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Abstract

Understanding the antecedents and consequences of a firm's agility in cloud software applications is important. This papers draws on the competitive dynamics perspective to develop a model that explains the relationships between collaboration with vendors, agility, and competitive performance in software-as-a-service (SaaS) context. Collaboration reflects a firm's ability to leverage interfirm resources, characterized as knowledge sharing and process alignment. Agility is measured by a firm's strategy-oriented agility and service-oriented agility. This study also investigates the moderating effect of environmental turbulence. The proposed hypotheses are supported by the empirical data. The results show that competitive performance is affected by ability, which, in turn, is impacted by collaboration. Environmental turbulence positively moderates the relationship between agility and performance. Finally, we discuss the implications of our results.

Keywords: dynamic capability, performance, software-as-a-service, collaboration.

1   INTRODUCTION

SaaS, referring to on-demand software applications delivered as a service over Internet, is becoming an important model that provides client firms with Internet-based access to resources and expertise (Benlian & Hess, 2011; Benlian et al., 2012). SaaS has caught researchers' and practitioners' attention because of SaaS's economic and strategic benefits yielded from cloud computing (Armbrust et al., 2010; Susarla et al., 2009). Despite the growing trend and the purported benefits of SaaS, high failure rates of SaaS have been reported (Petty, 2006; Benlian et al., 2009, 2012; Goo et al., 2009). Research notes that one good reason for these failures is underutilization of SaaS as a source of increasing organizational agility (Dove, 2001; Teece et al., 1997). Organizational agility refers to a firm's ability to deal quickly with unexpected situations and rapid changes, and thrive in a competitive environment of new opportunities (Lu & Ramamurthy, 2011). A Firm cannot optimize its SaaS investment unless it is utilized as a means of sensing and responding to customer-based opportunities for service provision and innovation (Bardhan et al., 2010; Han et al., 2013). Thus, because SaaS creates great opportunities for firms' competitive advantage, there is strong incentive to deepen understanding on how and why a client firm uses SaaS to increase its competitive action.

Prior work on SaaS and organizational agility has suggested that a strategic management perspective should be employed combining organizational, information technology (IT), and relationship management factors (Quinn, 1999; Susarla et al., 2010). Accordingly, some studies (Lu & Ramamurthy, 2011; Roberts & Grover, 2012) have considered various antecedents to IT-enabled agility, including relational value creation (e.g., process alignment, knowledge sharing)(Rai et al., 2012; Saraf et al., 2007), service orientation (e.g., flexibility of accessing SaaS vendors' resources and services, service improvement) (Benlian & Hess, 2011; Han et al., 2013), and contextual factors (e.g., task environment, relational norms)(Goo et al., 2007; Mani et al., 2010; Rai & Tang 2010).However, less attention has been paid to the IT-agility contradiction perspective—IT may enable or hinder agility.

Prior literature widely agrees that IT enables agility by sensing opportunities for innovation or competitive action, and responding to changing conditions through coordination and improvement of a firm's processes (Sambamurthy et al., 2003; Weill et al., 2002). In contrast, others have pointed out that IT may impede organizational agility because of rigid IT architecture or the limitations of inflexible legacy IT applications (van Oosterhout et al., 2006). SaaS multi-tenant architecture allows its clients to share IT applications and infrastructure, and have a cheaper access to applications and resources than the application service provision (ASP) model (Armbrust et al., 2010). SaaS enables its client to have low vendor lock-in cost and high agility, including flexibility in switching SaaS vendors to respond to firm-level volatility and leveraging vendors' expertise and capabilities in enhancement of business processes and strategies (Benlian & Hess, 2011; Bharadwaj, 2000). However, SaaS skeptics argue that SaaS provides its clients with limited customized services and potential traffic bottleneck due to sharing IT infrastructure and applications (Benlian et al., 2009; 2012). This in turn

may hinder SaaS clients' agility. Despite these inconsistent findings that SaaS can increase as well as decrease organizational agility and performance, there is a lack of understanding on contradictions between SaaS and agility.

