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Research Article

The Role of IS Capabilities in the Development of Multi-Sided Platforms: The Digital Ecosystem Strategy of Alibaba.com

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Abstract

Multi-sided platforms (MSP) are revolutionizing the global competitive landscape in the new networked economy. Yet, although these MSPs are underpinned by information systems (IS), there is currently little research on how the IS capabilities of the platform sponsor can influence, and co-evolve with, the development of the platform over time. The lack of knowledge in this area may account for the difficulties faced by a significant number of platform sponsors in developing their MSPs effectively. Using a case study of Alibaba.com, one of the world's largest and most commercially successful online MSP, we inductively derive a process theory of MSP development from an IS capability perspective to address this knowledge gap. The process model reveals that the role of IS capabilities in MSP development is evolutionary in nature, and the antecedent IS capabilities, nature, and outcomes of MSP development can be dramatically different in the various stages of development.

Keywords: *Multi-Sided Platforms, IS Capabilities, Network Competition, Platform Development, Case Study.*

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1. Introduction

As the contemporary business landscape becomes increasingly defined by inter-network, as opposed to inter-firm, competition (Adner & Kapoor, 2010), today's most influential businesses tend to be those that bring and bind together distinct groups of entities in a business network (Eisenmann, Parker, & van Alstyne, 2006; Pierce, 2009). Commonly referred to as the sponsors of multi-sided platforms (MSPs) (e.g., Boudreau & Hagiu, 2009), these businesses provide the infrastructure, services, and rules that enable transactions between network members (Bakos & Katsamakas, 2008; Iansiti & Levien, 2004b). A MSP is a commercial network of suppliers, producers, intermediaries, customers (Cusumano & Gawer, 2002), and producers of complementary products and services termed "complementors" (Teece, 2007, p. 1324) that are held together through formal contracting and/or mutual dependency (Pierce, 2009). Notable examples of MSP sponsors include Microsoft, which brings together PC manufacturers, users, and application developers with its Windows operating system; Google, which brings together Internet users, content providers, and advertisers with its web portal; and eBay, which brings together buyers and sellers with its online auction marketplace (e.g., Eisenmann et al., 2006; Gawer & Cusumano, 2008; Pavlou & Gefen, 2004).

Despite their growing importance and relevance in the new networked economy, our knowledge on MSP formation and development remains limited. In particular, the existing literature has two important gaps. First, the majority of the existing studies are centered on MSPs' pricing structure (e.g., Bakos & Katsamakas, 2008; Rochet & Tirole, 2006), while research on other factors that could influence MSP development, such as the platform sponsor's role (Dhanaraj & Parkhe, 2006) and an appropriate platform development strategy (Gawer & Cusumano, 2008), remain limited. Second, MSPs' current viability can be largely attributed to important advances in information systems (IS) since the turn of the millennium (e.g., Yoo, Choudhary, & Mukhopadhay, 2007), which has "increased the opportunities for building larger, more valuable and powerful platforms" (Hagiu, 2009, p. 2). Yet, the role of IS capabilities in MSPs' formation and development and the evolution of those capabilities over time have not been studied to a significant degree. We elaborate on these gaps in our literature review, but, beyond their academic significance, these knowledge gaps may account for the difficulties encountered by the significant majority of platform sponsors in establishing and sustaining their MSPs (Eisenmann et al., 2006).

Using a case study of Alibaba.com, one of the world's largest online MSPs that supports a thriving network of over 80 million members worldwide, we examine how Aliaba's phenomenally successful platform was developed. In creating a "consultable record" (Geertz, 1973, p. 30) of how Alibaba's IS capabilities had influenced, and co-evolved with, the development of its MSP over time, we address the aforementioned gaps in two ways. First, we present a process theory on MSP development from an IS capability perspective to complement existing research. Second, we provide a longitudinal perspective of MSP development that captures the dynamicism of the phenomenon, and we reveal the sequence and boundary conditions of some of the enablers for platform development identified in the literature (e.g., Eisenmann, Parker, & van Alstyne, 2009; Gawer & Cusumano, 2008). Accordingly, we explore two research questions: 1) how did Alibaba's IS capabilities influence its MSP's formation and growth?, and 2) how did Alibaba's IS capabilities evolve with the development of its MSP over time?

2. Literature Review

2.1. Multi-Sided Platforms

Although platforms have existed for centuries (Hagiu, 2009, for instance, cites the village market and matchmakers as historical examples of platforms), they are gaining prominence in the contemporary business landscape to the extent that many diverse industries are led by the businesses that operate them today (Eisenmann et al., 2006; Evans & Schmalensee, 2007). Reflecting their increasing economic importance (Adner & Kapoor, 2010), a growing number of studies centered on the development of platforms are emerging (Parker & van Alstyne, 2008). As a theoretical concept, the

notion of platforms were initially introduced as "two-sided markets", which refers to a market with two distinct sides that benefit from network effects by interacting on a common platform (see Rochet & Tirole, 2003). Network effects refers to the increasing value of platform membership to an entity as the number of other entities on the platform increases (Katz & Shapiro, 1994).

MSPs are related to, and build on (e.g., Bakos & Katsamakas, 2008), the concept of two-sided markets. Like two-sided markets, cross-side network effects must exist between the different groups of entities on a MSP (Bakos & Katsamakas, 2008) that the entities cannot establish independently (Rochet & Tirole, 2006). Moreover, both MSPs and two-sided markets are managed by a sponsor that is responsible for providing the infrastructure and services to enable interactions and triangular exchanges between the different groups of entities (Eisenmann et al., 2009) and for establishing the rules that govern transactions and coordinate network activities (Boudreau & Hagiu, 2009). A key point of difference, however, is that, unlike two-sided markets, MSPs are more complex in that they serve a variety of distinct entities with diverse interests. These entities could include the suppliers, producers, intermediaries, customers, and complementors in a business network (Adner & Kapoor, 2010; Cusumano & Gawer, 2002) that "need each other in some way" (Evans & Schmalensee, 2007, p. 152). Note that the terms "ecosystem" and "market" are sometimes used synonymously with "platform" (e.g., Eisenmann et al., 2006; Parker & van Alstyne, 2008) in the literature. Likewise, the platform sponsor is sometimes referred to as a platform leader (e.g., Gawer & Cusumano, 2008), a keystone (e.g., Iansiti & Levien, 2004a), or a core firm (e.g., Pierce, 2009).

A review of published and working papers (refer to Table 1) reveals two gaps of the existing literature on MSP development. First, a significant number of the existing studies focus on platforms' pricing structure and assume that a network will develop effectively through the workings of network effects once the right pricing structure is in place (e.g., Bakos & Katsamakas, 2008; Rochet & Tirole, 2006). To illustrate, the factors that influence platform development identified in these studies include institution-based trust (Pavlou & Gefen, 2004), size of cross-network effects (Armstrong, 2006), membership costs (Rochet & Tirole, 2006), subsidies (Evans & Schmalensee, 2007), and network asymmetries (Bakos & Katsamakas, 2008; Yoo et al., 2007).

Table 1. Selected Studies on MSP Development

Source	Type	Key arguments
Cusumano & Gawer (2002)*	Conceptual	To attain platform leadership, a firm must determine its scope, decide on level of product modularity, determine the nature of their relationship with platform entities, and establish the right internal structure.
Rochet & Tirole (2003)	Empirical	Most markets with network effects are platforms. Markets are only platforms if they can effectively cross-subsidize between the different groups of platform members.
Iansiti & Levien (2004b)*	Conceptual	Platform success is dependent on the role of the platform sponsor. Platform sponsor should adopt the role of a keystone and provide benefits to the other platform members to improve its own chances of survival
Pavlou & Gefen (2004)*	Empirical	Platform success is dependent on trust in and perceived risk of sellers. These factors, in turn, are determined by the perceived effectiveness of four institutional mechanisms (feedback mechanisms, escrow services, credit card guarantees, and trust in intermediary).
Parker & van Alstyne (2005)	Empirical	Firms can give away products if it can cover the cost through complementary products. Deciding which side to subsidize in a two-sided platform depends on relative network effects.
Armstrong (2006)	Empirical	Determinants of equilibrium prices in two-sided platforms include size of cross-network effects, fee structure, and occurrences of multi-homing.
Dhanaraj & Parkhe (2006)*	Conceptual	Platform success is dependent on the effectiveness of the sponsor in managing knowledge mobility, innovation appropriability, and network stability in the platform.

Table 1. Selected Studies on MSP Development (cont.)

Source	Type	Key arguments
Economides & Katsamakas (2006a)	Empirical	Level of investment for developers in applications is larger when the operating system is open source rather than proprietary. The level of investment, in turn, is determined by reputation effects and the number of developers.
Economides & Katsamakas (2006b)	Empirical	The vertically integrated proprietary platform is the most profitable type of platform. However, the open-source platform can be more profitable than the vertically disintegrated proprietary platform under certain conditions (e.g., preference for application variety) and vice versa (e.g., when demand for proprietary platform is significantly larger than that of the application). Application variety is highest on open-source platforms.
Eisenmann et al. (2006)	Conceptual	To manage a two-sided platform effectively, the sponsor must adopt an appropriate pricing structure, manage the winner-take-all competitive dynamics, and mitigate the threat of envelopment
Rochet & Tirole (2006)	Empirical	Factors influencing the development of two-sided platforms include transaction costs for members, sponsor-imposed constraints, and membership costs.
Evans & Schmalensee (2007)	Conceptual	Pricing and strategies of platform sponsors are influenced by indirect and cross network effects. Profit-maximizing prices may involve subsidizing one set of customers over the long run.
Iansiti & Zhu (2007)	Empirical	Platform quality is not the sole determinant of platform success. Indirect network effects and forward looking behavior (i.e., consumer's discount factor of future applications) will enhance the effect of quality advantage. As such, installed-based advantages may not be sustainable.
Yoo et al. (2007)*	Empirical	Platform sponsor benefits from platform participation, which induces them to set prices that increases overall participation. Biased platforms confer greater benefits to participants than neutral platforms.
Bakos & Katsamakas (2008)	Empirical	Sponsors can influence the level and asymmetry of network effects. Participation should be encouraged for one side (through investments) and constrained for the other (through an appropriate pricing strategy).
Gawer & Cusumano (2008)	Conceptual	To become a platform leader, a firm should adopt a coring strategy to establish centrality and a tipping strategy to gain momentum and critical mass/
Parker & van Alstyne (2008)	Empirical	Increasing number of developers (i.e., suppliers) will increase platform openness. Increasing competition between developers will decrease platform openness. Platform openness can influence innovation and profits.
Eisenmann et al. (2009)	Conceptual	Strategies for managing platform openness include horizontal strategies, vertical strategies, and the absorption of complements. Each strategy affects the platform access of the four types of platform participants differently.
Hagiu (2009)	Conceptual	To design and develop a platform, the sponsor must identify a new platform opportunity, analyze risk of development, attract platform members, and select a business model before deepening their platform by providing enhanced value.
Eisenmann, Parker, & Van Alstyne (2011)	Conceptual	Platform development can occur through envelopment in three forms, the envelopment of complements, the envelopment of weak substitutes, and the envelopment of unrelated platforms.

