexts are more aligned with rational versus intuitive decision-making. With these insights, we corroborate prior findings that rational decisions are more common in controlled contexts (Biswas, 2009). When Jobs made rational decisions about the Apple restructuring and the development of the iPhone, it reflected his control over the situation, gained from his prior experience working in computer firm. Intuitive decisions instead arise in complex situations (Schul and Mayo, 2003), as exemplified by the Pixar restructuring and realization of *Toy Story*, which took place in industries less familiar to Jobs. Choosing between decision-making processes often reflects the degree of emotional involvement (Epstein et al., 1996). When Jobs took Pixar public or financed the films on his own, it was because he already had experienced two failures and did not want a third.

Our study also identifies other influences that can explain the choice between rational and intuitive decisions. Two factors are crucial: competences and skills. If a leader has the

competences required by the context, it can lead a rational decision (Apple restructuring), but if the leader lacks such context-specific competences, an intuitive decision is preferable. Trust can facilitate intuitive decision-making because trusting someone else, who claims to have the required skills, facilitates intuitive decision-making. Jobs trusted the director's skills. This intuition then allowed Jobs to seize an opportunity that would not have been seized otherwise (Hodgkinson & Healey, 2011). Without intuition, Jobs would never have bought and restructured Pixar or developed *Toy Story*. People in a negative emotional state are willing to take more risks than those in a positive emotional state (Arkes et al., 1988; Isen & Patrick, 1983; Kuvaas & Kaufmann, 2004; Mittal & Ross Jr., 1998). Our study emphasizes that when Jobs was in a negative emotional state, he tended to take more risks, favoring new opportunity seizing and thus the development of DCs.

In terms of managerial implications, we emphasize the importance of combining rational and intuitive decisions-making to develop DCs. Managers should develop skills to mobilize appropriate decision-making processes in appropriate contexts. They can do so through experience and time, but leaders also might develop an awareness of how intuition is relevant, even if management teams seem to prefer less risky approaches based in rational choices. Notably, emotions are critical to the mobilization of an intuitive approach. It is therefore important that leaders learn to manage and leverage their emotions.

Our study has some limitations that might be addressed by further research. We propose that leaders must be able to juggle rational and intuitive decisions-making to develop DCs that can be applied across decision contexts and firms. To establish this claim, we study Steve Jobs, who remarkably managed two different firms simultaneously. It would be interesting to study other contexts, perhaps within the same firm, to understand if distinct departments or business units might require decisions of varying nature and if leaders must adapt their decision-making processes accordingly. A related extension could investigate different subsidiaries of the same

group to determine if some DCs are deployed transversally and analyze whether their different occurrences reflect different decision-making processes. Furthermore, we highlight the importance of emotions for intuitive decision-making, but we only considered Jobs's emotions, not those of other stakeholders, even though others' emotions might encourage resource transformation or DC development (Hodgkinson & Healey, 2011). It would be interesting to learn how stakeholders' emotions link with decision-making processes. Finally, our study did not allow to open the black box of sensing, seizing and transforming in order to understand which decision is made in each component. Future studies could seek to understand the nature of the decisions that are made in each component, i.e. sensing, seizing and transforming.

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