The aim of this study is to advance theory on SaaS capability sourcing by answering two research questions: How do relationship-specific capabilities affect a SaaS client's agility? and how does this agility interact with the contextual factor (environmental turbulence) to influence the SaaS client's competitive activity ? Building on the competitive dynamics theory (Kirzner 1973; Chen, 1996), the underlying premise of this study is that the extent to which a SaaS client can get competitive advantage relies on its ability to increase agility through leveraging intefirm resources and capabilities. The competitive dynamics theory provides a useful lens to explain how a firm's competitive action is enhanced by a firm's internal and external resources and capabilities (e.g., intefirm resources from a SaaS vendor). Drawing from the relational view (Dyer & Singh, 1998), we focus on two interfirm capabilities that directly relate to a firm's agility—knowledge sharing and process alignment. We draw on the competitive dynamics perspective to conceptualize agility as strategic agility and service-oriented agility, and competitive action as competitive performance.

We surveyed 215 firms and analyzed the data using partial least squares (PLS). The empirical findings largely support the proposed hypotheses. Our results help extend current theory by providing managerial insights on the necessary capability either from the interfirm resources or the firm's agility to enhance its competitive outcome.

2   RESEARCH MODEL AND HYPOTHESES

Agility and competitive performance

The research model is shown in Figure 1. Table 1 lists the definitions of the constructs. Competitive activity incorporates market-based moves that question the status quo of the market or customer-based service through strategic initiative or innovation in services/products (Chen, 1996; Roberts & Grover, 2012). The outcome of competitive activity is measured as competitive performance, which reflects a firm's ability to achieve its objectives and competitiveness, including increasing market sharing and profitability, and innovation in service development and marketing actions (Rai & Tang, 2010).

Construct	Definition	Reference
Competitive performance	The extent to which a SaaS client executes actions that produce the desired results, including innovation, market share, capturing market opportunities.	Benlian et al. 2012; Roberts and Grover 2012
Strategy-oriented agility	A SaaS client's ability to have change-bracing and innovation-oriented	Sambamurthy et al. 2003; Teece et al. 1997

	mindset, and to rapidly develop strategic plan and vision.	
Service-oriented agility	A SaaS client's ability to provide service quality improvement through operational adjustment and rapid implementation.	Broadbent et al. 1999; Dove 2001; Overby et al. 2006
Environmental turbulence	General conditions of uncertainty associated with competitive intensity and demand fluctuation. (Mendelson 2000; Rai & Tang 2010)	Mendelson 2000; Rai & Tang 2010
Knowledge sharing	The extent to which a SaaS supplier shares insights and knowledge about its business context with its client.	Saraf et al. 2007
Process alignment	The extent to which a SaaS supplier is able to coordinate interdependent activities with the client.	Rai & Tang 2010, Saraf et al. 2007

Table 1.   Definitions of the constructs
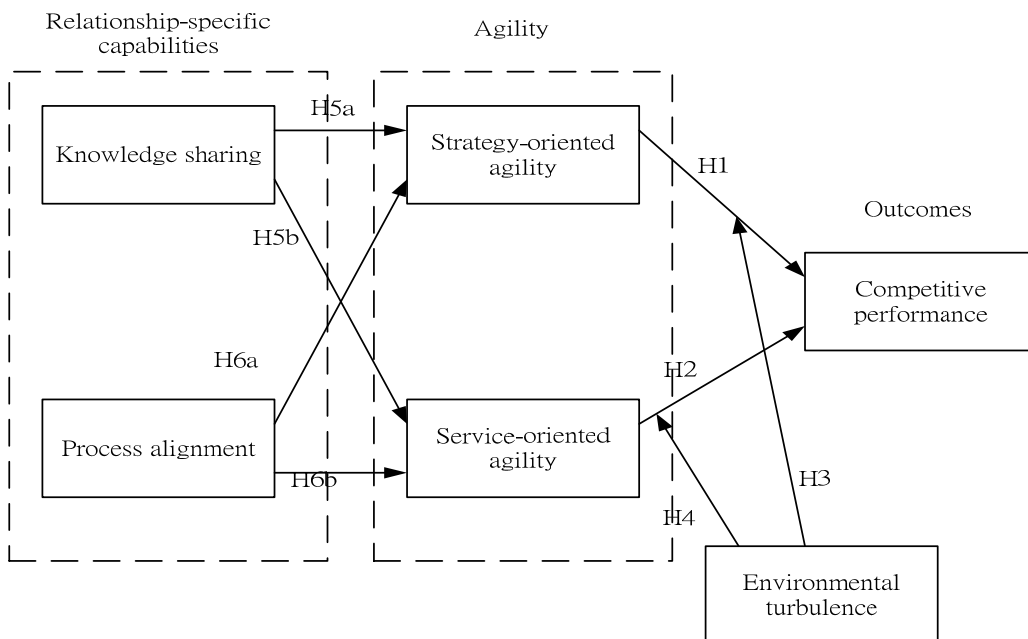
Figure 1.   Research model