* Although these papers do not explicitly use the term "platform", we have nevertheless included them in our literature review due to the proximity of the concepts used.

However, platform development is influenced by a host of other factors. But, of the handful of works that look beyond pricing, most are conceptual in nature and not supported with qualitative or quantitative evidence (e.g., Eisenmann et al., 2009; Gawer & Cusumano, 2008). The prescriptions for platform development presented in these works include the adoption of a facilitating role by the platform sponsor (Dhanaraj & Parkhe, 2006; Iansiti & Levien, 2004a), the management of competitive dynamics (Eisenmann et al., 2006), the identification of platform opportunities (Hagiu, 2009), the management of platform openness (Eisenmann et al., 2009), and the enactment of a "coring" and "tipping" strategy. Coring refers to the set of activities a sponsor can use to identify or design an offering (a technology, a product, or a service) and make this offering fundamental to the platform. Tipping, on the other hand, refers to the set of activities or strategic moves that sponsor can use to shape market dynamics and gain momentum when there are competing platforms (Gawer & Cusumano, 2008).

Second, although the contemporary MSPs that are revolutionizing the global competitive landscape are underpinned by IS (e.g., Hagiu, 2009; Yoo et al., 2007), little research on the implications of IS capabilities for developing these MSPs exists. The IS-related discourse in the existing MSP development literature has been largely limited to questions of compatibility versus incompatibility (e.g., Economides & Katsamakas, 2006b; Rochet & Tirole, 2006), open versus closed standards (e.g., Eisenmann et al., 2009; Parker & van Alstyne, 2008), and the migration strategies (e.g., Economides & Katsamakas, 2006a; Iansiti & Zhu, 2007) implied by these choices. While these issues are clearly important, given the criticality of IS to the form and function of these platforms (Eisenmann et al., 2006) and the far-reaching strategic and organizational implications of IS (e.g., Kohli & Grover, 2008; Sambamurthy, Bharadwaj, & Grover, 2003), we need more research in this area to provide MSPs' sponsors with clearer indications about how to develop and grow their platforms effectively.

To address these gaps, we examine the role of IS capabilities in MSP development and how this may evolve over time. Accordingly, we review the literature on IS capabilities to construct a theoretical lens that serves as "a complicated sensing device to register a complicated set of events" (Weick, 2007, p. 16).

2.2. IS Capabilities

IS capabilities refer to an organization's "ability to mobilize and deploy information technology (IT) based resources in combination or copresent with other resources and capabilities" (Bharadwaj, 2000, p. 171) to enhance its overall efficiency, effectiveness, and/or flexibility in accordance to business needs (Karimi, Somers, & Bhattacherjee, 2007). They are sometimes also referred to as IT capabilities (e.g., Santhanam & Hartono, 2003), IT assets (e.g., Nevo & Wade, 2010), IS resources (e.g., Karimi et al., 2007), or IS competencies (e.g., Tarafdar & Gordon, 2007) in the literature. Although some researchers have tried to draw a distinction between these terms (e.g., Doherty & Terry, 2007), all of them generally refer to the same theoretical construct and have typically been included in the same literature review of the topic (e.g., Tarafdar & Gordon, 2007; Wade & Hulland, 2004).

Motivated as a means for understanding the performance implications of IS (e.g., Bharadwaj, 2000), the earliest studies on IS capabilities emerged in the mid-1990s (e.g., Mata & Fuerst, 1995; Ross, Beath, & Goodhue, 1996) and have their roots in the resource-based view (RBV) of the firm (e.g., Barney, 1991). Almost fifteen years on, and invigorated by the re-emergence of the IT productivity paradox following the dot-com crash (e.g., Carr, 2003) along the way, contemporary research on IS capabilities remain just as well received and appear to have diverged into two dominant perspectives (Piccoli & Ives, 2005). One perspective draws on the classic proposition of the RBV and holds that certain IS capabilities may either be the means to sustainable competitive advantage in themselves (e.g., Bhatt & Grover, 2005; Santhanam & Hartono, 2003), or they may be strategic necessities (Powell & Dent-Micallef, 1997) that can be combined with complementary organizational capabilities to this end (e.g., Ravichandran & Lertwongsatien, 2005). On the other hand, reflecting the increasing skepticism about the possibility of sustaining competitive advantages over time (Sirmon, Hitt, & Ireland, 2007) and the growing consensus that IT has become a commodity in its pervasiveness and widespread availability (Carr, 2003), an alternative perspective of IS capabilities have instead emphasized their role in enabling enterprise agility. Enterprise agility refers to the organizational ability to consistently detect market opportunities and seize them with speed and surprise with the launch of "many and varied competitive actions" (Sambamurthy et al., 2003, p. 237). Unlike the first

perspective, the aim of enterprise agility is not to attain and sustain a single form of competitive advantage for an extended period; instead, in creating a continuous stream of temporary competitive advantages and stringing these together over time (Eisenhardt & Sull, 2001), a firm is able to maintain a constant edge over its competitors. A common theme between the two perspectives, however, is that IS capabilities must be aligned with a firm's business objectives and resources to produce a specific organizational outcome (e.g., Nevo & Wade, 2010; Overby, Bharadwaj, & Sambamurthy, 2006).

Because we examine the impact of Alibaba's IS capabilities on the development of its MSP and how they might be replaced or transformed over time, we need to understand the various types of IS capabilities that could potentially influence MSP development. Following a review of the various typologies of IS capabilities in the existing literature (refer to Table 2), we eventually adopted Wade and Hulland's (2004) taxonomy to guide our inquiry because "it is probably one of the most coherent and comprehensive taxonomies, and it explicitly addresses outwardly facing IS capabilities, in addition to the more commonly considered internally focused ones" (Doherty & Terry, 2007, p. 103). The latter quality makes it particularly appropriate for informing our study because developing MSPs involves and impacts a host of diverse entities beyond a single firm's boundaries (Rochet & Tirole, 2006).

Table 2. Selected Typologies of IS Capabilities

Source	Typology of IS capabilities	Phenomenon of interest
Mata et al. (1995)	Customer switching costs Access to capital Proprietary technology Technical IT skills Managerial IT skills	IT and sustainable competitive advantage
Powell & Dent-Micallef (1997)	Human resources (Open organization, open communications, consensus, CEO commitment, flexibility, IS/strategy integration) Business resources (Supplier relationships, supplier-driven IT, IT training, process redesign, teams, benchmarking, IT planning) Technology resources (ITs)	IT and competitive advantage
Feeny & Willcocks (1998a, 1998b); Wilcocks, Feeny, & Olsen (2006)	IS/IT governance Business systems thinking Relationship building Designing technical architecture Making technology work Informed buying Contract facilitation Contract monitoring Vendor development	Core capabilities of IS function
Bharadwaj, Sambamurthy, & Zmud (1999)	IT business partnerships External IT linkages Business IT strategic thinking IT business process integration IT management IT infrastructures	Conceptual definitions and empirical operationalization of IT capabilities
Bharadwaj (2000)	IT infrastructure Human IT resources (Technical IT skills, managerial IT skills) IT-enabled intangibles (Customer orientation, knowledge assets, synergy	IT and firm performance
Montealegre (2002)	Capability to strategize Capability to be flexible Capability to integrate and engender trust Key resources (Leadership, culture, IT, long-term view, networks)	e-Commerce capability development

Table 2. Selected Typologies of IS Capabilities (cont.)

Source	Typology of IS capabilities	Phenomenon of interest
Sambamurthy et al. (2003)	IT competence Digitized process reach Digitized process richness Digitized knowledge rich Digitized knowledge richness	IT and enterprise agility
Bhatt & Grover (2005)	Intensity of organizational learning Relationship infrastructure IT business expertise IT infrastructure quality	IT and competitive advantage
Piccoli & Ives (2005)	Technical skills IT management skills Relationship asset IT assets (IT infrastructure, information repository)	IT and sustainable competitive advantage
Ravichandran & Lertwongsatien (2005)	IS human capital (IS personnel skill, IS human resource specificity) IT infrastructure flexibility (Network & platform sophistication, data and applications sophistication) IS partnership quality (Internal partnership quality, external partnership quality) IS planning sophistication Systems development capability IS support maturity IS operations capability	IT and firm performance
Wade & Hulland (2004)	Manage external relationship Market responsiveness IS business partnerships IS planning and change management IS infrastructure IS technical skills IS development Cost effective IS operations	IS capabilities from the perspective of the RBV
Karimi et al. (2007)	Knowledge resources (Business process knowledge, project management knowledge) Relationship resources (user involvement, top management involvement) IT infrastructure resources	ERP capability development and business process outcomes
Tarafdar & Gordon (2007)	Knowledge management Collaboration Project management Ambidexterity IT/innovation governance Business IS linkage	IT and process innovation
Stoel & Mulhanna (2009)	Internally focused IT capabilities Externally focused IT capabilities	IT and firm performance

In their paper, Wade and Hulland (2004) distill the myriad of IS capabilities described in prior literature into eight key IS capabilities (see Table 3). Based on the typology of organizational capabilities that Day (1994) develops, they further organize the eight IS capabilities into three broad categories: 1) outside-in IS capabilities, which refer to externally focused IS capabilities related to anticipating market needs, understanding competitors, and creating durable relationships with customers; 2) inside-out IS capabilities, which refer to internally oriented IS capabilities deployed in a firm in response to market demands and opportunities; and 3) spanning IS capabilities, which refer to the IS capabilities required to integrate the two previous categories of IS capabilities that derive from both internal and external analyses (for a review, see Wade & Hulland, 2004).

