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Khalil, Sabine; Winkler, Till J.

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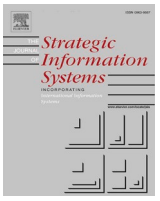

How software as a service simultaneously affords organizational agility and inertia

Sabine Khalil [a], Till J. Winkler [b,*]

[a] Illinois State University, College of Business, Illinois, United States
[b] University of Hagen, Germany and Department of Digitalization, Copenhagen Business School, Denmark

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ABSTRACT

Although cloud computing is associated with organizational agility, anecdotal evidence points to resistance to cloud computing by employees in information technology (IT) units. We explored the links between software as a service (SaaS) and organizational agility by conducting two stages of interviews with key informants in large organizations, and by employing affordance and inertia-theoretical lenses. Two basic affordances emerged from the retroductive data analysis – implementing quickly and sourcing independently – which in turn yielded two higher-level affordances: trialing alternatives and self-organizing business teams. We developed a model that explains how and why these four affordances enhance agility by accelerating the sensing-to-acting process of organizations. We also describe how five categories of organizational inertia in IT units hinder agility. Our main contribution is how adopting SaaS applications enables organizational agility while highlighting the role of IT unit inertia in SaaS affordance actualization processes.

Introduction

Recent management research has taken considerable interest in organizational agility as a critical capability for organizations to survive in an ever-changing business environment (Overby et al., 2006; Teece et al., 2016). Organizational agility – the ability to exploit unexpected changes as opportunities through innovative and rapid decisions (Lu and Ramamurthy, 2011; Sambamurthy et al., 2003) – enables organizations to adapt to fast-changing market conditions by integrating, building, and reconfiguring internal and external resources (Chakravarty et al., 2013; Schneider and Sunyaev, 2016). Information technology (IT) is generally considered an enabler for, but often also an impediment to, organizational agility (Lu and Ramamurthy, 2011; Sambamurthy et al., 2003). While studies have addressed the conditions under which investment into overall IT enhances agility (Vial, 2019; Tallon et al., 2019), few authors have delved into how specific information technologies can enhance organizational agility and the surrounding organizational characteristics facilitating and inhibiting agility (e.g., Seethamraju and Sundar, 2013; Zelbst et al., 2011).

The widespread move to cloud computing is one of the most fundamental technology shifts that remains a top concern for contemporary strategic information systems (IS) management (Kappelman et al., 2020). Cloud computing refers to applications, development platforms, and infrastructure delivered as a service over the internet (Mell and Grance, 2011). Cloud computing differs from the information technologies previously studied in the context of agility (e.g., ERP or RFID; Seethamraju and Sundar, 2013; Zelbst et al., 2011) because it represents a delivery model innovation. Although some studies have argued for increased organizational agility

* Corresponding author at: Universitätsstraße 47, 58097 Hagen, Germany.
E-mail address: till.winkler@fernuni-hagen.de (T.J. Winkler).

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as one of the benefits of cloud computing (Kathuria et al., 2018; Liu et al., 2018; Venters and Whitley, 2012), some anecdotal evidence indicates that cloud technology also faces resistance from IT employees (e.g., Carver, 2017; Theis, 2017). This paradox can be traced to fears of IT employees losing their jobs and being replaced by cloud services (Khalil et al., 2017). Hence, the role of organizational resistance in IT units when studying the agility outcomes of cloud computing must be considered.

However, the current understanding of the links between cloud adoption and organizational agility is limited because prior studies have black-boxed the causal chain between technology and its outcomes, and have blended different cloud service models in their investigations. Thus, prior studies have been unable to unveil how and under which conditions the characteristics of a specific cloud service model support organizational agility. In addition, prior work lacks consideration of the potentially inhibiting role of organizational resistance in this causal chain. Thus, we still lack deeper insight into how specific cloud service models enhance organizational agility and how the potential resistance of IT units can hamper this agility.

Following a call to explore the role of cloud-based systems in the capabilities of companies to react to change (Tallon et al., 2019) and building on the theoretical advancements of the prior cloud literature (Kathuria et al., 2018; Krancher et al., 2018; Liu et al., 2018), the aim of this study is to unveil how software as a service (SaaS)—the most widely deployed cloud service model (Statista, 2022)—is linked to organizational agility. In addition, given the anecdotal evidence of IT employees' resistance to cloud technology (e.g., Carver, 2017; Theis, 2017), this study also considers possible dimensions of organizational inertia that emerge from SaaS affordances and may ultimately impede organizational agility (Ali et al., 2016; Chang et al., 2013; Conboy and Morgan, 2011). Organizational inertia unfolds from implementing IS within an organization "*to resisting a change*" (Besson and Rowe, 2012, p. 115). Hence, we ask how (i.e., by which mechanisms) SaaS can enhance organizational agility and address which role organizational inertia plays in this process.

After an initial stage of exploratory interviews and analysis of data from key informants at 35 organizations in France that used SaaS applications for more than three years, we followed a retroduction approach that alternated between evidence-informed and theory-driven steps (Mukumbang, 2023). For addressing our two-fold research objective, we chose the affordance theory (Strong et al., 2014; Volkoff and Strong, 2013) and organizational inertia (Besson and Rowe, 2012) as the two pertinent theoretical lenses. The retroduction approach facilitates clarifying the observed events by recognizing, based on the literature, the mechanisms that would produce them (Sayer, 1992). Then, we engaged in the second stage of interviews with the same 35 subjects using a revised interview guide that considered the emerging affordance and inertia theory lenses.

The two-stage qualitative analysis suggests that SaaS applications provide four affordances: implementing quickly, sourcing independently, trialing alternatives, and self-organizing business teams. While implementing quickly and sourcing independently are basic affordances arising from SaaS essential characteristics, trialing alternatives and self-organizing business teams are two higher-level affordances that emerge after actualizing the two basic affordances through the immediate concrete outcomes of short setup times, low maintenance costs, and less dependency on the IT unit.

These findings also identify two organizational environmental characteristics— mimetic tendency and decentralized IT decision-making—that facilitate the actualization of the affordances of implementing quickly and self-organizing business teams, respectively. The two higher-level affordances, trialing alternatives and self-organizing business teams, support organizational agility by quickly determining business solutions and rapidly implementing business changes, respectively. On the downside, self-organizing business teams can simultaneously lead to inertia through shifts in decision-making power, impeding organizational agility through resistance to change from IT units.

Our analysis synthesizes these findings into a theoretical model, making three novel contributions to the literature. First, the model offers a perspective on the influence of SaaS applications on organizational agility by revealing previously unknown mechanisms (represented as affordances and their immediate concrete outcomes) through which SaaS applications enhance sensing, decision-making, and acting agility. Second, this study contributes to the affordance literature by demonstrating the importance of the influence of organizational environmental characteristics (e.g., mimetic tendency and decentralized IT decision-making) in actualizing technology-induced affordances. Third, this study contributes to the organizational change literature in IS, traditionally focused on resistance exerted by IS users, by unveiling organizational inertia dimensions within IT units. Moreover, it highlights how, when, and why IT units can become barriers to organizational agility.

This remainder of this article reviews the literature on SaaS, affordance theory, and organizational inertia. It then reports the methodology adopted for this research work, the analysis results, and the emergent framework. Finally, it discusses this study's theoretical and practical implications and offers concluding remarks.

Literature review

Cloud and software-as-a-service

Cloud services have been defined as a model that enables ubiquitous access to scalable, shared, and configurable computing resources, which are provisioned on-demand with minimal customer–provider interaction and can be operated with minimal management effort (Mell and Grance, 2011). Mell and Grance (2011) identify five essential characteristics of cloud computing: on-demand self-service, broad network access, resource pooling, rapid elasticity or expansion, and measured service. With the highest level of abstraction from underlying computing resources, the cloud service model SaaS is the most mature area of cloud computing and the most adopted model, as market figures indicate (Statista, 2022). The literature has broadly addressed the motives for SaaS adoption. Among the most frequently mentioned motives are economic reasons (Onwubiko, 2010; Srinivasan, 2013), increased performance (Benlian and and Hess, 2011; Dutta et al., 2013), and ubiquitous access (Bose and Luo, 2011; Khalil et al., 2016).

Additionally, according to Benlian et al. (2009), social influence is one of the strongest drivers of SaaS adoption. Many authors have

affirmed that mimetic processes and the desire to imitate others push organizations to implement SaaS applications (Kung et al., 2015; Yigitbasioglu, 2015; Benlian et al., 2009), which can be regarded as one form of institutional isomorphism (DiMaggio and Powell, 1983). The literature has also recognized that other organizational choices are relevant to generating value from SaaS applications, such as allocating organizational decision-making (Winkler and Brown, 2013). Implementing a decentralized versus centralized decision-making process can influence the quality of cloud services. According to Choudhary and Vithayathil (2013), making decisions in a decentralized manner would be the most beneficial choice when adopting cloud services, offering a more significant internal quality enhancement of cloud-based IT services. Mimetic processes (Benlian et al., 2009; DiMaggio and Powell, 1983; Meyer and Rowan, 1977) and decentralized decision-making (Winkler and Brown, 2013; Choudhary and Vithayathil, 2013) have also emerged as two relevant organizational environmental characteristics in this study of SaaS affordances.

In addition to the motives for SaaS adoption, the literature has also addressed many barriers, where privacy and security issues are the most prevailing. Researchers have affirmed that storing sensitive and confidential data through SaaS constitutes a critical challenge for organizations, inhibiting them from adopting SaaS applications (Oredo and Njihia, 2014; Voorsluys et al., 2011). Although scholars have extensively researched the motives and barriers concerning SaaS adoption, relatively little is known about the organizational and value-creating outcomes of cloud use (Benlian et al., 2018). The following section reviews cloud adoption outcomes and introduces the chosen affordance lens employed after Stage 1 of the retroductive empirical approach to address the affordance outcomes of the SaaS service model, specifically organizational agility and inertia.