According to the competitive dynamics perspective, the extent to which a firm enhances competitive performance relies on the degree of dynamic capability development (Ferrier, 2001; Teece et al., 1997). Dynamic capabilities reflect a firm's ability to sense and respond to opportunities through strategic vision and customer-based innovation and service enhancement (Dove, 2001; Eisenhardt & Martin, 2000). Besides, improving dynamic capabilities and maintaining

competitiveness also require a firm to reconfigure and align its tangible and intangible resources. For example, Rai and Tang's (2010) study on B2B relationship management found thata firm's competitive performance was influenced by its alignment and flexibility in process management capabilities (e.g., coordination of interfirm operations with its partners, process flexibility in service provision and partner collaboration) and in IT capability management (e.g., integration, reconfiguration, and combination of IT-related resources such as data, collaboration applications).

Strategy-oriented agility focuses a firm's ability in continual learning, new configurations of resources in response to changes, and flexibility to plan strategy that anticipates and incorporates future and current needs (e.g., exploring ways to reengineering processes to better serve markets and sense IT innovation) (Agarwal & Sambamurthy, 2002).Thus, strategy-oriented agility's alignment and flexibility help a SaaS client avoid competency trap and enable the client to reconfigure its internal and external (e.g., the SaaS vendor) resources that identify market opportunities and swiftly capitalize on these opportunities. Hence, we anticipate that strategy-oriented agility helps a firm overcome contradiction from SaaS capability sourcing and enhances its dynamic capability, which leads to better competitive performance. We therefore propose H1.

Service-oriented agility emphasizes speedy execution of strategy and ensures that IT initiatives, and customer-based services and opportunities are targeted in line with business strategy (El Sawy et al., 1999). Besides, these services and opportunities are implemented through alignment between IT and business managers, and effective joint decision between them. Service-oriented agility seeks to increase flexibility through informal and improvised decision making, and experiential learning to reengineer business processes and quickly adjust internal processes (Rai & Tang, 2010; Saraf et al., 2007).Due to the service-oriented agility's capability in alignment, flexibility, continuous learning and internal resource management, such agility can significantly reduce SaaS application rigidity, avoid SaaS contradiction, and improve a firm's dynamic capability, which positively affect competitive performance. Thus, we present H2.

H1: SaaS client's strategy-oriented agility positively affects competitive performance.

H2: SaaS client's service-oriented agility positively affects competitive performance.

SaaS model enables a client to have flexibility in switching vendors (strategic flexibility), refocus on its core business (e.g., valuable service provision for customers), and access to vendors' latest technologies and know-how, which all rely on the client's environment (Benlian & Hess, 2011). This is because volatility and uncertainty in environment renders agility more critical for competitive outcomes. For example, compared to environments with less turbulence, a client requires more agility (e.g., flexibility, alignment, resource management) in a competitive environment with volatility and unpredictable changes to exploit them as opportunities for growth (Overby et al., 2006; Zhang & Sharifi, 2000).