Applying this typology as a theoretical lens to analyze the events, activities, and decisions that transpired at Alibaba, we inductively derive a model of the process of developing MSPs from an IS capabilities perspective to address our research questions.

Table 3. Wade and Hulland's (2004) Typology of IS Capabilities[1]

Capability	Definition
Outside-in IS capabilities	
External relationship management	Firm's ability to manage the relationships between its IT function and external stakeholders.
Market responsiveness	Firm's ability to sense and respond to changes in the external environment (Overby et al., 2006).
Inside-out IS capabilities	
IS infrastructure	Physical IT assets including hardware, software, and networking technologies (Bharadwaj, 2000).
IS technical skills	Relevant and updated technology skills related to hardware and software held by a firm's IT employees.
IS development	Capability to develop or experiment with new technologies.
Cost-effective IS operations	Firm's ability to provide cost-effective and efficient IS operations on an ongoing basis.
Spanning IS capabilities	
IS-strategy alignment[2]	Firm's ability to integrate its business strategy, IS strategy, business infrastructure, and IT infrastructure (Henderson & Venkatraman, 1999).
IS planning	Firm's ability to plan, manage. and use appropriate technology architectures and standards.

[1] Unless otherwise indicated, we derive all definitions from Wade and Hulland (2004)

[2] We use the term IS-strategy alignment here as opposed to the original term IS-business partnerships (manage internal relationships) because we felt that they captured the essence of the construct more adequately (see Wade & Hulland, 2004).

3. Research Methodology

The case research methodology is particularly appropriate for this study for several reasons. First, case research is particularly appropriate for examining processes (Gephart, 2004; Majchrzak, Rice, Malhotra, King, & Ba, 2000) and addressing "how" and "why" research questions (Walsham, 1995; Yin, 2003). Our research questions are how questions that delve into the process of MSP development from an IS-capability perspective. Second, because our phenomena of interest, contemporary IS-enabled MSPs, are multi-dimensional and include a social, technological, and business dimension, their inherent complexity makes an objective approach to research difficult (Koch & Schultze, 2011). Consequently, it may be more appropriate to examine the phenomenon by interpreting the relevant stakeholders' shared understanding (Klein & Myers, 1999).

We selected our cases based on two conditions. First, we needed a case organization that had leveraged its IS capabilities to help establish and grow its MSP. Second, the IS capabilities enacted should have been transformed or replaced over time because this would provide us with a dynamic and longitudinal perspective of their role in the MSP's development. The case of Alibaba.com, the largest business-to-business (B2B) e-commerce portal in the world, was particularly appropriate for our purpose because its online MSP is one of the most commercially successful and because the company used a variety of IS capabilities to help develop it throughout its life

3.1. Data Collection

We collected data in three stages. In the first stage, a preparatory stage that lasted from May to June 2008, we conducted preliminary email and phone interviews with several senior managers at Alibaba and its subsidiaries. We used information from these sources to enhance our sensitivity toward Alibaba and its MSP and as a basis for formulating questions for interviews in subsequent site visits

(Darke, Shanks, & Broadbent, 1998). In the second stage, which involved a team of five researchers and lasted from July 2008 to January 2009, we visited Alibaba's headquarters and several of its subsidiaries and platform members multiple times. With five researchers, we could triangulate our interpretations and observations of Alibaba's MSP (Klein & Myers, 1999). In this stage, we conducted a total of 20 interviews with key members of Alibaba's senior management, senior managers of its various business units, and the merchants, advertisers, buyers, and analysts that constituted its MSP. In the third stage, which lasted from May 2009 to December 2012, we conducted 11 follow up face-to-face, phone, email, and instant messaging (IM) interviews to obtain further corroborating evidence for our interpretation of the events that occurred and validate our emergent theory with relevant informants (Pan & Tan, 2011). We stopped at 11 interviews because we had obtained multiple sources of corroborating evidence for all of our key findings (Klein & Myers, 1999).

We conducted all the interviews across all stages with semi-structured interview guides (see Appendix A for a sample) that we designed based on the pertinent themes in the MSP development and IS capabilities literatures (we discuss these themes in Section 5). This approach is less rigid than an explanatory case study that simply seeks to validate pre-formulated hypotheses (Yin, 2003) and balances the generative nature of pure induction with the pragmatism of early structure (Langley, 1999). Each interview guide had a standard core of questions pertaining to the nature of platform development and Alibaba's overarching corporate platform strategy. It also had a section on specific IS capabilities and platform-related initiatives that was tailored to the informant's role the stakeholder group that the individual represented (in the manner of Ferlie, Fitzgerald, Wood, & Hawkins, 2005). We based our email, IM, and phone interviews on similar interview guides but, with the absence of non-textual cues, we took additional care to verify the intent and meaning of the data collected. Each member of our research team examined the data obtained from these interviews carefully and independently to ensure a consistent interpretation (Klein & Myers, 1999) either after they were received (in the case of email) or in real time (in the case of phone and IM). Clarifications and follow-up questions were made if any of the responses were deemed to be ambiguous.

We digitally recorded the face-to-face interviews, which took an average of 90 minutes, and later transcribed them for analysis. We directly extracted the email and conversation logs for the email, phone, and IM interviews. All the interviews were conducted in Mandarin, but, because every member of the research team was bilingual and proficient in both English and Mandarin (including two native speakers of English), we retained and analyzed all the textual data in the original language and only translated at the time of writing. A single member of the research team performed the translations to ensure consistency, but other members carefully examined and validated these translations to ensure coherence (Klein & Myers, 1999). In all, the transcripts, emails, and conversation logs amounted to about 524 pages of textual data.

Moreover, because the development of Alibaba's platform spanned an extended period of time that precluded real-time data collection, we supplemented our interview data with an archival analysis of secondary documents (Mason, McKenney, & Copeland, 1997) to mitigate the possibility of retrospective rationalization on the part of our informants (Glick, Huber, Miller, Doty, & Sutcliffe, 1990),. The secondary data includes news articles, books, internal publications, and information from the corporate website. Because the fourth author had served as a consultant for several projects at Alibaba over the last decade, she was able to independently verify much of the data that was uncovered. Appendix B summarizes the primary and secondary sources of information. The data from secondary sources amounted to approximately 973 pages of textual data and were subject to the same procedures of coding and analysis.

3.2. Data Analysis

We analyzed the data concurrently as we collected it to take advantage of the flexibility that the case research methodology affords (Eisenhardt, 1989). First, we created a chronological timeline of Alibaba's platform development based on our preliminary interviews and constructed a theoretical lens based on the literatures on MSP development and IS capabilities (Pan & Tan, 2011). As part of this lens, we identified an initial set of five aggregate theoretical dimensions and 17 second-order themes (Dacin, Munir, & Tracey, 2010) that were potentially relevant to our inquiry (refer to Table 4). We then used the theoretical dimensions and second-order themes to guide our questions for subsequent interviews (Klein & Myers, 1999).

Table 4. Dimensions and Themes of Theoretical Lens

Theoretical dimension	Second-order themes
MSP development literature	
Enablers of platform development	• Pricing structure (Bakos & Katsamakas, 2008; Rochet & Tirole, 2006) • Sponsor facilitation (Dhanaraj & Parkhe, 2006; Iansiti & Levien, 2004a) • Management of competitive dynamics (Eisenmann et al., 2006) • Identification of platform opportunities (Hagiu, 2009) • Management of platform openness (Eisenmann et al., 2009) • Coring strategy (Gawer & Cusumano, 2008) • Tipping strategy (Gawer & Cusumano, 2008)
Nature of MSP	• Two-sided (Rochet & Tirole, 2003) • Multi-sided (Hagiu, 2009)
IS capabilities literature[1]	
Outside-in IS capabilities	• External relationship management • Market responsiveness
Inside-out IS capabilities	• IS infrastructure • IS technical skills • IS development • Cost-effective IS operations
Spanning IS capabilities	• IS-strategy alignment • IS planning