SaaS agility outcomes and affordance lens

Organizational agility is a firm-performance prerequisite frequently examined in association with IT (Tallon et al., 2019). Organizational agility can be defined as the capability of organizations to exploit unexpected changes as opportunities through innovative and rapid decisions (Lu and Ramamurthy, 2011). Agility is critical to sustaining competitive advantage in today's exceptionally dynamic environment (Swafford et al., 2008). The literature emphasizes that IT particularly enhances organizational agility by reducing the time that companies need between sensing market changes, making decisions, and acting accordingly (Park et al., 2017; Levallet and Chan, 2022). We considered the time spans between sensing, decision-making, and acting tasks as manifestations of agility to examine the outcomes of SaaS after the first round of the retroductive approach.

Sensing tasks include scanning events that could lead to business changes and influence business strategies, which requires acquiring knowledge about environmental events while filtering out unimportant information (El Sawy, 1985; Thomas et al., 1993). Sensing leads to decision-making and acting tasks, which enable organizations to become reactive and proactive to environmental changes (Park et al., 2017). Decision-making represents the task of evaluating possible opportunities and threats as well as deciding on adequate activities that maximize the effect of opportunities and minimize the effect of threats (Park et al., 2017). Decision-making can cause a time delay due to tension created by resource scarcity (Tallon et al., 2019). Acting tasks refer to process adjustments, organizational structure redesign, and resource reconfiguration to initiate new competitive actions in the market (Park et al., 2017; Teece et al., 1997). Information technology, such as the SaaS delivery model, can affect organizational agility by making sensing, decision-making, or acting faster and more effective.

The prior cloud literature has frequently emphasized enhancing agility through cloud computing. For example, Venters and Whitley (2012) were among the first to note that organizations' desire to appreciate and respond to change is closely related to the promise of cloud computing to be quicker, lighter, and nimbler than traditional on-premise IT. Since then, other authors have provided empirical evidence concerning the agility-enhancing effects of cloud computing (Kathuria et al., 2018; Krancher et al., 2018; Liu et al., 2018).

These studies have addressed various cloud service model layers. Liu et al. (2018) investigated how two inter-firm infrastructure-as-a-service (IaaS) characteristics contributed to firm performance by partnering agility and demonstrated that these two IaaS characteristics (flexibility and integration) enhance firm performance by promoting organizational agility and facilitating the pursuit of market opportunities. Kathuria et al. (2018) investigated the effect of cloud services on firm performance and provided evidence of a value appropriation path that links three cloud-based capabilities with firm performance via business flexibility. Krancher et al. (2018) studied how two essential characteristics of the platform as a service (PaaS) can enhance agility in software development teams. Through a qualitative inquiry, the authors provided a substantive theory that unveils the basic and higher-level affordances that causally relate agility to these two PaaS characteristics (rapid elasticity and abstraction).

In summary, the literature has found organizational agility to be a central organizational outcome of cloud adoption, including the IaaS and PaaS service models, which provide infrastructure and development platforms as a service. However, we still lack specific insight into how the SaaS model, offering entire applications as a service, may enhance organizational agility. In a systematic review of the literature on IT and organizational agility, Tallon et al. (2019) concluded that an opportunity exists to explore the role of cloud-based services regarding the ability of firms in any industry to react to business changes. Because SaaS is on the highest level of abstraction of all cloud service layers, this service model may provide stronger affordances than IaaS or PaaS, as Krancher et al. (2018) conjectured. In their nature of examining mere correlations of cloud characteristics and organizational agility outcomes, variance theoretical approaches, such as those by Kathuria et al. (2018) and Liu et al. (2018), appear less suitable to unveil the mechanisms in detail that relate specific SaaS characteristics to organizational agility. In a qualitative inquiry, Krancher et al. (2018) employed an affordance lens that breaks down the causal chain between technical characteristics and agility into tiers of basic and higher-level affordances.

In this study, the affordance theory emerged as a potentially valuable lens to study the linkages between SaaS characteristics and organizational agility. Affordance theory was first introduced to the psychology field by Gibson (1966), who explained that a goal-

oriented actor perceives an object in terms of how this object would afford the actor possibilities to achieve a goal (i.e., how the object could be used to help the actor reach a goal). Gibson (1966) emphasized that an object in the actor's environment is more than just a set of inherent features of the object independent of the actor. The term "affordance" stems from the verb "to afford," which can be defined as "to provide inevitably." For example, a pen affords writing, and a chair affords sitting. However, the actors choose whether to actualize these affordances or not. They may also use the object in unintended ways. For instance, while the pen is typically used for writing, some might use it for scratching their backs, and while the chair is primarily for sitting, some might use it for standing.

Since its inception in psychology, the affordance lens has gained currency in many other fields, including IS. For example, IS researchers have used the affordance lens to study the influence of social media on organizational processes, such as knowledge sharing, socializing, and the exercise of power (Treem and Leonardi, 2013). Researchers have also used this lens to explain how technologies proactively support business transformations (Seidel et al., 2013) and to examine how organizations can appropriate their business intelligence applications (Glowalla et al., 2014). Applied to the context of SaaS, the object (SaaS application) allows the actions of users (e.g., employees) because of the technological characteristics of this object.

Based on the premise that affordances emerge due to a relation between actors and objects (Gibson and Carmichael, 1966; Volkoff and Strong, 2013), IS scholars have emphasized three crucial facets of this lens. First, the affordance lens assumes that actions taken by actors are oriented toward goals (e.g., the motives for adopting SaaS), which must be considered when explaining the various affordances that emerge (Krancher et al., 2018). Second, affordances can be connected by immediate concrete outcomes (i.e., results of the actualization of affordances) and arranged in logical chains where lower-level (basic) affordances can lead to higher-level affordances. Third, researchers have explored the effect of organizational environmental characteristics on the actualization of affordances. Specifically, Vidgen and Wang (2009) emphasized the lack of investigations regarding how work environment characteristics interact with a change process facilitated by IT.

Altogether, the affordance lens highlights an object's essential characteristics, the goals of its use, the actor's capabilities, the emerged affordances, and their immediate concrete outcomes in a given organizational environment. While many authors imply that affordances are positive, Gibson (1977) also discussed negative affordances. After Stage 1 of the retroductive approach, we adopted an organizational inertia lens to account for the intermediate findings on SaaS barriers.

Organizational barriers of SaaS and the inertia lens

Organizational inertia emerges when employees face radical change (Kelly and Amburgey, 1991). Generally, organizational inertia is "the tendency to remain with the status quo and the resistance to strategic renewal outside the frame of current strategy" (Huff et al., 1992, p. 56). Inertia reflects employee resistance to established work procedures regardless of the current or future alternatives (Moore, 1976). Change and inertia are interrelated and sometimes reinforcing; while inertia can disrupt change, inertia can also occur as an outcome of change (Singh and Hess, 2020). Inertia has long been recognized as a concept to theorize on organizational barriers in implementing IT, including digital transformations (Vial, 2019).

Table 1
Preliminary theoretical concepts.

Theoretical concepts		Definitions	References
SaaS characteristics	Pay-per-use	Payment model where consumers pay a subscription fee based on actual software use	Dutta et al., 2013; Onwubiko, 2010; Srinivasan, 2013; Benlian and Hess, 2011;
	On-demand self-service	Provisioning the software when and as needed without human interaction	Dutta et al., 2013; Mell and Grance, 2011
	Broad network access	Possibility of using the software from any available operating platform or device	
	Resource pooling	Provisioning software for multiple tenants from shared physical and virtual resources	
	Rapid elasticity	Scalable provision of software that corresponds to changes in demand	
Organizational environmental characteristics	Mimetic tendency	Constraining processes, leading an organization to mimic the actions and decisions of other organizations	Benlian et al., 2009; DiMaggio and Powell, 1983
	Decentralized IT decision-making	Organizational governance arrangement where the locus of IT investment decisions and tasks is allocated to business departments (as opposed to a central IT department)	Nault, 1998; Winkler and Wessel, 2018
Affordance outcomes	Organizational agility	Capability of organizations to exploit unexpected changes as opportunities using innovative and rapid decisions; Time gaps between sensing, decision-making, and acting tasks	Jassbi et al., 2014; Liu et al., 2018; Mircea and Andreescu, 2011
	Organizational inertia	Tendency to remain with the status quo and resist strategic renewal outside the frame of the current strategy; Categories: Socio-cognitive, negative psychology, socio-technical, economic, and political inertia	Singh and Hess, 2020, Fitzgerald et al., 2014; Besson and Rowe, 2012;

Recent cloud literature has suggested that organizational resistance and inertia may play a significant role in cloud computing implementations because the cloud delivery model can mean radical change. However, what is new is that this change mainly affects employees in IT roles (Lucia-Palacios et al., 2016). In this sense, cloud computing and SaaS may lead to negative affordances in IT units in multiple ways. For example, using SaaS raises power questions, given that the IT department no longer provides in-house services in the presence of SaaS applications (Khalil et al., 2017). Cloud adoption may affect the managerial accounting of IT departments that view themselves as forced to move to a profit center form to enhance the quality of cloud-based IT provision in the organization (Choudhary and Vithayathil, 2013). The widespread use of externally-provided SaaS questions the "raison d'être" of operational in-house IT capabilities or at least poses the question of which new skills are needed to transition from an internal provider to a mediator of externally-provided services (Luftman and Zadeh, 2011).