This study focuses on environmental turbulence because it captures the unique features of SaaS model in which the impact of agility on competitive outcomes relies on a client's management of capability sourcing, including agility in leveraging a SaaS vendor's capability for service provision,

and strategic vision and initiatives. Environmental turbulence refers to general conditions of rapid changes and emerges from three key resources—(1) market turbulence: rate of changes in the composition of customers and their preference, (2) competitive intensity: the number of competitors in the field, and (3) technological change: the frequency of IT breakthrough (Jap, 2001; Mendelson, 2000; Rai & Tang, 2010). Drawing from this literature, we theorize environmental turbulence as a client's perception on uncertainty and changes associated with demand fluctuation, competitive intensity, and the frequency of technological breakthrough.

Our fundamental hypothesis is that environment turbulence serves as a context for a firm's competitive activity that strengthens the influence of the firm's agility on competitive performance. Environmental turbulence is a key determinant of a firm's competitive outcomes, strategic vision and moves, capabilities, and service provision (Rowley et al., 2000). The competitive dynamics perspective suggests that a firm's dynamic capabilities become more important to competitive performance when environmental turbulence increases because the firm requires more ability to sense and respond to opportunities (Chen, 1996; Hitt et al., 1998). Studies on competitive dynamics found that contextual variables (e.g., environment, IT features, IT management) played a key role in properly explaining contradiction (e.g., agility-performance, IT-agility) (Ru & Ramamurthy, 2011; Tallon & Pinsonneault, 2011). For example, environmental volatility positively moderates the relationship between agility and performance (Tallon & Pinsonneault, 2011). These studies' main argument is that a firm obtains competitive advantage from its agility in service provision and strategic thinking through dealing with changes and environmental turbulence, and overcoming agility-performance contradiction. Following this logic, we argue that when environment turbulence increases, a firm needs more agility to increase its competitive performance. Thus, we formulate H3 and H4.

H3: Environmental turbulence positively moderates the relationship between a SaaS client's strategy-oriented agility and competitive performance.

H4: Environmental turbulence positively moderates the relationship between a SaaS client's service-oriented agility and competitive performance.

Knowledge plays a key role in building a firm's dynamic capabilities, because knowledge sharing or sourcing from partners increases a firms' ability in sense and response to external challenges and threats, continual learning, innovations, and resource reconfigurations (Ferrier, 2001; Roberts & Grover, 2012; Saraf et al., 2007). For example, a firm's ability to acquire knowledge, engage in proactive information seeking, and augmented learning helps it better sense IT innovation, consider its fit to the firm, and avoid falling into lock-in IT (or capability) rigidity (Ru & Ramamurthy, 2011). This in turn enables the firm to increase agility and solve IT-agility contradiction. The relational view (Dyer and Singh, 1998) treats knowledge sharing as invaluable resources embedded in partner relationships to help firms develop, sustain, and renew their capability to cope with changes. Prior B2B studies generally agree that interfirm knowledge sharing represents a valuable external resource that affects a firm's agility(Roberts & Grover, 2012; Saraf et al., 2007).

The extent to which a client firm can effectively achieve capability sourcing from SaaS vendors depends on knowledge sharing between them (Benlian & Hess, 2011). SaaS studies note that vendors' skills, resources, capabilities, knowledge (e.g., latest technologies, IT-related know-how and innovations, IT-enabled service, market opportunities and threats) and knowledge sharing facilitate interfirm learning, joint problem solving, and aligned working styles (Benliean et al., 2012; Susarla et al., 2009; 2010). Because knowledge sharing plays a key role in leveraging external resources and new use or configurations of resources, knowledge sharing and exchange with SaaS vendors not only increases a SaaS client's agility but also avoids capability-agility contradiction. Thus, we posit that knowledge sharing with a SaaS vendor positively affects a client's agility, leading to H5a and H5b.

H5a: Knowledge sharing positively affects a SaaS client's strategy-oriented agility.

H5b: Knowledge sharing positively affects a SaaS client's service-oriented agility.

Process alignment refers to the extent to which the SaaS vendor has the ability to coordinate interfirm processes and align its service provision with the client's goals. B2B research has highlighted the importance of fostering interfirm relationships to improve process alignment, from which firms access external resources that offer complementary capabilities (Subramani, 2004).