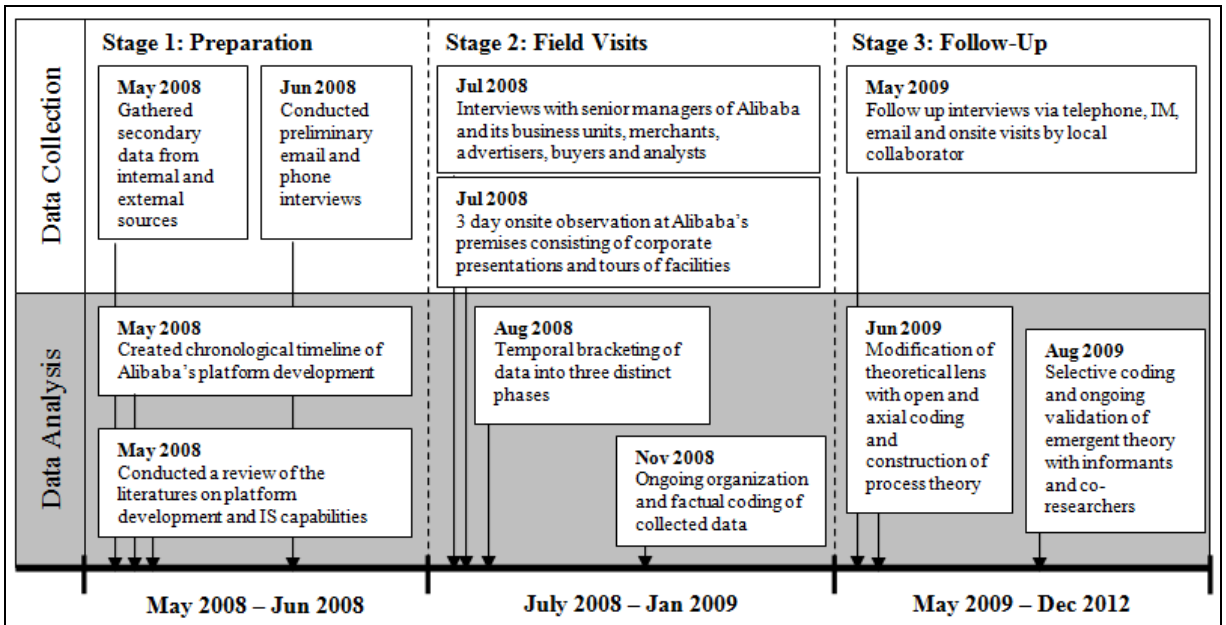
[1] We extracted dimensions and themes from Wade and Hulland's (2004) typology

Second, because the development of Alibaba's MSP was a process that unfolded over an extended period of time, we examined whether the nature of its MSP had evolved over time. From our initial interviews, which provided us with an overview of the phenomenon of interest (Pan & Tan, 2011), we were able to identify three distinct stages of platform development. The first was when Alibaba was a two-sided platform (Rochet & Tirole, 2003) that brought merchants and buyers together at the point of its inception. In this stage, the platform was in a hub-and-spoke configuration because merchants and buyers were not allowed to interact with one another to prevent disintermediation. The second was when a networked configuration emerged with Alibaba's acquisition of Yahoo China and Koubei.com that facilitated interactions and the formation of relationships between the merchants and buyers on the platform. The third was when the two-sided platform became a MSP (Hagiu, 2009) with the launch of initiatives such as Alimama, Aliloan, and Alisoft that introduced advertisers and complementary service providers onto the platform. Accordingly, we adopted a temporal bracketing strategy (Langley, 1999) based on the distinct stages of platform development that emerged to create 1) a frame of reference for comparative analysis and 2) a logical structure to organize the data that we were going to collect in subsequent interviews. Because the progression of the three stages seem to reflect increasing levels of platform maturity (i.e., in terms of size, complexity, and number of participant groups), we refer to the three stages of platform development as the nascent stage, the formative stage, and the mature stage, respectively. We describe e these stages more fully in the case description section.

Third, we used multiple coding techniques (refer to Appendix C) to code and organize the interview data and extend the theoretical lens into a full-fledged process theory (Pan & Tan, 2011). In particular, if a piece of data that did not fit easily in the existing schema emerged, then we modified the theoretical dimensions and second-order themes and the relationships between them with either open or axial coding, respectively (Walsham, 2006). On the other hand, if the emergent data was closely aligned with an existing theme, we used selective coding to associate the piece of data to the conceptual category (Strauss & Corbin, 1998). We verified each new finding to ensure that it was supported by at least two sources of data (Klein & Myers, 1999), and we restarted coding whenever we added, modified, or deleted new theoretical dimensions or second-order themes. By "recursively

iterating between (and thus constantly comparing) theory and data" (Eisenhardt & Graebner, 2007, p. 30) in this way, we inductively derived and gradually shaped our theory.

At various points in the process of data analysis where changes to the emergent theory were particularly significant, we used the visual mapping and narrative strategies (Langley, 1999) to summarize and validate our findings. The visual mapping strategy involved documenting the emergent theory in a series of diagrammatic sketches. The narrative strategy, on the other hand, entailed constructing a "story" that represented our account of what happened. After we constructed the visual maps and the narrative, we verified them with relevant informants (Klein & Myers, 1999). We did this also to ensure the validity of both our interpretation of the events, activities, and decisions that unfolded and our theoretical ideas (Pan & Tan, 2011). We continued this process until we reached theoretical saturation (Glaser & Strauss, 1967), which refers to the state where the inductively derived model can comprehensively account for the case data and "incremental learning is minimal because the researchers are observing phenomena seen before" (Eisenhardt, 1989, p. 545). Figure 1 overviews our research approach and the measures we adopted to ensure the reliability and validity of our findings.



Measures to Ensure Reliability	Measures to Ensure Validity
✓ Prepared semi-structured interview guides (Ferlie et al., 2005) with questions that are open-ended, yet relevant to the phenomenon of interest	✓ Interviews were conducted by a team of five researchers to enable the validation of interpretations and observations (Yin, 2003)
✓ Collected data from multiple sources to enable triangulation and cross validation (Klein and Myers, 1999)	✓ Theoretical ideas and eventual process theory were repeatedly verified with informants to ensure data-model alignment (Pan and Tan, 2011)
✓ Recorded interviews, checked interview transcripts, as well comparing interview data with secondary sources to ensure the accuracy and completeness of data (Yin, 2003)	✓ Emergent process theory was repeatedly compared with prior studies to establish theoretical support and generalizability (Eisenhardt, 1989)

Figure 1. Overview of Research Approach

4. Case Description

Alibaba is the world's largest B2B e-commerce portal with over 80 million registered users worldwide. Its business focuses on providing a trading platform that connects international buyers to suppliers in China for virtually any product. Alibaba was founded in the city of Hangzhou in March 1999 when its

iconic founder, Jack Ma, saw an unmet need for a B2B platform that connected the millions of small and medium-sized enterprises (SMEs) in China to customers all over the world (People Daily Online, 2007). Within a relatively short span of 13 years, Alibaba grew from a small e-commerce startup that operated out of Ma's apartment to a publicly listed multi-national corporation with an annual revenue that was estimated at US$1.02 billion in 2011. Behind Alibaba's commercial success lies a vibrant and populous online MSP. By the first quarter of 2012, Alibaba's MSP had attracted 27.3 and 52.4 million international and Chinese members, respectively, and it continues to grow at a rate of 41.6 percent annually. Driving the phenomenal growth of its MSP over the years, in turn, was several platform strategies that were facilitated by an evolving set of IS capabilities.

4.1. Catering to an Unmet Need (1999-2004)

From its inception up to around 2004, Alibaba's objective focused on establishing itself as the de facto B2B platform for SMEs in China. Because Alibaba was essentially seeking to become a two-sided platform (Rochet & Tirole, 2003) that brought merchants and buyers together, we classified this period as the first stage of its development. To facilitate its objective in this stage, Alibaba adopted two platform development strategies. First, when Alibaba first entered the market in 1999, many of the SMEs lacked the technical capabilities to go online because Internet penetration was very low in China at the time. Consequently, Alibaba sought to increase the ease of participation on its platform by helping the SMEs that lacked technical capabilities to collate, organize, publish, and promote their corporate and product information on its website. A gold supplier on Alibaba's B2B platform explained:

> *You didn't need to know how to create your own website and publish your own information… Alibaba would collect this information and publish it on the Internet on our behalf. So you might not know anything about the Internet, but yet you are online and have an e-commerce website. It was a big deal at the time*.

Second, Alibaba leveraged its technological infrastructure, technical expertise (accumulated from the experience of developing ChinaPages and ChinaMarket, Ma's previous e-commerce ventures), and understanding of local business practices to establish a unique value proposition. For instance, they launched Alipay and Trustpass to mitigate the greater mistrust of online transactions among Chinese firms. Alipay was an online escrow service that was unique in the Chinese market at the time, and Trustpass was an extensive online credit verification, identity authentication, and certification service that integrates third-party certification, comments, and feedback from previous customers and the records of previous transactions on the Alibaba platform. In addition, recognizing the propensity for haggling and price negotiations in Chinese business transactions, they launched Wangwang (an instant messaging system) in support of their B2B and C2C platforms. Through these initiatives, Alibaba was able to tailor its offering to cater to the needs of the immense SME market. A buyer on Taobao, Alibaba's C2C platform, explained:

> *What Alibaba did really well was provide a mode of transactions that was attuned to the way we are used to doing things. I could bargain with the seller using Wangwang… I could receive my goods first and pay later with Alipay… These are not possible with eBay* [China].

By lowering the barriers of participation, Alibaba was able to attract a myriad of SMEs to join its platform. In addition, by providing a unique value proposition, Alibaba was able to entrench itself at the center of value creation. Consequently, it formed a hub-and-spoke, two-sided platform consisting of merchants and buyers. Its centrality in the platform, in turn, enhanced Alibaba's ability to sense its customers' needs because Alibaba was able to collect feedback directly from the other entities in the platform. Moreover, because Alibaba's organizational actions were enacted at the center of the network, its actions impacted the entire platform concurrently, which enabled a quicker response to its customers' needs. Table 5 presents the dimensions and themes that we found to be salient in this stage and their supporting evidence. We discuss the derivation of these dimensions and themes in Section 5.