Besson and Rowe (2012) reviewed the IS literature to better understand IS-enabled change and classified organizational inertia into five categories: socio-cognitive, negative psychology, socio-technical, economic, and political inertia. We adopted this framework after Stage 1 of the retroductive approach. Socio-cognitive inertia refers to the values and norms inhibiting changes in the existing processes and procedures, whether on the individual, organizational, industrial, or societal level (Besson and Rowe, 2012). Negative psychology inertia is the fear of learning, where threatened agents are overwhelmed by their negative emotions. Socio-technical inertia represents rigidity from the emergent interactions of agents with technology (Markus and Robey, 1988). Economic inertia has been described as resource reallocation spurring and embedding agents into different business models and primarily arises from the sunk, infrastructure, and switching costs. Political inertia is characterized by agents embedded in networks of vested interests where the notion of power is critical (Besson and Rowe, 2012).

Table 1 summarizes the preliminary theoretical concepts that emerged after Stage 1 of the retroductive approach and that informed Stage 2 of the analysis, along with the relevant literature references.

Methodology

We addressed the two-fold research question of how SaaS can enhance organizational agility and which role organizational inertia plays in this process through an interpretive approach based on qualitative data (Klein and Myers, 1999). Interpretive studies "*assume people create and associate their own subjective and intersubjective meanings as they interact with the world around them*" (Orlikowski and Baroudi, 1991, p. 5). This paper aims to understand SaaS affordances by accessing the meanings attributed by employees rather than seeking the objective "truth." We conducted face-to-face interviews with professionals, given that this data acquisition method allows the researcher to investigate different individual interpretations (Walsham, 1995). The analysis focused on SaaS as a delivery model, not on the individual types of software applications.

The interviews were conducted in two stages following a retroductive approach. Retroduction refers to an empirical process that alternates between evidence-informed and theory-driven analytical steps, and uses different forms of logical inference in this process (Mukumbang, 2023). Retroduction constitutes a means of knowing fundamental conditions for the existence of phenomena (Danermark et al., 2005). By interpreting inductively generated findings in the light of theory, the retroductive approach attains knowledge about what relations define a phenomenon (Meyer and Lunnay, 2013). This study employed a retroduction approach in two stages, each involving separate data collection and analysis activities. The first stage consisted of inductive-deductive analysis and was followed by a second stage with deductive analysis, to further enhance the understanding of the emergent concepts.

First stage – Inductive-deductive analysis

First-stage data collection

In the first stage, we conducted interviews with 35 key informants who held various roles, including chief executive officers (CEOs), chief information officers (CIOs), project managers, and IT managers (see Appendix A). Relying on key informants (i.e., employees who possess knowledge about the phenomenon of interest) is a suitable choice in organizational research when in-depth information is necessary and cannot be expected from other sources (Kumar et al., 1993). Managers in business and IT functions are well positioned to serve as key informants about SaaS because they typically have insight into multiple business processes supported by software applications, including those delivered as SaaS. We approached professionals through the alumni network of the first author's university and members of a professional cloud alliance. The main criterion we based our selection of participants on was the experience with one or more SaaS applications in their organizations for more than three years. We decided to focus on interviewing employees from large organizations (i.e., companies with more than 5,000 employees) because an organization's size plays a role in its ability to adapt to changes successfully (Fiss, 2011), and prior literature has indicated that cloud adoption is particularly challenging for larger organizations (Venters and Whitley, 2012; Winkler and Brown, 2013). The organizations in this study represent a broad range of private and public companies from various industries in France, as presented in Appendix A.

The initial aim of this first stage was to explore the organizational outcomes of SaaS in larger organizations inductively. The interview guide (see Appendix B) was structured into four themes: the participants' background and experience; SaaS applications adopted by the organization and the participants' experience with these applications; motivations for and barriers to SaaS adoption; and the effect of SaaS applications on the organization. The first-stage interviews were conducted in person from December 2015 to April 2016 and lasted 59 min on average. All interviews were recorded with the participants' consent and subsequently transcribed. Most of the quotes presented in this paper were translated from French.

First-stage data analysis

Following Elliott and Timulak's (2005) suggestions, we coded the transcribed interviews from a critical, self-reflecting, and skeptical perspective. Two rounds of coding were performed in this first stage. The first coding round started by dividing the data into distinctive units of meaning, representing units that communicate adequate information to readers without context (Elliott and Timulak, 2005). Assessing the data, we inductively assigned various text fragments to a set of codes that emerged from the data. Afterward, we deductively assigned these inductively generated codes to categories resulting from a preliminary literature review (see Appendix C). The second round of coding enabled us to allocate each fragment to a more specific theme and subtheme. For example, the following fragment of text was first assigned to the theme "barriers to SaaS adoption" and subtheme "resistance to change":

> *The majority of our services are stored on our premises, […] and constitute […] investments of almost 100 million euros per year. It is not an easy decision to switch to cloud investment after spending a big amount on internal services. (P10)*

The second round of coding enabled us to reassign this fragment to the newly created subtheme "switching costs" under the "barriers to SaaS adoption" theme. The software NVivo (version 11) was used to support the coding procedures.

After this first stage, we considered the affordance and inertia theory as possible theoretical lenses for the following reasons. First, the codes highlighted the actions enabled by SaaS applications (e.g., easily implemented SaaS services, fast outcomes, and vast resource pools). Second, resistance to SaaS adoption emerged from the data analysis at this stage, emphasizing the possible organizational inertia. Hence, we decided to conduct the second stage through additional interviews to explore how SaaS applications influence organizational agility and lead to organizational inertia considering the chosen theoretical lenses.

Second stage – Deductive analysis

Second stage data collection

For the second stage, we decided to interview the same participants from the first stage, taking a more deductive approach to deepen the insight under the chosen theoretical lenses and obtaining a longitudinal perspective on the inertia and agility outcomes in their organizational settings. The interviews were conducted from November 2016 to March 2017, almost one year after the initial round of interviews, and lasted 50 min on average. Each interview began with validating the first-stage analysis results through a member check. Member checks involve presenting the analyzed and interpreted data to the participants to validate the interpretations and eliminate the researcher's bias (Guba, 1981). The 35 participants were satisfied with the quote interpretations from Stage 1, where only positive feedback was received. Following this, we continued the retroductive approach by asking specific questions.

The interview guide for Stage 2 was based on semi-structured questions related to the main theoretical concepts (e.g., the five organizational inertia categories and agility – see Table 1 and the interview guide in Appendix D). Similar to the first stage, we recorded and subsequently transcribed the interviews with the consent of the participants. For six of the participants, we additionally

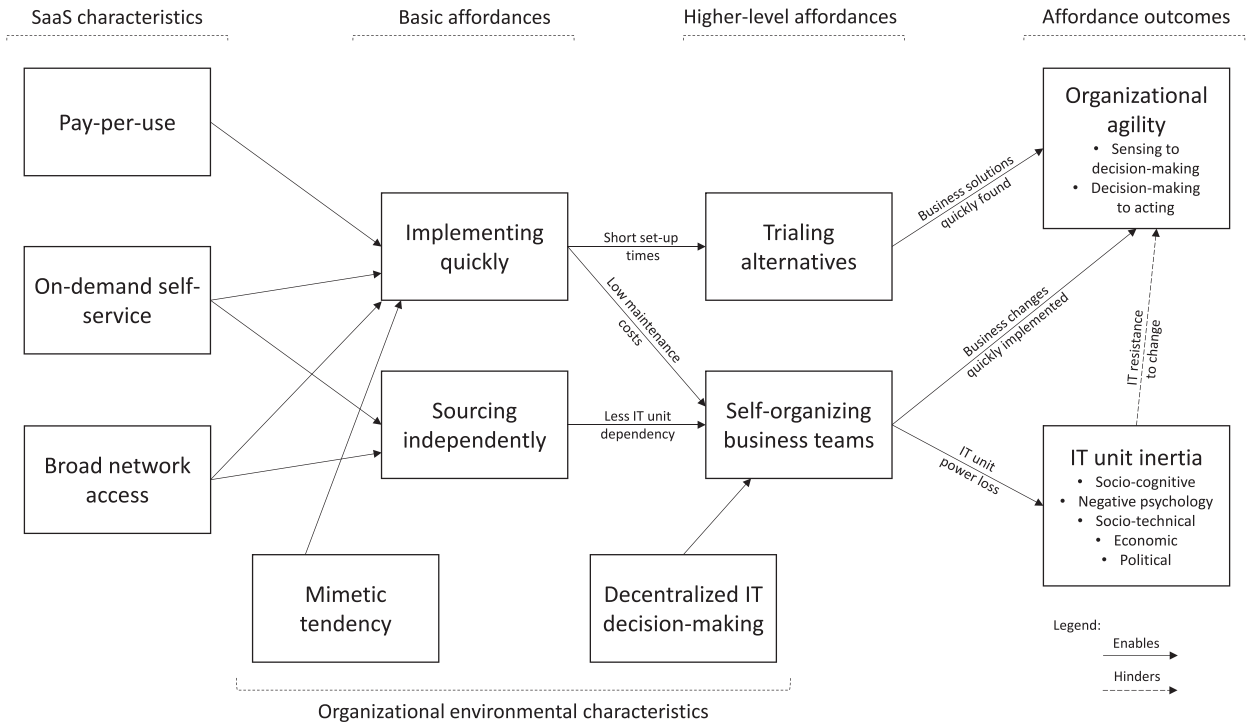

Fig. 1. Emerging affordance framework.

conducted short follow-up interviews at a later stage to clarify any questions that arose during the analysis. In five of these cases, the participants preferred to answer these questions in writing, whereas one agreed to a video interview, which was transcribed and added to the analysis.