SaaS models emphasize the need to manage interfirm processes (Benlian et al., 2012). Studies point out that interfirm coordination and flexibility to adapt to uncertain situations and cope with rapid changes enable a SaaS client to handle unforeseen contingencies, and enhance its ability to sense and respond to opportunities for service provision, innovation, and strategic moves (Bardhan et al., 2010; Benlian et al., 2009; Han et al., 2013; Susarla et al., 2010). For example, SaaS capability sourcing aims to improve service quality, in terms of aligned working styles, flexibility in changing functional aspects (e.g., interoperability), and adjustment in key functionalities and design features of SaaS applications to meet a client's requirements (Benlian & Hess, 2011; Benlian et al., 2012). When a SaaS vendor's services are aligned with its client's goals, capability sourcing from the vendor helps its client increase awareness and capability to exploit opportunities for innovation, new service provision, and competitive action (Benlian et al., 2012; Roberts & Grover, 2012; Susarla et al., 2009, 2010). Thus, process alignment plays a key role in increasing agility and solving capability-agility contradiction. Thus, we propose H6a and H6b.

H6a: Process alignment positively affects a SaaS client's strategy-oriented agility.

H6b: Process alignment positively affects a SaaS client's service-oriented agility.

3   METHOD

This study aims to explain the relationship between competitive outcome, a SaaS client's agility, and its collaboration with its vendor. We draw on the relational view, the competitive dynamics perspective, and literature on agility to develop a theoretical model. Our model includes four independent variables and one moderator. This study used a firm level of analysis (from a SaaS client perspective) to investigate how to improve a client's competitive performance through its own agility and leveraging its SaaS vendor's capability. Besides, we also examined the moderating effect of

environmental turbulence on the relationship between agility and competitive performance. A survey method was conducted to test the proposed hypotheses. We developed the questionnaire by choosing the constructs that have been used and validated by prior work.

3.1   Sample and data collection

We identified 700 firms with SaaS experience through the assistance of Market Intelligence & Consulting Department under the institute for Information Industry in Taiwan. Similar to prior firm-level empirical studies (Lu & Ramamurthy, 2011; Rai & Tang, 2010), senior IT managers were chosen as the key informants because of their knowledge about outsourcing and competitive action. Of the 600 distributed surveys, 264 responses were received and 49 responses were discarded due to missing data. Therefore, 215 responses were retained (26% response rate) in the final analysis. More than 50% of the respondents have 2 years or more experience in SaaS, and nearly half of them are from small and medium-sized firms with fewer than 500 employees and annual revenues less than NT$3 billion. To check the nonresponse bias in terms of firm size, we compared the responding and nonresponding firms in terms of annual revenues and the number of employees. Based on independent sample t-tests, we found no significant differences between these two groups ($p > 0.05$). Next, we divided the respondents into two groups according to their dates of questionnaire returns. The t-test result of these two groups was not statistically significant. Hence, we conclude that non-response bias was not an issue (Johnson & Wichern, 2002).

3.2   Measurements

All the survey items were measured using a seven-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree). As shown in Table 1, dependent variable is competitive performance, which was adapted from Rai and Tang (2010), and Roberts and Grove (2012). Two variables were used to reflect a firm's agility—strategy-oriented agility, service-oriented agility, which was developed by revising the instruments of agility (Lu & Ramamurthy, 2011; Roberts & Grover, 2012). The measures of relationship-specific capabilities were based on the relational view, including knowledge sharing and process alignment (Dyer & Singh, 1998; Saraf et al., 2007). Finally, environment turbulence was adapted from Rai and Tang (2010), reflecting a moderator of the relationship between agility and competitive performance. All constructs are viewed as reflective based on the criteria identified by Jarvis et al. (2003).To examine the common method biases (CMV) that may occur in questionnaire-based studies, we used the technique of counterbalancing question order and psychological separation of measurement (Podsakoff et al., 2003), and Harmon's one-factor test. Based on the results, we conclude that CMV is not a concern in our data.