Table 5. Dimensions, Themes, and Data in the Nascent Stage (1999-2004)

Dimensions and second-order themes	Representative data
1. Outside-in IS capabilities	
A. Market responsiveness	A. *[Jack] Ma… saw the business opportunity early. He knew that there would be a huge demand for Chinese products in the West [with China's entry into the WTO]. He wanted China to be the factory of the world… There were many SMEs in China but most of them lacked the channels and bridges to communicate with the world. [Alibaba] came out at the right time and successfully filled this role.* (Alibaba B2B Seller A)
2. Spanning IS capabilities	
B. IS-strategy alignment/ IS planning	B. *We were the first to cater exclusively to the needs of SMEs. As a result, our networking platform, the trust supporting mechanisms we used, and our payment systems were all geared towards meeting the needs of this particular segment. This was what differentiated us from the other B2B platforms in the beginning –* (Taobao VP of Customer Relations)
3. Inside-out IS capabilities	
C. IS infrastructure	C. *Trustpass and Alipay were some innovations… but most of the technological initiatives we introduced… like "Wangwang"… were more the application of existing technologies in innovative ways.* (Alibaba VP of Research & Training)
D. IS technical skills	D. *The experience from managing ChinaPages [and later ChinaMarket] was instrumental to Alibaba's [initial] success. It was here that they picked up the technical skills of website development and learnt what it took to run a B2B e-commerce portal…* (Alibaba B2B Seller A)
4. Enablers of platform development	
E. Tipping strategy	E. *We helped to collate, organize and publish [our members'] information on our website… we organized the information by product category and provided search functionality to lower the cost of finding the information…. we went to different websites to promote Alibaba, telling people that business opportunities and all kinds of products from all over the globe can be found on our website…* (Alibaba B2B GM)
F. Coring strategy	F. *There were three factors that differentiated us from our foreign competitors. First, we provided tools like "Wangwang" [which allowed transacting parties to haggle over prices] and "Alipay" [which helped mitigate the greater mistrust of online transactions among Chinese firms]. Second, we provided our services free of charge. Third, our websites were designed to suit to our Chinese culture.* (Alipay VP of Strategy)
5. Nature of MSP	
G. Hub-and-spoke*	G. *Alibaba was one of the first platforms that linked international buyers to Chinese suppliers… They were providing a valuable service, but they had to be careful because if the transacting parties can interact with one another outside of their platform, then Alibaba [would become] redundant.* (Alibaba B2B Gold Supplier)

* Indicates an inductively derived dimension or theme that is not part, or is an extension, of the initial theoretical lens.

4.2. Mitigating the Threat of Envelopment (2005-2006)

Having established itself as the de facto B2B platform in China by the end of 2004, Alibaba's management began to realize that the biggest threat to its business came not from the other B2B platforms, but rather from massive Internet portals such as Baidu and Google because global buyers looking for products, services, and business opportunities from Chinese firms and vice versa could potentially find them by searching on these Internet portals. This is a situation known as "platform envelopment" (Eisenmann, Parker, & Van Alstyne, 2011), where platform sponsors extend their platform's functionality to overlap with those of another to leverage its existing members and resources in entering a new market. Consequently, Alibaba began to move in a new strategic direction to counter the envelopment threat (Eisenmann et al., 2006) in 2005. Because its new strategic direction resulted in the emergence of a networked configuration in its platform, we classified this period as the second stage of its development. This new strategic direction, in turn, was facilitated Alibaba's adopting two different platform development strategies.

First, Alibaba acquired Yahoo China in October 2005. The original intent behind the acquisition was simply to acquire search engine capabilities to rival those of the Internet portals. However, when Alibaba tried to isolate the information of its platform members from the reach of the Internet portals by turning Yahoo China into a proprietary, business-oriented portal, an unanticipated consequence was that it served to lock its members in and, in the process, fortify its platform boundaries. To date, most of the information published on the Alibaba network can no longer be accessed by third party search engines. According to a Yahoo China user: "All the information on the Alibaba network are only visible on Yahoo China. So very quickly, everyone knew that if you are searching for business related things, Yahoo China is the search engine to turn to".

Second, in October 2006, Alibaba acquired Koubei.com, an online lifestyle portal. Like in the case of Yahoo China, Alibaba acquired Koubei because the former's management felt that the portal would be complementary to Alibaba's B2B and C2C businesses. However, over time, Alibaba's management began to realize that Koubei brought about two important benefits. First, Koubei served to strengthen the sense of community in the platform by enabling its members to "work, spend, and play" on Alibaba. Second, Koubei facilitated greater interactions between platform members by encouraging them to spend more time on the Alibaba network. A user of Koubei remarked: "Koubei is a great tool. You could search for other businesses and leave reviews for them. And it is seamlessly connected to the other Alibaba websites like Taobao".

By acquiring Yahoo China, Alibaba was able to demarcate the boundaries of its MSP and consolidate its position at the center of the platform. In addition, by acquiring Koubei, Alibaba enabled richer and more frequent interactions between members, which facilitated the formation of informal, autonomous networks in its platform. The result was the formation of a networked, two-sided platform. This, in turn, culminated in strategic benefits for Alibaba because it was able to move beyond simply sensing and responding to expressed member needs to monitoring and analyzing the interactions between its members to anticipate and predict future and unexpressed needs. Table 6 shows the dimensions and themes that we found to be salient in this stage and their supporting evidence. We discuss the derivation of these dimensions and themes in Section 5.

4.3. Pursuing a Digital Ecosystem Strategy (2007-Present)

Alibaba's strategy in the second stage of its development led to performance gains that outstripped all initial expectations. Between 2005 and 2006, Alibaba registered an 88.1 percent increase in revenue, an astounding 212 percent increase in net profits, and an 80.1 percent growth in terms of the number of registered members. These phenomenal results alerted Alibaba's management to the strategic potential of an organic, self-organizing platform. Moreover, Alibaba's management realized that promoting self-organization could be a means of reducing their operating costs since platform members would take ownership of some of the functions that Alibaba previously supported. For example, members could create advertisements and buy advertising space on their own as opposed to having Alibaba promote their websites for them. Motivated by these insights, Alibaba began to enact several initiatives to foster a healthy and symbiotic business ecosystem.

Table 6. Dimensions, Themes, and Data in the Formative Stage (2005-2006)

Dimensions and second-order themes	Representative data
1. Outside-in capabilities	
A. Market responsiveness	A. *By 2005, we basically did not perceive other B2B portals as our competitors any more. We only saw Baidu and Google as our rivals. Information is the lifeblood of both Alibaba and the search engines. Now that millions of our SME customers all have their own websites, search engines can potentially grab their information off the internet and use it for their own purposes.* (Alibaba VP of Research & Training)
B. External relationship management	B. *The acquisition of Yahoo China and Koubei is strategic for Alibaba as it locks them in and enables them to forge stronger relationships with their members, and between the members themselves.* (Analyst B)
2. Spanning IS capabilities	
C. IS-strategy alignment/ IS planning	C. *It was a pre-emptive strategy to counter our rival Baidu... Our intention was to gain access to the search engine [and community building] technologies. After acquiring them, we can create an Internet business fortress [to defend against our rivals] by combining "E", community, search, and instant messaging to enhance our B2B and C2C businesses.* (Yahoo Koubei Customer Relations Manager)
3. Enablers of platform development	
D. Encapsulating strategy*	D. *By integrating e-commerce [Alibaba] with an Internet portal [Yahoo China]… we can increase the stickiness, breadth and depth of our business... Currently, most of the information published on our network have been sealed off from [third party search engines like] Baidu*. (Yahoo Koubei Customer Relations Manager)
E. Delegating strategy*	E. *Alibaba served as a platform for exchanging information, communications and interactions, as well as transactions. With Yahoo and Koubei, Alibaba was also the platform for members to search for and review one another… we cannot force them to use our platform exclusively. But if we provide them with these tools, at least even if they form their own connections, we can keep them within Alibaba's network*. (Alibaba VP of Research & Training)
4. Nature of MSP	
F. Networked*	F. *… both Yahoo [China] and Koubei encourage interactions and the formation of bonds between our members, helping the SMEs and individual users on our network to live, grow, develop and create leading-edge networks [between themselves].* (Yahoo Koubei Customer Relations Manager)

* Indicates an inductively derived dimension or theme that is not part, or is an extension, of the initial theoretical lens.

In January 2007, Alibaba launched Alisoft, an online software portal based on a software-as-a-service (SaaS) model to develop and provide Alibaba's platform members with a comprehensive suite of low cost, user-friendly Web-based enterprise applications to meet their business IT needs. Around mid-2007, Alibaba launched Aliloan, an initiative in partnership with the Industrial and Commercial Bank of China and the China Construction Bank to help SMEs with limited assets or credit history secure financing for business expansion based on their transaction histories and credibility ratings at Alibaba. Finally, in November 2007, Alibaba launched Alimama, a trading platform for online advertising space to enhance the capability of its platform members for online marketing and generating online advertising revenue. A "5-star" seller on Taobao described these initiatives:

> *Alimama enabled me to make money off my existing website… If I needed any software, like CRM software for example, I can get them from Alisoft… Aliloan is particularly useful for smaller companies… They can use the money to manage their cash flow…* [or] *grow their business.*

Because the initiatives introduced new entity types to Alibaba that transformed it into a multi-sided platform (Hagiu, 2009), we classified this period as the third stage of its development. More importantly, the launch of these initiatives corresponds to two important platform development strategies. First, Alibaba was able to enhance the organizational capabilities of its platform members so that they became better equipped to contribute toward the overall competitiveness of the platform in the long run. Second, by helping its members, Alibaba hoped that its platform members would not only be more capable but also become more motivated to contribute to the collective goals of the platform. A user of Alibaba's B2B platform explained: "Alibaba was really promoting this idea that we are all in it together. They provide these services for us at a subsidized cost in hope that everyone benefits and in turn, contribute to the community as a whole". The result was a symbiotic, multi-sided platform that consists of not only buyers and sellers but also advertisers, complementary service providers such as software developers, and financial institutions. By fostering a spirit of symbiotism through these strategies, Alibaba mobilized its platform members for the platform's collective goals. Consequently, members were not only able to better participate on Alibaba's platform but also more committed, which raised the platform's overall competitiveness. Table 7 shows the dimensions and themes that we found to be salient in this stage and their supporting evidence. We explain the derivation of these dimensions and themes in Section 5.