Second stage data analysis

In the second stage, we continued the analysis by dividing the transcribed data into distinctive meaning units. We proceeded with the coded themes from the first stage and allocated more text fragments to existing and relevant new themes. For instance, we initially allocated the quote, "*the pay-as-you-go characteristic allows us to try new SaaS applications when needed, and since our marketing department is always innovating, this helps them get fast results*" (P19), in which a participant highlighted that SaaS characteristics afforded them to easily try new cloud applications, to the existing theme "SaaS characteristics." Then, it was moved to the newly emerging affordance "trialing alternatives."

In another example, the quote "*With SaaS, we are at the end of an era where IT departments have the control and sovereignty of internal IT exploitation; there should be a strong psychological adherence to this situation in many IT departments*" (P26) was initially assigned only generally to the theme "barriers to SaaS adoption". However, this participant emphasized the psychological effect created by SaaS adoption; therefore, we re-assigned this fragment to the new subtheme "negative psychology" under the theme "organizational inertia" considering the organizational inertia lens. The coding schemes after Stages 1 and 2 of the analysis are provided in Appendix C.

Results

Fig. 1 represents the emerging framework and illustrates the link between the affordances of SaaS adoption, organizational agility, and inertia. The following subsections describe the relevant SaaS characteristics, basic and higher-level affordances, organizational environmental characteristics, and outcomes.

SaaS characteristics

The basic affordances were derived from three essential SaaS characteristics (out of the five commonly cited characteristics in the literature; see Table 1) in the data: pay-per-use, on-demand self-service, and broad network access. The pay-per-use characteristic allows employees to acquire affordable services for the needed quantity (time and volume), where consumers are charged based on the services used: "*The pay-per-use characteristic is what pushes business units to implement cloud services as it is not expensive for them*" (P31). Through the on-demand self-service option, consumers can acquire SaaS applications whenever they need them with minimal human interaction with cloud service providers: "*On-demand solutions enable users to exploit information in a packaged, organized, industrialized way, with performance and price guaranteed*" (P35). In addition, broad network access allows consumers to use SaaS applications from their workstations, laptops, tablets, or smartphones. The SaaS applications also offer great service quality "*given that they are available 24/7*" (P30).

Basic affordances and immediate concrete outcomes

The three SaaS characteristics are conditions for two basic emerging affordances, as shown in Fig. 1. This section introduces and explains each one.

Implementing quickly

Combining the three essential SaaS characteristics (pay-per-use, on-demand self-service, and broad network service) and the organizational environmental characteristic (mimetic tendency) lead to the first basic affordance: *implementing quickly*. The SaaS applications offer employees flexible and scalable access to software applications, enabling them to acquire solutions when needed immediately. As highlighted by many interviewees, today's busy schedules impose tight deadlines on business departments, propelling them to use any provided help to finish on time: "*Business departments are moving fast, with more work and shorter deadlines, due to the fast-moving market*" (P30). In addition, business departments also face pressure to innovate: "*Business units base their projects on cloud services to create faster, more innovative outcomes*" (P24). Moreover, reducing the need for local word processing and spreadsheet programs illustrates an efficient method of storing data. Employees save time, and their documents have less chance of becoming lost in the cloud, as noted by the CIO of a transportation company: "*When geographically distributed, employees need to share an updated document, the fastest solution is to save it in the cloud, where these or other employees can access it immediately*" (P3).

Faster implementation of new services yields two immediate concrete outcomes (i.e., results of the actualization of affordances): short setup times and low maintenance costs. Participants highlighted that SaaS affords them the possibility to set up applications quickly when new needs arise:

> *Our marketing department is able to get fast results by using, for example, the SaaS application Kimple (P19).*
> *We have been adopting many SaaS solutions because they are easily adopted, and the pay-as-you-go option is very helpful (P30).*
> *The moment we said we wanted a specific SaaS application, we were able to get it and use it (P3).*

Faster implementation of services leads to lower maintenance costs because SaaS takes the burden from companies to perform updates and regular maintenance, which typically constitutes a large percentage of IT spending. Some IT interviewees agreed that on-premise systems result in time-consuming maintenance and costly updates. In contrast, as stressed by a senior IT manager:

SaaS applications do not require any knowledge in updating them. […] Cloud providers do all the 'behind the scenes' work for us. (P6)
We do not deal with any maintenance when it comes to SaaS applications. It is the provider that takes care of it all. (P3)
SaaS applications are delivered as a subscription service, and employees can access them when needed from the cloud while everything is handled by the cloud provider. Therefore, IT employees do not need to keep up with updates and maintenance (P13).

Sourcing independently

The combination of on-demand self-service and broad network access capabilities affords business units the ability to *source independently* from external IT providers. This second basic affordance means employees can immediately acquire the needed application services without going through IT units. For example, a manufacturing CEO confirmed: "*We do not have to wait for permission from the IT department when we need a SaaS solution because we have the needed budget*" (P15). While the ubiquitous nature of SaaS applications enables access to virtual resources, it also allows employees access to a broader choice of application services. As emphasized by another CEO: "*It's normal that the IT department won't be able to fulfill all needs today, with all the offers provided out there*" (P19).

In addition, SaaS allows employees to solve their issues independently from IT units. For example, in a media company:

When the communication department needed to store 50 Terabytes of video files, they informed the IT department that it was bugging on the internal infrastructure. Since it was bugging a lot and they had deadlines, they [the communication department] searched for providers offering large storage capacities and a good quality of service (P23).

Sourcing independently involves a closer relationship between cloud service providers and business departments, and it undercuts IT units that have traditionally managed the IT–provider relationship. As highlighted by the interviewees, "*the cloud vendor and the business departments independently operate and manage their resources*" (P1).

An immediate and concrete outcome of this basic affordance is that business employees are becoming *less dependent on IT units.* Sourcing independently allows business employees to act independently where interdependence between IT and business teams is decreased:

We can now choose the application that we find useful rather than waiting for the IT department to provide an application that does not fully fulfill our needs (P1).
Agility and various characteristics of SaaS have made business employees less dependent on their IT department (P3).

The media and entertainment company CEO explained:

It might sound harsh, but business units are no longer at the mercy of the IT department. It seems like they have the freedom to be independent and simply contact cloud service providers when a SaaS application is needed (P23).

Organizational environmental characteristics

The actualization of two affordances (implementing quickly and self-organizing teams) was influenced by two organizational environment characteristics identified during analysis: *mimetic tendency* and *decentralized IT decision-making.*

Mimetic tendency

Mimetic tendencies of organizations push SaaS implementations and further propel the affordance of implementing quickly. The analysis identified mimetic tendencies in how some organizations aim to become more like their competitors. For example, one interviewee rhetorically asked, "*The other organizations easily implemented this CRM [customer relationship management] application, so why shouldn't we*?" (P1). The senior IT project manager of a high-tech company specializing in digital electronics explained the rise of e-payments and the mimetic tendencies to introduce this SaaS solution: "*When one company uses such a SaaS solution [an e-payment solution], others are pushed to do the same to keep their customers and avoid losing them to competitors*" (P35).

Some IT departments are changing their traditional beliefs and accepting the switch to SaaS applications, given the observed and generated benefits for competitors. Given the example of the popular SaaS platform Salesforce, a CIO explained, "*It is the solution used by all* [*competitors*]*, so I can 'blindly' trust the myriad of benefits generated by this application*" (P5). Another CIO summarized the external pressures that propelled them to use a SaaS application:

Our information system prevented us from being agile, with production running every six months. However, when competitors come looking for you on your core business, waiting six months to launch a single offer is a huge threat for us. We had no choice; we had to move to implementing SaaS applications to gain efficiency and agility (P8).

Decentralized IT decision-making

According to the findings, the locus of decision-making is a second organizational environmental characteristic that affects the higher-affordance *self-organizing business teams*. Multiple interviewees addressed the locus of IT decision-making of the organization: "*The centralization of the IT department is no longer a necessity with the adoption of SaaS, as organizations are witnessing a shift in the sovereignty of IT where business departments act independently*" (P30). In a decentralized organization (i.e., where IT investment decisions are made by different business units in an organization), business employees are empowered to make cloud-related decisions to benefit

their local areas. The CEO of a manufacturing company mentioned the following: "*Within our organization, we have business units that make their own decisions, regardless of their IT department*" (P15). The CIO of a utility company supported this idea: "*Business employees decide whether they want to move to the cloud or use our on-premise infrastructures. For example, they are the ones who discussed and decided to acquire SaaS solutions like Salesforce.com*" (P13).

Structural decentralization encourages business departments to act in a self-organizing manner, as highlighted by a CEO: *"Our business departments are able to act independently given the decentralization of our organization and the budget allocated to each department"* (P22). Another business leader affirmed: "*We are able to contact cloud providers directly because we have an allocated budget, and our organization is actually decentralized*" (P21). When decentralization prevails within an organization, business units gain flexibility as their needs are fulfilled. The CIO of a utility company explained: "*Quick changes will occur as advances in technology happen; that is why our flexible organization will succeed as it can adapt to these fast changes*" (P12).

In contrast, for centralized organizations, business teams are less self-organizing, as explained by a participant (P2), *"The decision-making process is a long road as it includes many steps with a lot of administrative work, such as asking for approval at every single step."* Another CIO agreed, mentioning that *"the process for approving any IT investment is very lengthy"* (P11). Organizations with a centralized decision-making process are prone to accepting central policies, hindering the ability to have self-organized business teams.