3.3   Analysis and results

Measurement model

Convergent validity, referring to the extent to which multiple questions measuring the same construct agree, was measured by reliability, composite reliability, and average variance extracted (AVE) of constructs. Construct reliability was examined based on Cronbach's alpha. Discriminant validity is assured when (1) cross-loadings show all items have a higher loading in the defined construct than in any other construct, (2) the correlation between pairs of constructs is less than 0.9, and (3) the square root of AVE is larger than the correlation between constructs. Table 2 shows that Cronbach's alphas were greater than 0.7 and AVEs were greater than 0.6, indicating high internal consistency. Table 2 (reliability, AVE) and 3 (descriptive statistics, correlation matrix) suggest that the constructs in our model had adequate discriminant and convergent validity. Finally, we checked multicollinearity through variance inflation factor (VIF) values in our structural model. The results of VIF tests were less than 3, thus alleviating concerns about multicollinearity.

Structural model

H1 and H2 predicted the effect of agility on competitive performance. Both strategy-oriented agility (β=0.132, $p < 0.1$)and service-oriented agility (β=0.132, $p < 0.1$) had a significant influence on competitive performance, explaining 20% of the variance of competitive performance (see model 1 in Table 4). These findings supported both H1 and H2.

We evaluated the moderating effect by comparing the difference between the main effect and the moderating effect models (Chin et al., 2003). The R-square(R_1^2) of the main effect was obtained, including the independent variable, moderator, and dependent variable only. Next, we calculated R-square (R_2^2) of the moderating effect model, including all the variables in the main model and the interaction terms in the model. The interaction terms were obtained by adding the product of each indicator in the independent variable and the moderator. Then, we measured an estimated effect size of f^2 from (R_2^2 - R_1^2)/ (1 - R_2^2) and a pseudo F-value by multiplying f^2 with (n-k-1), where n is the sample size and k is the number of independent variables in the regression model. According to Chin et al. (2003), 0.03, 0.15, and 0.35 of f^2 imply small, medium, and large interaction effects respectively. Finally, we compared the difference between F-value and $F_{1, n-k-1}$. The goal of these procedures is to test the change of variance extracted by adding a new variable (the interaction term) into the model. The results in Table 4 supported both H3 (model 2) and H4 (model 3).

H5a and H5b predicted the effect of knowledge sharing on agility. The results from model 1 in Table 4 showed that knowledge sharing had a significant impact on service-oriented agility (β=0.389, $p < 0.01$), but the influence on strategy-oriented agility is not significant(β= 0.078, p=n.s.).Hence, H5b was supported, but H5a was not. H6a and H6b assessed the effect of process alignment on agility. The findings from Table 4 (model 1) reported that process alignment had significant effect on both strategy-oriented agility (β=0.513, $p < 0.01$) and service-oriented agility (β=0.334, $p < 0.01$).Knowledge sharing and process alignment explained 29% of the variance on strategy-oriented agility and 34% of the variance on service-oriented agility. Thus, H6a and H6b were confirmed.

Constructs	# of items	Composite	Average Variance	Cronbach

		Reliability	Extracted	Alpha
Knowledge Sharing	3	0.863	0.679	0.768
Process Alignment	5	0.828	0.548	0.725
Strategy-oriented agility	5	0.915	0.682	0.883
Service-oriented agility	6	0.864	0.515	0.812
Competitive performance	5	0.845	0.522	0.770
Environmental Turbulence	3	0.815	0.595	0.759

Table 2.   Reliability and average variance extracted

	Mean	**S.D.**	**KS**	**PA**	**STR**	**SER**	**CP**	**ET**
KS	4.767	0.973	**0.824**					
PA	4.737	0.874	0.294	**0.740**				
STR	4.658	1.002	0.229	0.536	**0.826**			
SER	4.871	0.960	0.487	0.449	0.427	**0.718**		
CP	5.018	0.888	0.303	0.354	0.291	0.428	**0.722**	
ET	4.851	0.961	0.294	0.257	0.236	0.378	0.435	**0.771**