Table 7. Dimensions, Themes, and Data in the Mature Stage (2007-Present)

Dimensions and second-order themes	Representative data
1. Outside-in IS capabilities	
A. Market responsiveness	A. *The period that we grew most rapidly was right after we opened up the platform [i.e. by allowing the formation of autonomous, informal networks]. I think our revenue almost doubled during the time… That got us thinking: What if we opened up our platform further? What if we let our members have greater control over the way they operated on Alibaba?* (Alibaba B2B GM)
2. **Spanning IS capabilities**	
B. IS-strategy alignment & IS planning	B. *The purpose of the ecosystem strategy is to reduce our operating costs, and provide high quality support to enable the weaker members on our platform to emerge on the surface… Our strategy was to use IT to help them improve their operations… Alisoft was one way… Platforms like Alimama were another…* (Alisoft Executive VP)
3. Outside-out capabilities*	
C. Platform IS Leadership*	C. *By providing services and opportunities to the "bit players" in our ecosystem, they attract more "bit players" into the ecosystem… With a very large volume of these small players working synergistically for the collective good of the ecosystem, Alibaba's profitability increases, and we have more resources to invest in enhancing our service platforms… This virtuous cycle results in a healthy ecosystem that is beneficial for all ecosystem members.* (Alibaba VP of Operations)
4. Enablers of platform development	
D. Empowering strategy*	D. *With access to more advertising revenue [through Alimama]… capital [through Aliloan]… [and] enterprise applications [through Alisoft] that help us manage our information… we are able to grow our business and operate more efficiently and effectively.* (Taobao 5 Star Seller A)
E. Meshing strategy*	E. *With these services, my business has become more dependent on Alibaba… we depend more on each other [other platform members] as well because our we have more transactions with one another… when you realize this, of course you'd want everybody to do well. When you have a strong business partner, you'd become strong as well.* (Alibaba B2B Seller B)

Table 7. Dimensions, Themes, and Data in the Mature Stage (2007-Present) (cont.)

Dimensions and second-order themes	Representative data
5. Nature of MSP F. Symbiotic*	F. *Alibaba is no longer just a platform that brings buyers and sellers together. Now we have the software developers… advertisers… (and) financial institutions in the network as well. The entire platform has become an ecosystem of business entities.*(Alibaba B2B User C)

* Indicates an inductively derived dimension or theme that is not part, or is an extension, of the initial theoretical lens.

5. Discussion

By integrating the different patterns of MSP development across the nascent, formative, and mature stages at Alibaba, one can inductively derive a model of the MSP development process at Alibaba from an IS capability perspective (refer to Figure 2). In particular, our case data reveals a process that traversed three phases in each stage: 1) initiating MSP development, 2) enabling platform strategy, and 3) enacting MSP development. In this section, we explain how we constructed the model and how it enriches the existing perspectives of MSP development.

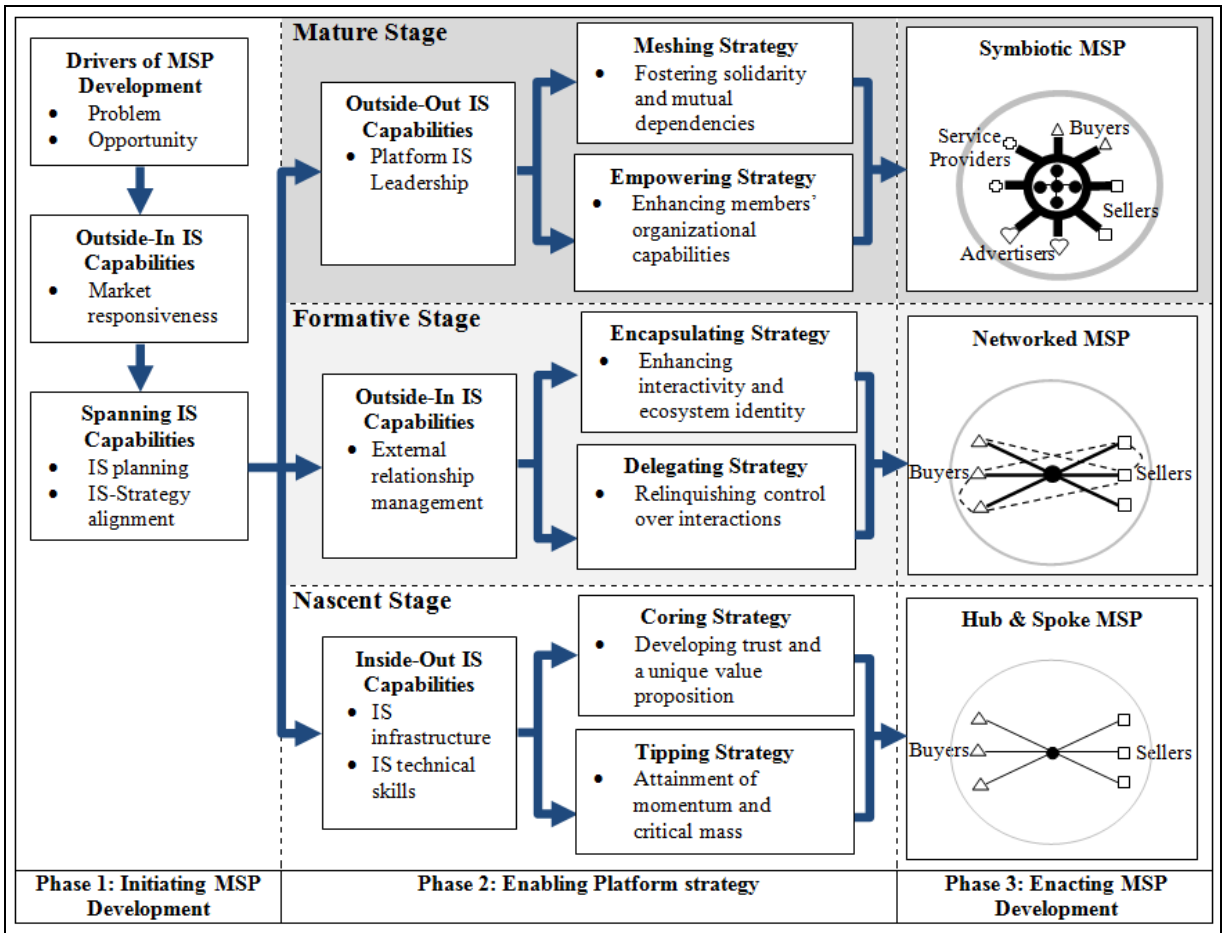


Figure 2. Process Model of MSP Development

5.1. Initiating MSP Development

While existing studies in the platform development literature have uncovered a variety of enabling factors (e.g., Dhanaraj & Parkhe, 2006; Eisenmann et al., 2006), our process model complements them by suggesting that effective MSP development begins with an initiation phase that occurs pre-development. This initiation phase, seen across the three stages of platform maturity at Alibaba, is triggered by the manifestation of a driver in the organizational environment, which might be in the form of not only an opportunity (as Hagiu (2009) suggests) but also a problem (Weick, Sutcliffe, & Obstfeld, 2005). However, the mere presence of a driver in the external or internal organizational environment could be insufficient. Our model suggests that, in the context of MSP development, several IS capabilities are also required and that they should be applied in a particular sequence.

First, market responsiveness's outside-in IS capabilities (Wade & Hulland, 2004) are required to detect and make sense (see Maitlis, 2005) of the driver to act on it. In the case of Alibaba, for example, the instances of market responsiveness that triggered the initiation phase of MSP development include the realization of the unmet need in the Chinese SME market for a value-creating internet platform that connected SMEs to the global market (i.e., an opportunity) in the nascent stage, the awareness of the threat of envelopment (Eisenmann et al., 2011) that stemmed from internet portals such as Baidu and Google (i.e., a problem) in the formative stage, and the realization of the strategic potential of an organic, self-organizing platform (i.e., an opportunity) in the mature stage.

Next, following the detection of a driver, our model reveals the mediating role of the IS-strategy alignment and IS planning capabilities (Wade & Hulland, 2004) in guiding an appropriate response. At Alibaba, these capabilities were manifested in the formulation of an appropriate business strategy and a corresponding IS strategy that facilitated the business strategy in each of the developmental stages. For instance, Alibaba's growth strategy in the nascent stage was facilitated by an IS strategy that that encouraged participation in the nascent stage, while its defensive strategy in the formative stage was supported by an IS strategy aimed at fortifying its platform boundary. Similarly, Alibaba's ecosystem strategy in the mature stage was facilitated by an IS strategy aimed at enhancing the operational capabilities of its platform members. These spanning IS capabilities are the basis for translating the detection of the triggers of MSP development into action because they are higher-order capabilities (see Winter, 2003) that establish direction (Montealegre, 2002). They also enable a firm "to search, explore, acquire, assimilate, and apply knowledge about resources, opportunities, and how resources can be configured to exploit opportunities" (Bhatt & Grover, 2005, p. 261).

After the initiation phase, our model suggests that the MSP development process unfolds with the phases of enabling platform strategy and enacting MSP development. While studies offering prescriptions for effective MSP development in the existing literature have typically not differentiated between the various stages of platform maturity (e.g., Gawer & Cusumano, 2008; Rochet & Tirole, 2006), our process model reveals that the nature and role of IS capabilities in each stage could be vastly different. As such, we organize our discussion of these phases according to the developmental stages in Sections 5.2 to 5.4.

5.2. IS Capabilities in the Nascent Stage of MSP Development

Our process model suggests that, when a platform is first established in the nascent stage of development, the IS capabilities that are crucial and that should be emphasized are the inside-out IS infrastructure and IS technical skills capabilities (Wade & Hulland, 2004). However, these capabilities do not influence MSP development directly. Instead, their impact on MSP development is mediated by the facilitation of two platform strategies: a coring strategy and a tipping strategy (Gawer & Cusumano, 2008). This is in line with the fundamental premise of IS alignment research, which holds that it is not the uncritical use of IS that leads to the attainment of desired outcomes but the complex, multi-point alignment between business and IS strategies, business needs, and systems development priorities and business processes and the enabling technological infrastructure (for a review, refer to Chan & Reich, 2007).