Higher-level affordances

Trialing alternatives

A higher-level affordance emerged from the actualization of implementing quickly and the immediate concrete outcome of a short setup time: *trialing alternatives*. It refers to the ability to test solutions from SaaS vendors and potentially switch vendors. Given the quick implementation, employees can trial applications from a wide selection. Employees often switch to another if the chosen application does not suit their expectations or demands more advanced skills. In this sense, SaaS applications can be tested and experimented with before committing to adopting them. For example, the CEOs of media-entertainment and manufacturing companies shared their experiences concerning trying alternatives: "*We got visits from three cloud providers regarding a CRM solution. We were able to try one solution before sticking to the second provider's solution*" (P23). Switching from one SaaS application to another can be easily achieved: "*We were able to switch from Google Drive to Dropbox Business, which was more satisfying*" (P32).

Trialing alternatives affords business units the ability to improve business solutions as needs change. The immediate concrete outcome of actualizing the trialing alternatives is the ability to determine business solutions quickly. The CIO of a utility company recalls: "*We needed to find a solution to deal with the engagement of our stakeholders and customers. After several attempts, we found one and have been using it ever since*" (P13). Another CIO attests to the link between trialing affordance and organizational agility:

> *We tried SaaS applications and signed a monthly contract with some cloud providers. If we liked the application, we kept it and renewed the contract to a yearly one. If we found that the application was not very efficient and not suitable for our processes, then we switched to another one. I think this explains how finding pertinent solutions yields increased agility in our company (P3).*

Self-organizing business teams

Another higher-level affordance that emerged from the analysis because of the actualization of sourcing independently and implementing quickly, facilitated by decentralized IT decision-making, is *self-organizing business teams*. Self-organizing business teams work independently without the need to coordinate with IT units even beyond sourcing: "*We saw a faster implementation, we saw our business teams being more independent and not fully relying on the IT department, and as I mentioned, the implementation of SaaS happened incrementally*" (P3). Some IT stakeholders confirmed that "[*Business departments*] *do not require the IT department's help for developing new services*" (P13). The CIOs of higher education and manufacturing companies agree that, by implementing SaaS applications, "*business teams are the ones who decide what to do, whenever they want to do it, and however they want to do it*" (P33), and "*no one outside their team can dictate them otherwise*" (P26).

Business employees, particularly those in companies with more decentralized IT decision-making, tend to make decisions autonomously – such as determining which application to implement, which cloud service provider to contact, and how long they need a specific application, regardless of their IT department policies. A business leader affirmed that "*organizations today are witnessing a shift in the sovereignty of IT where business departments act independently*" (P32).

Self-organizing business teams yield two immediate concrete outcomes, one desirable and the other adverse: *business change quickly implemented* and *the loss of power of IT units*. Due to self-organizing business teams, business departments can adopt such services independently and freely when needed and can work flexibly: "*Thanks to the flexible nature of the cloud, our business units are capable of adopting SaaS applications independently*" (P1). The flexibility offered by SaaS allocates more freedom to employees when in doubt and enables them to implement business changes quickly when needed. A participant confirmed the link between self-organizing teams and organizational agility:

> *Our business teams implement faster today. They have become more independent because of SaaS and its characteristics. For our company, agility means being able to change quickly if the exterior environment is propelling us to [do so]. This is why I believe the different SaaS applications have given us a bigger push to become more agile (P13).*

On the downside, the second immediate outcome of self-organizing business teams is losing the power of IT units. Many IT employees admitted that adopting cloud services yields a loss of control in the decision-making process, as highlighted by some interviewees: "*SaaS applications deprive some power of the IT department*" (P5). One interviewee predicted that "*the traditional IT*

department will gradually disappear" (P28). Self-organizing business teams threaten the power of IT units, especially in organizations with otherwise centralized IT decision-making. The CEO of a manufacturing company with a decentralized IT noted that "*the IT department is no longer in total control of the decision-making process in the organization. Especially with the presence of all the different cloud solutions offered by providers*" (P15).

Table 2 displays the basic and higher-level affordances, the conditions for their actualization, and the actions needed to actualize them. Further exemplary quotes regarding the basic and higher-level affordances and their immediate concrete outcomes are provided in Appendices G and H.

Affordance outcomes

Organizational agility

As displayed in our framework (Fig. 1), organizational agility results from actualizing the higher-level affordances of trialing alternatives and self-organizing business teams. The goal-oriented actions taken by employees regarding SaaS in the interviewed organizations ultimately aim at enhancing organizational agility. Our findings suggest that the two immediate concrete outcomes of finding business solutions and implementing business change are key levers to reduce the time gaps between sensing and decision-making, as well as decision-making and acting. In a nutshell, "*what used to take six months or even two years with traditional IT solutions, today takes two or three days with the SaaS technologies*" (P16).

Between sensing and decision-making, SaaS helps organizations speed up the times from sensing a need to deciding on an adequate action. For example, the business team of a retail company reacted to changes in the market by trialing different alternatives and quickly deciding on a specific SaaS that would solve their issue: "*We discovered a segment that was not really addressed by retail companies and decided to be quick. After our R&D department looked at possible opportunities, we decided to implement a SaaS application*" (P5). Similarly, SaaS allowed a postal service company to quickly react to customer complaints:

> *When we sense our customers believe that our services are slow, then we take these opinions into consideration and try to quickly find a solution. This happened recently, when we decided to implement a SaaS application … because our customers were complaining that our services were bugging a lot (P20).*

We thus observe that it is primarily the immediate concrete outcome of trialing different alternatives that enables companies to discover a suitable solution when they sense a specific market need. Companies largely skip over the traditional phase of analyzing requirements, requesting information from vendors, and waiting for the vendors' responses when considering SaaS. Quickly finding solutions has positive implications for business agility as reflected in the quote by a CIO of a utilities company:

> *The nature of SaaS applications has given employees more freedom and faster solutions […] So, we needed to find a solution to deal with the engagement of our stakeholders and customers. After several attempts, we found [a specific SaaS CRM solution] and we've been using it ever since (P13).*

Regarding the time gaps between decision-making and acting, the SaaS delivery model enhances agility by enabling faster implementation of business decisions. This is due to the fact that business teams who take charge of the implementation in a self-organizing manner become more equipped to utilize these applications. For example, a transport company representative stated, *"the moment we said we wanted a specific SaaS application, we were able to get it, and use it"* (P3). Compared to traditional software implementation where users are trained before a solution would be released to them, SaaS-enabled business teams not only drive the software selection but can start using the solution from day one, even if the implementation is not fully completed yet. Quick implementations can lead to competitive advantages. The retail company that had spotted an unaddressed market segment, capitalized

Table 2
Affordances of SaaS: definitions, conditions, and actions.

Affordance	Definition	Conditions	Actions to actualize the affordance
Implementing quickly	Ability to acquire cloud solutions when needed immediately	Technology: pay-per-use, on-demand self-service, and broad network access Actors: business units acquire SaaS services autonomously and immediately Context: Users have a budget for SaaS implementation	Business units acquire SaaS services when needed from a wide selection of services offered by cloud service providers
Sourcing independently	Ability to acquire application services from cloud service providers without going through IT units	Technology: on-demand self-service and broad network access Actors: business units act independently, decreasing interdependence between IT and business teams	Business units perform functions via adopted SaaS services
Trialing alternatives	Ability to test solutions from SaaS vendors and switch vendors if needed	Outcomes from lower-level affordance: reduced time-to-market	Organizations try new applications through fast implementation and a wide selection of SaaS applications
Self-organizing business teams	Ability to work independently without the help of other agents (IT units)	Outcomes from lower-level affordance: needed services acquired immediately and independently; low maintenance costs Context: Decentralization	Business units disregard internal powers and make decisions autonomously regardless of IT units' wishes and orders

on its speed of reacting to the market change because the SaaS solution *"enabled us to capture the market share before our competitors … Our time-to-market was 6 or 7 months faster than our competitors"* (P5). Another example is a public insurance company that faced uncertainty about the demand for a new benefits application and, through cloud technology, was able to cope with this uncertain demand in a cost-effective way:

> *There was a great deal of uncertainty about how many people would apply for benefits. I was told that it could be 200,000 people or three/to four million. To mount architecture, if you have to go up to three or four million and use it for only 200,000, you are just throwing money in the air; if you put it for a million and there are four million, your infrastructure does not support that amount, creating hence several issues. We thus used a cloud SaaS solution in addition to an IaaS solution (P10).*

Overall, our interviews affirm that SaaS aids companies in expediting the process from sensing to acting, thereby enabling them to attain tangible business benefits. The retail CIO concludes: *"We can say that SaaS applications helped us gain more agility. For instance, [SaaS CRM] has enabled us to offer personalized experiences for our customers whenever needed"* (P5). The media and entertainment CEO confirms, *"SaaS applications … enable us to be more responsive to our customers and more scalable, which is saving us money"* (P23). Additionally, the utilities CIO concludes:

> *Being agile means being able to move quickly. For our company, it means being able to change quickly if the exterior environment is propelling us to. This is why I believe that the different SaaS applications that we have adopted have given us a bigger push to become more agile (P13).*

However, enhancing acting agility through SaaS also involves the need to reassess the role and responsibilities of internal IT units. The utility company *"decided to move some processes or like in-house applications to the cloud because of the flexibility and low cost of software-as-a-service."* However, the CIO stated that they *"had to make a plan dictating what that actually meant for our company. We knew that some of our IT employees had to change their responsibilities and change what they were doing*" (P13).

IT unit inertia

Not all IT units equally embrace SaaS as an IT and business change accelerator. We found that SaaS affordances have the desired outcome (agility) as well as an adverse outcome, presented by the *inertia of IT units*, slowing cloud implementation processes and impeding organizational agility. The actualization of the higher-level affordance of *self-organizing business teams* leads to such inertia. We classified inertia outcomes using the five categories of inertia proposed by Besson and Rowe (2012): socio-cognitive, negative psychology, socio-technical, economic, and political.