Table 3.   Correlation between construct (The shaded numbers in the diagonal row are square roots of the average variance extracted (AVE))

Model	1(all)	2	3
Dependent variable: Competitive performance			
Strategy-oriented agility (H1)	0.132*		
Service-oriented agility (H2)	0.376***		
Strategy-oriented agility * environmental turbulence (H3)		0.136*	
Service-oriented agility * environmental turbulence (H4)			0.223**
R^2	0.201	0.214	0.249
Differenced R^2		0.013	0.048
f^2		0.017	0.064
Test of differenced R^2		3.587*	13.504***
Dependent variable: Strategy-oriented agility			
Knowledge sharing (H5a)	0.078		
Process alignment (H6a)	0.513***		
R^2	0.293		
Dependent variable: Service-oriented agility			
Knowledge sharing (H5b)	0.389***		
Process alignment (H6b)	0.334***		

R^2	0.339		

Table 4.   Structural model results

  (F(0.1, 1, 211)=2.729   ; F(0.05, 1, 211)=3.886   ; F(0.01,1,211)=6.757; *p<0.1 ; **p<0.05 ; ***p<0.01)

4   DISCUSSION

Seven of eight hypotheses are supported, which provides compelling evidence to support our theoretical arguments. First, our results generally confirm that interfirm capabilities do affect the extent to which a client uses it as a capability source to increase agility in strategic vision and service provision based on customer-based opportunities. The proposed interfirm capabilities—agility-outcomes framework generally confirms that a SaaS client's agility to leverage external resources, reconfigure its internal resources for strategic move and service provision, and mitigate the effect of environmental turbulence plays a critical role in competitive performance.

Second, research has been somewhat inconsistent (contradictory) on how much agility is influenced by capabilities (e.g., IT-enabled capability, capability sourcing) (Lu & Ramamurthy, 2011) and how agility can improve performance (Tallon & Pinsonneault, 2011).In Table 4, our findings for H5b, H6a, H6b suggest that a SaaS client's agility is influenced by the interfirm value creation through knowledge sharing and process alignment. These findings support the arguments that the extent to which capability sourcing avoids capability-agility contradiction depends on SaaS partners' (client, vendor)capabilities in managing the conflicting goals of stability (e.g., process alignment) and flexibility (e.g., knowledge sharing to facilitate learning and resource reconfigurations)(Lu & Ramamurthy, 2011; van Oosterhout et al., 2006; Volberda & Rutges, 1999).The only unsupported hypothesis (H5a) is the impact of knowledge sharing on strategic-oriented agility—positive but insignificant. The possible reason is that knowledge sharing represents a necessary but insufficient mechanism to increase a SaaS client's agility in strategic vision and move. Future work may focus on more sophisticated capability sourcing mechanisms to achieve interfirm resource management and usage.

Finally, from Table 4 (model 2, 3), the results regarding the moderating role of environmental turbulence show that it strengthens the degree to which agility affects competitive performance. Prior work on strategy management has recognized that the link between agility and competitive action is contingent on the rate of change and uncertainty in the environment (Rai & Tang, 2010; Tallon &Pinsonneault, 2011).This indicates that a firm's ability to ensure flexibility and alignment, conceptualized as a firm's agility in strategic initiatives and service provision, becomes more important to enhance performance in turbulent environment. Understanding the moderating role of environmental turbulence also helps explain agility-performance contradiction.

Overall, our results have presented clear evidence on significance of the competitive dynamic perspective that explains the process of SaaS-enabled performance. Prior work has provided a limited understanding on how a SaaS client's agility is affected by collaboration with its vendor and how this

agility influence the client's competitive performance in turbulent environment. This study gives new insights by proposing an interfirm capability-agility-outcomes framework that explains how SaaS-based capability sourcing, in terms of knowledge sharing and process alignment, affects a SaaS client's agility, which in turn influences its performance. Our findings advance knowledge on the extent to whicha SaaS client can manage its internal and external resources, increase agility in strategic and service quality aspects, and avoid contradiction.

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