More specifically, the IS technical skills and IS infrastructure capabilities can be integrated in a coring strategy to establish a unique and compelling value proposition that is fundamental to the platform (Gawer & Cusumano, 2008). In Alibaba's case, we can see this in the way it leveraged the experience and technical expertise accumulated over their experience in developing ChinaPages and ChinaMarket (i.e., IS technical skills) to provide mechanisms such as Wangwang and Alipay on their online platform (i.e., IS infrastructure). This, in turn, established institution-based trust (Pavlou & Gefen, 2004) and catered to the nuances of Chinese e-commerce (Martinsons, 2008), which differentiated Alibaba from other local and global B2B portals at this stage.

In addition, the IS technical skills and IS infrastructure capabilities can be applied to support a tipping strategy to help the platform gain market momentum (Gawer & Cusumano, 2008). For instance, by involving itself directly in collating and publishing the trade-related information of its members on its website, facilitating access to the information by organizing the content, providing navigational tools, and promoting the information on other websites for international trade (i.e., IS infrastructure and IS technical skills), Alibaba was effectively subsidizing platform membership for its sellers (Bakos & Katsamakas, 2008; Rochet & Tirole, 2006) because applying these IS capabilities enabled many Chinese SMEs to overcome their technical limitations, participate on their platform, and, subsequently, benefit from the global exposure afforded by the Internet. Lowering the costs of platform participation, in tandem with its unique value proposition, enabled Alibaba to establish itself as the de facto B2B platform for business opportunities in China.

In line with our findings, the existing literature on platforms suggests two reasons for why inside-out IS capabilities are particularly important in the initial stage of MSP development. First, by enabling a coring strategy, they provide the foundation for one to initially form a value-creating MSP (Gawer & Cusumano, 2008). Second, by enabling a tipping strategy, they create cross-group network effects that help attract platform members (Parker & van Alstyne, 2005; Rochet & Tirole, 2006), impose switching costs (Pierce, 2009), and reduce the necessity of multi-homing (i.e., when a platform member joins multiple platforms (see Armstrong, 2006) to facilitate their retention. Attracting and retaining platform members is especially crucial to a platform in a fledgling state because, in platform competition, there is usually a strong need to "amass users as quickly as possible" (Eisenmann et al., 2006, p. 100).

By supporting a coring strategy, our process model suggests that the inside-out IS capabilities IS infrastructure and IS technical skills can enable a platform sponsor to entrench itself at the center of the network on the basis of its control over the foundational technological infrastructure (Teece, 2007). In addition, by facilitating a tipping strategy, these capabilities can enable a platform sponsor to attract members and attain self-sustaining critical mass (Gawer & Cusumano, 2008). In tandem, attaining network centrality and critical mass gives rise to a hub-and-spoke configured platform. At Alibaba, this platform was an archetypal two-sided platform consisting of global and Chinese buyers on one end and sellers predominantly made up of Chinese SMEs on the other. This hub-and-spoke platform represents the most basic form of MSP and would be a particularly appropriate development goal in the earliest stage of platform development because, with network centrality, the sponsor would be able to provide the services and infrastructure to enable interactions and exchanges between the different groups of entities (Eisenmann et al., 2009). Moreover, with critical mass, cross-side network effects would be established between them (Bakos & Katsamakas, 2008). The case of Alibaba further provides an indication of the strategic benefits of this MSP form. A sponsor at the heart of a hub-and-spoke platform would have immediate ties with the other entities on it, which would enable the sponsor to solicit direct feedback and, thus, provide it with critical information on the current and expressed needs of these members (Koka & Prescott, 2008). Moreover, organizational actions taken in response to the expressed needs of a small subset of members at the center of the platform would benefit all entities in the platform concurrently (Blyler & Coff, 2003).

5.3. IS Capabilities in the Formative Stage of MSP Development

After a hub-and-spoke configuration is established, our model suggests that the outside-in IS capability external relationship management (Wade & Hulland, 2004) should be emphasized in the next formative stage of MSP development. At Alibaba, this capability was manifested in its acquiring a search engine (i.e., Yahoo China) and an online lifestyle portal (i.e., Koubei). These initiatives

correspond to the outside-in IS capability external relationship management (Wade & Hulland, 2004) because their primary function was to facilitate the coordination of buyers and suppliers (Bharadwaj, 2000) by allowing them to search for (i.e., using Yahoo) and form independent relationships (i.e., using Koubei) with one another. Once again, the effect of this IS capability on MSP development is not direct. Instead, based our case study, our model suggests that the capability should be leveraged in support of what we term an encapsulating strategy and a delegating strategy to give rise to a desired organizational outcome (Nevo & Wade, 2010).

Extending the platform development strategies that Gawer and Cusumano (2008) propose, we define an encapsulating strategy as a set of activities that a sponsor can use to fortify platform boundaries and promote a collective identity in a platform. In our case study, this strategy was manifested in the way Alibaba was able to use Yahoo (i.e., external relationship management) to restrict external access from search engines such as Google and Baidu to the information of its platform members. In addition, we define a delegating strategy as a set of activities used to promote self-governance and grant platform members autonomy over the interactions and transactions that happen in the platform. At Alibaba, this strategy was manifested in the way it leveraged Yahoo and Koubei (i.e., external relationship management) to enable its platform members to form informal, autonomous networks between themselves, and to further enhance the interactivity in the platform.

Prior studies on platforms corroborate our findings and provide two reasons for why these platform development strategies, facilitated by external relationship management, are particularly important in the formative stage of development. First, after the initial stage of MSP development when the MSP is growing rapidly, platform growth may expand the scope of the platform or attract new entrants to increase the threat of envelopment (Eisenmann et al., 2006, 2011). Consequently, an encapsulating strategy enabled by an effective external relationship management capability can allow the platform sponsor to mitigate this threat by strengthening the collective identity (Ma & Agarwal, 2007) and fortifying platform boundaries (Eisenmann et al., 2006). Second, platform growth may render the sponsor's deep involvement in all the transactions of platform members impossible (Hagiu, 2009). Moreover, prior studies on other forms of virtual networks have shown that larger networks tend to be resistant to direct management by the network sponsor (Mohammed, Fisher, Jaworski, & Paddison, 2004; Walden, 2000). As a result, a delegating strategy enabled by a strong external relationship management capability can allow the platform sponsor to manage the problems associated with growth by promoting self-organization among platform members (Ghazawneh & Henfridsson, 2010).

With the fortification of platform boundaries and the emergence of autonomous, informal networks, our process model suggests that the developing MSP would transition from the basic hub-and-spoke configuration to a more sophisticated networked configuration. With the networked configuration, members would be allowed to interact and collaborate freely in a protected space, which would result in greater platform openness (Parker & van Alstyne, 2008). Because platform openness, in turn, stimulates innovation to increase cross-side network effects and the platform's scalability (Eisenmann et al., 2009), the networked configuration can be seen as an appropriate development goal after the nascent stage. The potential strategic benefits of this form of MSP were also revealed in Alibaba's case. More specifically, a networked platform may confer strategic benefits by allowing a platform sponsor to move beyond sensing and responding reactively to the existing and expressed needs of its members toward monitoring and analyzing the interactions between its members to anticipate future and unexpressed needs and, subsequently, respond proactively to those needs (Chandra & Kumar, 2001).

5.4. IS Capabilities in the Mature Stage of MSP Development

Finally, after attaining the networked configuration, our process model suggests that the ability to manage, develop, and marshal the collective IS capabilities of platform members should be emphasized in the mature stage of MSP development. We term this ability platform IS leadership and categorize it as an outside-out IS capability. Extending prior taxonomies (Day, 1994; Wade & Hulland, 2004), we define outside-out IS capabilities as externally-oriented IS capabilities that are deployed and reside outside the firm and that create more value for external entities than the organization that deploys them. As in the earlier stages, our findings reveal that the impact of this IS capability on MSP development once again lies in its facilitation of two platform strategies. One strategy is centered on fostering solidarity and mutual dependencies among platform members. We term this a meshing

strategy and define it as a set of activities used by a sponsor to strengthen inter-relationships and promote collectivism in a platform. The second strategy is centered on enhancing the platform members' ability to participate and contribute on the platform. We term this an empowering strategy and define it as a set of activities used by a sponsor to enhance the operational capabilities of platform members through direct intervention or indirect facilitation.

As an illustration, at Alibaba, platform IS leadership was enacted with the launch of key IT initiatives such as Alisoft, Aliloan, and Alimama. These initiatives were distinct from those of the earlier stages in that they in that they provided little direct benefits for Alibaba and were aimed at upgrading the abilities of their platform members to obtain enterprise applications, loans, and advertising revenue, respectively (i.e., an outside-out IS capability). Through these IT initiatives, Alibaba was able to expand its platform to include a greater variety of entities such as applications developers, banks, and advertisers and deepen the relationships between platform members by fostering mutual dependencies in a meshing strategy. In particular, the latter happens as the extent of engagement between members (e.g., trading advertising space in addition to monetary exchanges) and with the platform sponsor (e.g., providing enterprise applications and additional services in addition to simply being a trading platform) increases.

In addition, these IT initiatives provided Alibaba's platform members with the means to enhance their operations and overall performance. For example, Aliloan provided smaller SMEs that faced difficulties in obtaining loans with the means to do so based on their trading and credit history on Alibaba. In a similar vein, Alisoft provided members who were unable or unwilling to spend on expensive, off-the-shelf software packages with access to the necessary enterprise applications that could facilitate their business needs. Likewise, Alimama provided platform members with access to potential advertisers and the means of generating revenue from online advertising. These form an empowering strategy that translates to improvements in the platform members' 1) business expansion (by enhancing their ability to obtain funding), 2) IS (by supporting their business processes with the appropriate software), and 3) revenue generation (by opening up a new revenue stream) capabilities.