Socio-cognitive inertia: The participants highlighted that SaaS solutions, such as collaboration and communication, can lead to the defragmentation of their organizations and a change in daily routines. However, some IT units rejected the idea of having too many departments communicating and working together on the same platforms. They affirmed that fragmentation works perfectly well for them:

> *Our departments are fragmented, which is a great cause for why each one works on their own projects. I feel SaaS adoption can change this into a more open collaborative work, which is something we do not wish to deal with for the moment (P2).*

Some participants emphasized the importance of this fragmentation and explained its necessity within their organization. For instance, an IT director of a governmental agency emphasized: "*As a public entity linked to the prime minister, we are not ready to be collaborating with the communication or marketing entities, for example*" (P27).

The CIO of a manufacturing organization described the difficulties encountered in communicating across business departments:

> *We do not possess the same 'language' across the whole organization, given that we do not possess the same context. So, if different business departments, for example, HR, marketing, and production departments, have to work together once a SaaS application is implemented, they might not all be in agreement (P16).*

These IT stakeholders emphasized how they fight the proliferation of SaaS because of the possible defragmentation it creates. Some IT units stressed that, although familiar with the benefits of SaaS applications, they would prefer to continue their old routines. For instance, as the CIO of a retirement insurance company mentioned, "*It is clear that cloud computing increases organization performance and agility, but we like our routines; they are the roots of our work*" (P11). The CIO of a manufacturing organization provided another example of socio-cognitive inertia: "*We are aware of the advantages of switching to e-invoicing applications, yet we consciously continue to use the prevailing invoicing system in our organization. Employees in our departments feel comfortable with familiar situations*" (P16). The IT participants also highlighted that changing daily routines for employees is not easily achieved and that managers should expect their employees to react to radical changes. A CIO in banking stated, "*We know that adopting SaaS services in our organization will make our life easier, but it is not easy imposing that on employees who have been doing the same job for the past 30 years*" (P7).

Negative psychology inertia: The second inertia dimension, highlighted mostly by interviewees with IT roles, is negative psychology. The emergence of cloud services, specifically SaaS, leads to reskilling pressure. The IT participants highlighted that "*new professions and careers emerge from the digital transformation, specifically with digital competencies*" (P6), emphasizing "*the need to develop new skills matching the new jobs, in order to avoid obsolete skills*" (P21). Organizations today are searching for a "*cocktail profile*" (P3), where IT employees must have "*good knowledge in IT and business at the same time*" (P3). Stress over losing their jobs propels IT employees to become aware of the importance of reskilling: "*We know that in order to follow the digital path, we need to develop new critical competencies*" (P10). Therefore, this vital prerequisite overwhelms anxious and tense IT employees, as highlighted by the senior IT project manager of an insurance organization: "*The popularity of SaaS applications stresses CIOs, in particular, who should not only be satisfied with*

their IT knowledge but should expand it and earn some business knowledge as well" (P6).

In addition to the overwhelming stress, IT employees are worried about job security: *"We have witnessed many employees in our IT teams complain about SaaS technologies, fearing that these applications will replace their jobs"* (P3). As the skills of IT employees are becoming *"obsolete"* (P9) and *"old jobs are disappearing, giving place to new ones"* (P13), it is challenging for these employees to *"accept SaaS applications as allies and not enemies"* (P27). While business departments work as self-organizing business teams, their fast implementation and adoption of SaaS applications threaten the role and standing of IT employees. The interviewees highlighted the following: *"With SaaS, we are at the end of an era where IT departments have the control and sovereignty of internal IT exploitation; there should be a strong psychological adherence to this situation in many IT departments"* (P26). However, some interviewees stressed that they could not adhere to these changes. The CIO of a bank company explained that it is challenging to train relatively older employees: *"Employees, who have been working for the past 30 years, their jobs will be replaced by cloud services. After using their competencies for 30 years, they do not accept adapting to the cloud and hence learn new skills"* (P7).

Socio-technical inertia: The socio-technical dimension of inertia occurs due to the coalition of social entities with technology artifacts. Technical inertia is illustrated by the data stored in the cloud, and the users concerned with this data illustrate inertia. For example, when business employees store their files in the cloud, there is a fear that the security of the data can be compromised. While business departments wish to use SaaS, IT employees resist because of data security concerns: "*We obviously see SaaS solutions as a threat and hence are resistant to it*" (P3). Of the interviewed organizations, public organizations immediately played the security card, stating that "*adopting public cloud solutions is not the best choice*" (P2). In addition, financial organizations claimed they are decelerating the SaaS adoption because they have "*several governmental secrets that need to stay protected, and thus, we cannot go towards cloud computing*" (P24). Given the many security breaches occurring in Europe, French organizations are very careful about storing sensitive data in non-European countries because they need "*full control of sensitive data*" (P27) and because "*organizations do not wish to put data outside the Eurozone*" (P15). For many organizations, "*customers' sensitive data are extremely valuable*" (P10). Socio-technical inertia inhibits organizations from enhancing their organizational agility by enacting SaaS affordances.

Economic inertia: The IT department often opposes implementing cloud services for economic reasons. These findings highlight that IT units are embedded in business models that have their own dynamics emerging from resource reallocation: "*The majority of our services are stored on our premises, on internal machines and infrastructures. This is because we have numerous infrastructures, which constitute half of our IT budget*" (P10). Thus, paradoxically, they cannot afford to switch to a cloud environment because they wish to amortize their infrastructure costs: "*Since we possess our own infrastructures and we exploit them, the organization is always thinking 'infrastructure;' it is 'infrastructure,' and its services are 'infrastructure.' The organization becomes fully immersed and fully invested in its infrastructure*" (P31). This situation leads to the high switching costs witnessed by the participants. Heavy investments would be needed if organizations consider moving to a cloud environment. Given that building infrastructure on the organization's premises is not an easy task, IT departments remain hesitant:

> *Forty years ago, we went through the trouble of building infrastructure, buying servers, acquiring licenses, modifying our processes, and all that for a high cost: money and time. We cannot just let all of this go and simply move all our services to the cloud. It is a long and costly process (P27).*

Political inertia: The findings also highlight the emergence of vested interests and alliances. Business employees feel that they *"possess new powers through the cloud, and specifically through shadow IT, where [they] do not really need the IT department to get software"* (P1) and that *"the IT department is no longer in total control of the organization, more specifically, control of the decision-making process in the organization"* (P32). When IT leaders feel that their traditional roles are slowly disappearing and being replaced with cloud services, they feel threatened by this loss of control. Hence, political inertia arises. Although some IT employees are losing power with the advent of SaaS, others are motivated to regain it. Even in the presence of SaaS applications, many interviewed IT employees explained how their department reclaimed power over technology. They elaborated on how this can be achieved by centralizing their IT governance. For instance, three CIOs explained that *"the IT department controls anything related to IT"* (P5), that business departments need *"to get the [IT department's] permission before seeking solutions from cloud providers"* (P3), and that they *"are not allowed to go behind the IT department's back and contact cloud providers on their own"* (P8). Centralizing IT decisions at the IT department level inhibits business employees from contracting out to cloud service providers. One CIO mentioned, *"Allowing our business departments to get SaaS solutions from cloud service providers means our IT department needs to pass the 'decision hand' to the business departments, but we will not allow this due to internal and external political reasons"* (P11). Therefore, political inertia emerges to stop business employees from gaining power over IT and resisting internal changes.

As illustrated in Fig. 1, the immediate outcome of inertia is *IT resistance to change.* Many IT participants affirm that they are "*resisting the need to adopt SaaS applications*" (P2) regardless of the "*business departments' demands*" (P5). A CIO explained that "*if all demands were met through the implementation of SaaS tools, then the IT department might become obsolete, a situation to avoid in a large organization like ours*" (P5).

In summary, inertia exerted by IT units can impede organizational agility. For instance, the CIO of a banking company explained how the "*cloud adoption process that remains slow*" within their organization is "*impacting their organizational agility*" (P7). Other participants claimed that, due to the resistance caused by the IT department, they are "*not capable of reaching the desired organizational agility*" (P4).

Discussion

In this research, we set out to study how SaaS affords organizational agility in large organizations. The principal motivation was the lack of prior empirical work exploring the mechanisms of how specific cloud service models, such as SaaS, are related to organizational

agility. The primary outcome is an emerging theoretical model depicting two basic affordances, two organizational environmental characteristics, and two higher-level affordances provided by SaaS adoption. The model relates the higher-level affordances to organizational agility outcomes and IT unit inertia.

Four affordances emerged from this work. The SaaS characteristics (pay-per-use, on-demand self-service, and broad network access) enable two basic affordances, *implementing quickly* and *sourcing independently*. The actualization of these basic affordances leads to two higher-level affordances, *trialing alternatives,* and *self-organizing business teams*. The facilitating conditions for the affordances of implementing quickly and self-organizing business teams are provided by two organizational environmental characteristics: *mimetic tendency* and *decentralized IT decision-making*, respectively. While the actualization of trialing alternatives yields the desired outcome of organizational agility, the actualization of self-organizing business teams simultaneously leads to organizational agility and inertia. In turn, IT unit inertia impedes organizational agility.

These novel affordances are different from what cloud computing has been designed for. Originally, SaaS was intended to access scalable resources with minimal management effort and minimal service-provider interaction, as noted by Mell and Grance (2011). Therefore, SaaS was not intended to enable the independency of business units from their IT department. This highlights the novelty of our results. We proceed by discussing the four main findings from our emergent model.

Model findings

First, the proposed model unveils how SaaS characteristics enable organizational agility through a chain of lower- and higher-level affordances and their respective immediate concrete outcomes as mechanisms connecting these affordances. Previous research has suggested that cloud characteristics enhance organizational agility (Garrison et al., 2015; Kathuria et al., 2018; Liu et al., 2018). While the literature has found organizational agility to be a central organizational outcome of cloud adoption, including at the IaaS and PaaS layers, the literature has lacked insight into how the *SaaS* model may enhance organizational agility. Through the emergence of affordances, this research work explicitly describes how SaaS adoption can accelerate the process from sensing market changes to implementing business decisions (Park et al., 2017). The findings reveal how SaaS enables self-organized business units to contribute to agility by quickly finding adequate solutions for their business needs. Being able to trial multiple alternatives speeds up time from sensing to decision-making, and implementing changes quickly reduces the time from decision to action. As a result, companies are better equipped to respond to unpredictable market demands and gain a competitive edge.

The emergent model for SaaS exhibits similarities to the PaaS-level affordance model presented by Krancher et al. (2018) in two immediate concrete outcomes. The *short setup time* identified as an immediate concrete outcome linking the *implementing quickly* and *trialing alternatives* affordances in the proposed model is similar to the *reduced wait time* outcome identified by Krancher et al. (2018). Additionally, the *less IT unit dependency*, the immediate concrete outcome linking the *sourcing independently* and *self-organizing teams* affordances, has similarities to the *reduced dependency on infrastructure teams* identified by Krancher et al. (2018). Additionally, the higher-level *self-organizing business teams* affordance we found for SaaS parallels the *self-organization* findings by Krancher et al. (2018), where IT developer teams make spontaneous and autonomous PaaS-related decisions instead of following hierarchies. Nevertheless, whereas Krancher et al. (2018) addressed the *self-organizing* affordance for IT development teams, we identified that SaaS applications allow business teams to be more self-organized. Moreover, while we observe a direct connection between *self-organizing teams* and *organizational agility*, for the PaaS-level model of Krancher et al. (2018), an indirect connection links them by *triggering continuous feedback*. While some similarities were identified between these two models, a significant difference emerged. Through SaaS adoption, we found a prominent role of *organizational inertia* within IT units, which was not salient to the PaaS-level study by Krancher et al. (2018).

Second, the findings suggest that mimetic tendency, an organizational environmental characteristic, influences cloud adoption due to a basic affordance illustrated in the emergent theory (implementing quickly) and actualized by an immediate concrete outcome of this affordance (the short setup time). Early SaaS research has demonstrated that companies based their choices for SaaS on others' social influence (Benlian et al., 2009). However, academic studies have rarely recognized the potential of the SaaS service model to allow a fast implementation for organizations and hence a short setup time by switching from one cloud service provider to another as well as from one SaaS application to another. A short setup time enables businesses to quickly determine applications that best suit their teams, enhancing organizational agility. We highlight this point because agility enables organizations to exploit unexpected changes as opportunities through fast, innovative decisions. The findings resonate with Venters and Whitley's (2012) conjecture that the "*scalability of cloud solutions allows trialing of niche services in an agile manner with low risk*" (p. 190). Therefore, this research highlights how mimetic tendencies, a faster SaaS implementation, and the option to try new SaaS applications enhance organizational agility.

As a third finding, decentralized IT decision-making is an environmental characteristic that favors organizational agility by facilitating self-organizing business teams (a higher-level affordance), yielding a loss in IT unit power and faster business change implementation—the two immediate concrete outcomes that emerged from this affordance. Including the governance variable (i.e., decentralized IT decision-making) contributes to the literature that links the emerging cloud governance literature (e.g., Choudhary and Vithayathil, 2013; Winkler and Brown, 2013) to agility outcomes. The findings reveal that more decentralized decision-making enables faster business change implementation and contributes to organizational agility. For instance, teams in large organizations can become independent of their IT units when adopting SaaS applications. The findings align with the work by Park et al. (2017), who claimed that decision-making is a crucial task for enhancing organizational agility. This study reveals that decision-making is facilitated in decentralized governance, leading to improved organizational agility. This work suggests expected changes in employee behavioral patterns and work balance. Business teams seem to be working autonomously while potentially circumventing the policies

of their IT departments. The emergence of self-organizing business teams has been coupled with a disregard for internal power. Because these teams do not depend on their IT departments, decisions can be made solely by the self-organized business teams. These findings align with those from Winkler and Brown (2013) and Choudhary and Vithayathil (2013), who addressed IT governance questions when adopting cloud services and claimed that cloud adoption affects IT departments. However, this study goes beyond the work of these authors because it creates an indirect link between decentralized IT decision-making and organizational inertia. Thus, this work highlights that, while decentralized IT governance enables self-organizing business teams, it can also lead to the emergence of organizational inertia within IT units due to the immediate concrete outcome, the *loss of power of the IT unit*.

As a fourth major finding, various categories of *inertia* result from SaaS affordances as barriers to organizational agility. Applying the inertia lens enabled this research to highlight the inertia of IT departments aiming at slowing the SaaS adoption processes within their organizations. The study provides evidence of all five types of inertia suggested by Besson and Rowe (2012). Socio-cognitive inertia rises when IT units must change their daily routines due to SaaS adoption, which propels them to adopt new working methods. Negative psychology inertia causes IT units to resist SaaS applications and prevents the organization from implementing them. When IT units seek to maintain the status quo within their departments and organizations, socio-technical inertia emerges, making these employees technologically challenged by SaaS applications. Economic inertia locks in organizations through the coercive effects of switching costs (from internal infrastructure to outsourced cloud services). The SaaS adoption yields political inertia because it challenges decision-making by including various organizational parties.

Some findings on inertia in prior cloud literature include socio-technical and economic inertia. For instance, Armbrust et al. (2010), Dutta et al. (2013), and Srinivasan (2013) identified data security (i.e., socio-technical inertia) as a significant inhibitor to cloud adoption by IT units. In addition, this work aligns with the study by Lucia-Palacios et al. (2016), connecting cloud adoption with economic inertia. However, the current study portrays the other types of inertia as newly emerging concepts applied to SaaS, extending the research on cloud-related organizational inertia.

Theoretical contributions

Overall, this research makes three crucial theoretical contributions. First, the results contribute to the extant literature on IT and organizational agility (Tallon et al., 2019) by exploring the role of a specific cloud service model (SaaS) in the ability of firms to react to business change. This literature explored different technology-related antecedents of organizational agility, including IS development (Abrahamsson et al., 2009; Conboy, 2009), IT platforms enabling increased customers (Bhatt et al., 2010; Sambamurthy et al., 2003), and IT infrastructure (Fink and Neumann, 2007; Tallon, 2008). However, no research had examined the causal chain in which SaaS applications are a technology catalyst for organizational agility.

This theory extends the organizational agility literature by understanding the mechanisms through which SaaS affordances enhanced organizational agility. For instance, sourcing independently enables a more adapted environment for business units because self-organizing business teams lead to organizational agility gains. The results also align with the work by Park et al. (2017), who highlighted the role that IT plays in achieving organizational agility. However, while their study revolves around various types of IS, the current study addresses this relationship with SaaS technology, representing a delivery model innovation that is independent of specific application types.

Second, the results offer novel insight into the affordance literature. Gibson (1966, 1977) emphasized the importance of closer communication with the organizational environment when dealing with the affordances of actors. Prior affordance researchers equally diagnosed a lack of investigations regarding how work environment characteristics interact with the change process facilitated by IT (Vidgen and Wang, 2009). The work exposes how two organizational environmental characteristics affect the actualization of technology-induced affordances. Mimetic pressures propel business teams to quickly implement new SaaS services from the expansive pool of existing applications. Decentralized IT decision-making is an organizational environmental characteristic that facilitates organizational agility through self-organizing teams. Thus, this work demonstrates the importance of considering organizational environmental characteristics in research on technology affordances in IS. Future IS research may seek to productively integrate the concept of organizational environmental characteristics when exploring technology affordances.

Third, this research contributes to the organizational change literature in IS by unveiling the existence and importance of IT unit inertia. Extant literature has traditionally focused on organizational inertia related to the user side of IS (e.g., Kim and Kankanhalli, 2009; Klaus and Blanton, 2010), whereas our findings indicate inertia related to the IT unit staff as a salient affordance outcome that hinders organizational agility. Besson and Rowe's (2012) review highlighted that research on IS-enabled organizational transformation has addressed inertia dimensions primarily concerning application technology trends, such as business process reengineering, enterprise resource planning, and e-commerce, while it revealed a dearth of insight into cloud computing and SaaS. Our findings highlight how all five types of inertia (socio-cognitive, negative psychology, socio-technical, economic, and political) can also apply to actors on the *provider* side of IS provision (e.g., internal IT units). Future organizational change research in IS should focus on the possible inertia in IT-provider organizations and formulate ways to address resistance to change by these actors within and beyond a cloud computing context.

Practical implications

This study proposes two important practical implications for organizations that adopt SaaS applications. First, understanding the links between SaaS technical characteristics and organizational agility can help managers better exploit SaaS. Knowing which mechanisms lead from one affordance to another enables organizations to ensure these affordances are enacted. In particular, this work

emphasizes the importance of providing an adequate organizational environment that grants business units a degree of freedom that allows them to self-organize and try various IT solutions in an agile manner. Thus, this work can help managers leverage SaaS to enhance organizational agility.

The second practical implication of this study is related to organizational inertia. As described in this work, the adoption and implementation of SaaS applications can create resistance by IT employees, yielding the emergence of organizational inertia. Managers are advised to devise ways of making their IT units part of the organizational cloud journey. This can be achieved, for example, by making the sourcing of applications through the cloud the preferred option strategy in the sourcing strategy, offering training on cloud management for IT employees, and developing new competences and skills for career paths in the digital age. Knowing the different types of inertia should help organizations deal with such adverse outcomes instead of being shortsighted when adopting SaaS applications.

Limitations

The following four limitations of this research merit consideration. First, our emerging theory is based on data collected from organizations in France sharing a similar culture and behavior. Therefore, further studies can apply this research and framework to different cultures and countries. Second, we focused our study on organizations with over 5,000 employees and positioned the theoretical framework as being applicable to large organizations. It is conceivable that smaller companies and startups experience different affordances and potentially lower levels of inertia since they have less firmly established work routines. Third, our research design favored depth over breadth in that we interviewed the same informants twice, which was required from a theory integration and adaptation standpoint. Future research might adopt a case study lens to tease out further organizational environmental characteristics that influence SaaS affordances. Fourth, while our focus on analysis was on SaaS as a delivery model innovation, the strategic intent behind the implementation of each SaaS application was not in the scope of this research. However, the mechanisms that lead to agility may vary depending on the underlying motivations of the organizations. Thus, future research might untangle the potential differences in the affordances of different types of SaaS implementations.

Conclusion

While organizational agility has been acknowledged as a crucial underpinning for the survival of organizations (Liu et al., 2018; Mircea and Andreescu, 2011), the mechanisms that lead to organizational agility in cloud-adopting organizations have remained underexplored. This work unveils which basic and higher-level affordances are enabled by three SaaS characteristics. These characteristics help teams become independent of their IT units and enable faster implementation of SaaS applications, enhancing organizational agility. In addition, IT unit inertia was identified as an adverse affordance outcome that acts as a hindering mechanism to achieving organizational agility. Overall, this work contributes to the organizational agility, affordance, and organizational change literature in IS by unveiling how the adoption of SaaS applications can enable organizational agility while underscoring the role of IT unit inertia in the SaaS affordance actualization process.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A:. Participants' details

Ref.	Unit	Role	Industry	Sector	IT Decision-Making	Examples of adopted SaaS	Employees
P1	Business	CEO	Research Centre	Public	Decentralized	Microsoft Office 365, Google Analytics	5,000
P2	IT	CIO	Retirement Insurance	Private	Centralized	Oodrive, GoToMeeting	12,000
P3	IT	CIO	Transport	Private	Decentralized	Yammer, Google Apps	82,000
P4	IT	Senior IT project manager	Transport	Private	Centralized	Oodrive, Payfacile	31,000
P5	IT	CIO	Retail	Private	Centralized	Salesforce, Kimple	330,000
P6	IT	Senior IT project manager	Insurance	Private	Decentralized	Dropbox, Microsoft Office 365	166,000
P7	IT	CIO	Banking	Private	Centralized	Oodrive, Kimple	250,000
P8	IT	CIO	Media and Entertainment	Private	Decentralized	Zendesk, Microsoft Office 365, Novapost	6,000
P9	IT	Cloud computing project manager	Insurance	Private	Decentralized	Yammer, Google Apps	117,000
P10	IT	CIO	Family Insurance	Public	Centralized	Amazon Web Services	8,000
P11	IT	CIO	Retirement Insurance	Public	Centralized	Kimple, Payfacile	7,000
P12	IT	CIO	Utilities	Private	Decentralized	Zendesk, Google Apps	159,000
P13	IT	CIO	Utilities	Private	Decentralized	Salesforce, Google Apps	152,000

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(*continued*)

Ref.	Unit	Role	Industry	Sector	IT Decision-Making	Examples of adopted SaaS	Employees
P14	IT	CIO	Manufacturing	Private	Centralized	Oodrive	64,000
P15	Business	CEO	Manufacturing	Private	Decentralized	Nelis, Dropbox	60,000
P16	Business	CEO	Tax Declarations	Public	Centralized	Google Apps, Kimple	10,000
P17	IT	Senior IT project manager	Utilities	Private	Decentralized	Digitaleo, Google Apps	176,000
P18	Business	Senior project manager	Healthcare	Private	Decentralized	Oodrive, Kimple	38,000
P19	Business	CEO	Manufacturing	Private	Decentralized	DocLabs, Kimple, Gmail	86,000
P20	IT	CIO	Postal Services	Private	Decentralized	Google Apps, Kimple	251,000
P21	Business	Cloud computing project manager	Utilities	Private	Decentralized	Google Apps, GoToMeeting	130,000
P22	Business	CEO	Manufacturing	Private	Decentralized	DocLabs, Kimple	87,000
P23	Business	CEO	Media and Entertainment	Private	Decentralized	Digitaleo, Microsoft Office 365	9,000
P24	IT	CIO	Telecommuni cations	Private	Decentralized	Salesforce, Microsoft Office 365	155,000
P25	IT	CIO	Power Transmission	Private	Decentralized	Microsoft Office 365, GoToMeeting	9,000
P26	IT	CIO	Manufacturing	Private	Decentralized	GoToMeeting	172,000
P27	IT	CIO	First Minister Services	Public	Centralized	Todoist	11,000
P28	IT	CIO	Public Action	Public	Centralized	Digitaleo	10,000
P29	IT	CIO	Financial Services	Public	Centralized	Todoist, Kimple	138,000
P30	Business	CEO	Retail	Private	Decentralized	Zendesk, GoToMeeting	99,000
P31	IT	SeniorIT project manager	Bank	Private	Centralized	Payfacile, Dropbox	65,000
P32	Business	CEO	Manufacturing	Private	Decentralized	Salesforce, Microsoft Office 365, Dropbox Business	94,000
P33	IT	CIO	Higher Education	Public	Decentralized	Outlook Web Access, Zendesk	6,000
P34	Business	CEO	Manufacturing	Private	Decentralized	Salesforce, Kimple	11,000
P35	IT	SeniorIT project manager	High-Tech	Private	Decentralized	Digitaleo, Salesforce	110,000

Appendix B:. Interview guide – Stage 1

1. Can you please start by introducing your company?
2. As mentioned in the emails, has your organization been using cloud services for more than 3 years?
3. Do you have previous experience with cloud adoption in other organizations? If so, could you please elaborate?
4. In your current organization, which deployment models are you adopting?
   a. Public? Private? Hybrid?
5. In your current organization, which service models are you adopting?
   a. SaaS? PaaS? IaaS?
6. Can you share your professional experience with cloud adoption, specifically with SaaS adoption?
7. What are your expectations from adopting SaaS services i.e., what are the benefits behind it?
8. Do risks emerge from the adoption of SaaS services?
   a. What types of risks? How do you mitigate them?
9. What is the strategy behind adopting SaaS applications in your organization?
   a. Innovation? Reduction of costs? Competition? Agility? Other?
10. Have you witnessed an impact of SaaS adoption on organizational agility? If yes, how so?
11. How open are employees to change and how ready are they to adapt to SaaS applications?
12. To what extent does SaaS adoption push employees from different departments to collaborate and support each other to success?

Appendix C:. Coding schemes for stages 1 and 2

Code Scheme - Stage 1	Code Scheme - Stage 2
Characteristics	**Characteristics**
• Pay-per-use • On-demand self-service • Broad network access • Resource pooling • Rapid elasticity	• Pay-per-use • On-demand self-service • Broad network access
Barriers to SaaS adoption	**Mechanisms**
	• Basic affordance - Implementing quickly - Sourcing independently • Higher-level affordance

(*continued on next page*)

(*continued*)

Code Scheme - Stage 1	Code Scheme - Stage 2
• Data loss	- Trialing alternatives
• Security and confidentiality	- Self-organizing business teams
• Reliability	• Immediate concrete outcomes
• Resistance to change	- Short setup times
• Switching costs	- Low maintenance costs
Motivations to SaaS adoption	- Less IT unit dependency
	- Business solutions quickly found
	- Business change quickly implemented
• Agility	- IT units' power loss
• Price	**Outcomes**
• Ease of access	
• Performance	
• Usage flexibility	• Organizational agility
Organizational environmental characteristics	- Sensing to decision-making
	- Decision-making to acting
	• Organizational inertia
• Mimetic tendency	- Socio-cognitive
• IT decision-making	■ Fragmentation
	■ Routinization
	- Negative psychology
	■ Reskilling pressure
	■ Job insecurity
	- Socio-technical
	■ Data security
	- Economic
	■ Switching costs
	- Political
	■ Reclaiming decision-making
	■ Power
	Organizational environmental characteristics
	• Mimetic tendency
	• Decentralized IT decision-making

Appendix D:. Interview guide – Stage 2

1. What are the different cloud decisions that the organization has addressed during regular meetings?
2. How do you perceive your organization's IT is mostly governed?
   a. Through a centralization? Decentralization?
3. Who takes cloud-related decisions? Is it through discussions and collaboration?
4. How is the role of the IT department affected by the SaaS adoption?
   a. Do you witness any resistance? If so, what kind of resistance?
   b. And by whom?
   c. Can you explain/justify this resistance?
5. Is it easy for your team/colleagues to implement SaaS applications?
6. Do you think SaaS applications are just a buzzword?
   a. Do you think the only reason business departments in your organization are leaning towards SaaS adoption is because of it being a buzzword?
7. Does SaaS adoption have a general positive assessment in your organization?
8. How have SaaS applications in your organization enhanced agility? Specifically, agility in the following tasks: *

a. Sensing tasks? (e.g., scanning business events that manifest in the environment and that might change organizational strategy, competitiveness, and future performance)
b. Decision-making task? (e.g., gathering, aggregating, structuring, and evaluating relevant information from diverse internal and external sources)
c. Acting task? (e.g., introducing new products/services and new pricing models to the market and changing policies with strategic partners and major customers.

9. How has this been different from the time before this SaaS solution was implemented?

* Probes emphasized in follow-up interviews.

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