Research on mature platforms suggest two reasons for why the meshing and empowering strategies enabled by platform IS leadership were particularly salient to Alibaba's MSP's development in the mature stage. First, a mature platform can be difficult to manage because the sheer size of its membership base increases the volume and complexity of platform activities, which "create a great deal of information asymmetry and strategic uncertainty" and make it "a challenge simply to maintain 'coherence'" (Boudreau & Hagiu, 2009, p. 167). Consequently, a meshing strategy can be a means of coordinating the activities of platform members in lieu of feasible mechanisms for direct management because it fosters mutual dependencies that promote solidarity and collective action (Adler & Kwon, 2002) and that provide the foundation for stability, productivity, and creativity in the platform (Iansiti & Levien, 2004a). Second, platform sponsors can often extract a significant amount of economic value from a mature platform (Iansiti & Levien, 2004a). But, in doing so, their commercial success may attract new entrants seeking to usurp their leadership role (Eisenmann et al., 2009). An empowering strategy may, therefore, be important because, by strengthening the organizational capabilities of their platform members, the sponsor enhances its goodwill and relationship with these entities, which, in turn, increases platform loyalty (Adler & Kwon, 2002). Moreover, by facilitating platform capability development and becoming more valuable to the other entities, the sponsor can simultaneously gain power and control in the platform (Brown & Eisenhardt, 1997).

The meshing strategy, in fostering mutual dependencies, promotes solidarity and the motivation for collective action (Adler & Kwon, 2002). The empowering strategy, on the other hand, improves the capabilities of existing members for pursuing collective goals (Iansiti & Levien, 2004a). With the heightened motivation and ability for collective action, our process model suggests that the networked MSP of the previous phase would be transformed into a symbiotic MSP characterized by a co-evolving, collaborative, and self-reinforcing system of strategic contributions (Moore, 1996). As Alibaba's case reveals, this form of MSP represents a highly sophisticated and strategic state of platform development because, because the entire platform functions as a single entity that uses communal resources and capabilities for the platform's shared objectives, individual platform members may be engaged in the co-production of innovations (Lengnick-Hall, 1996). This 1)

invalidates the need to sense or anticipate its members' needs, 2) enables the concurrent development of a near-infinite range of personalized innovations, and 3) provides the strongest assurances that the innovations pursued are in line with those needs (Tan, Pan, & Hackney, 2010) since the innovations are tailor-made for platform members by the members themselves.

In summary, our model provides some answers to the research questions set forth at the beginning of this paper. In relation to our first question (i.e., how did the IS capabilities of Alibaba influence the formation and growth of its MSP?), our model reveals that the IS capabilities of Alibaba influenced the formation and growth of its MSP by facilitating several platform strategies: a coring strategy and a tipping strategy in the nascent stage (see Gawer & Cusumano, 2008), an encapsulating strategy and a delegating strategy in the formative stage, and a meshing strategy and an empowering strategy in the mature stage. In relation to our second research question (i.e., how did Alibaba's IS capabilities evolve with the development of its MSP over time?), our model suggests that Alibaba acquired or developed different categories of IS capabilities and subsequently leveraged them to derive important developmental and strategic outcomes in each stage of MSP development. In particular, the leverage of its inside-out, outside-in, and outside-out IS capabilities were emphasized in the nascent, formative, and mature stage, respectively.

6. Conclusion

6.1. Theoretical Contributions

At the outset of this paper, we note how there was a lack of research on MSP development from an IS capability perspective even though the MSPs that growing into dominance in the contemporary business landscape are underpinned by IS (Yoo et al., 2007). This study is one of the earliest to contribute towards addressing this gap and, in the inductively-derived theory we present, we make several important theoretical contributions. First, while prior research on MSPs have looked at various aspects of platform development (e.g., Dhanaraj & Parkhe, 2006; Eisenmann et al., 2006), our process model underscores the need to pay attention to an initiation phase that occurs prior to the development process. In particular, our study has pointed out that platform development is typically initiated by an environmental trigger and, more importantly, the IS capabilities of market responsiveness, IS planning and IS-strategy alignment are required to detect the driver and translate this into action.

Second, while prior studies have discussed the importance of the coring and tipping strategies in platform development (Gawer & Cusumano, 2008), our study has contributed to the state of existing knowledge by identifying four new types of platform development strategies that are grounded in the evidence of our case study. More specifically, the encapsulating, delegating, meshing, and empowering platform development strategies that our model proposes to be particularly salient in the latter stages of MSP maturity are all conceptual innovations. Complementing the existing work in this area, our study can serve as a signpost for future studies seeking to flesh out these concepts or as the basis for developing a typology of platform development strategies.

Third, prior studies on MSP development have typically not differentiated between the various stages of platform maturity when identifying the enablers of platform development (e.g., Dhanaraj & Parkhe, 2006; Eisenmann et al., 2006). This is a potential issue because our findings reveal that different factors could be particularly salient in each stage. By presenting a process model that outlines how a platform may transition from a hub-and-spoke MSP to a networked MSP before eventually becoming a symbiotic MSP, our study can serve as the foundation for the development of a platform maturity model. To the best of our knowledge, there are no maturity models as yet in the existing MSP literature. Maturity models can be useful because they introduce a dimension of temporality to the existing theoretical discourse and provide a frame of reference for identifying contingencies and boundary conditions that deepen our understanding of a phenomenon. Moreover, by identifying the IS capabilities that are crucial in each stage and relating them to some of the enablers of platform development in the existing literature, our study has revealed a possible sequence and some boundary conditions of those enablers. For example, our process model suggests that platform openness (Economides & Katsamakas, 2006b; Eisenmann et al., 2009) may be more important to

MSP development from the formative stage onwards, whereas the emphasis of the sponsor in the nascent stage should be on developing a compelling value proposition and attaining critical mass (Gawer & Cusumano, 2008). These propositions suggest that a more nuanced view of MSP development is necessary and provide some insights that could contribute towards the development of a contingency perspective of MSP development.

Lastly, this study also contributes to the research on IS capabilities. In particular, our study provides a dynamic and longitudinal perspective of the role of IS capabilities in the specific context of MSP development and suggests that certain categories of IS capabilities should come to the fore in different stages of MSP maturity. More specifically, our study suggests that the inside-out IS capabilities of IS infrastructure and IS technical skills (Wade & Hulland, 2004) should be emphasized in support of the coring and tipping platform strategies (Gawer & Cusumano, 2008) to establish a unique value proposition, an appropriate pricing structure (Bakos & Katsamakas, 2008; Rochet & Tirole, 2006), institution-based trust (Pavlou & Gefen, 2004), and market momentum (Eisenmann et al., 2006) in the nascent stage of MSP development. Conversely, the outside-in IS capability of external relationship management (Wade & Hulland, 2004) in support of the encapsulating and empowering strategies and the outside-out IS capability of platform IS leadership in support of the meshing and empowering strategies should be emphasized in the formative and mature stages of MSP development, respectively. This is because the former serves to mitigate the threat of envelopment (Eisenmann et al., 2006, 2011) and the risks of expansion (Hagiu, 2009), while the latter creates coherence (Boudreau & Hagiu, 2009) and fosters the motivation and ability for collective action (Iansiti & Levien, 2004a). These findings are particularly significant in that they reveal not only how IS capabilities can support effective MSP development but also how they should be selectively applied across the different stages of MSP maturity.

Moreover, our study introduces the notion of outside-out IS capabilities that currently falls beyond existing taxonomies of IS capabilities (see Wade & Hulland, 2004). This conceptual innovation is important because it hints at another possible perspective of how IS capabilities can be applied for organizational value beyond the two dominant perspectives of contemporary IS capabilities research (Piccoli & Ives, 2005). As we discuss earlier, the existing perspectives of how IS capabilities can be leveraged for organizational value tend to be aligned with either the RBV (e.g., Bhatt & Grover, 2005; Nevo & Wade, 2010) or an agility perspective (e.g., Overby et al., 2006; Sambamurthy et al., 2003). However, an alternative approach to strategy may be based on a logic of complexity (for a review, see Lengnick-Hall & Wolff, 1999) and the concept of outside-out IS capabilities could be a manifestation of this logic. Consequently, this paper can potentially serve as a catalyst for further research on this particular mechanism for value creation (i.e., an IS-enabled ecosystem strategy), and, by complementing the two dominant perspectives of IS capabilities, a more holistic and complete picture of the business value of IS capabilities may emerge.

6.2. Limitations and Future Research

This study is not without its limitations. A first limitation is that our research design is based on a single case study and, although studies based on single cases are a “typical and legitimate endeavor” (Lee & Baskerville, 2003, p. 231), a common criticism of the approach is the problem of generalizability (Walsham, 2006). While we readily acknowledge that generalization, in a statistical sense, is impossible with our research design, we contend that our study is generalizable beyond its singular context because the process model developed is not only grounded in the empirical reality of our case study but also corroborated by some of the most established works in the literature on MSPs and IS capabilities. As such, this study invokes the principles of “analytic generalization” (Yin, 2003, p. 32) or what Lee and Baskerville (2003, p. 235) refer to as “generalizing from description to theory”. Nevertheless, future research could statistically validate the propositions of our study so that the boundary conditions of the process model developed in this paper can be better defined.

A second limitation is that the focus of our study was restricted to the IS capabilities of the platform sponsor (i.e., Alibaba) because we expected them to have a direct and powerful influence (Eisenmann et al., 2006; Hagiu, 2009) on MSP development. However, a MSP consists of other peripheral entities, too (Gawer & Cusumano, 2008; Teece, 2007), and, although the effect may or may not be less direct, the collective and independent influence of the IS capabilities of these entities

on MSP development cannot be discounted. In addition, an MSP could certainly be configured differently (e.g., have no clearly defined or more than one sponsor). While it is certainly impossible to exhaustively account for the influence of all the IS capabilities of the various types of platform members in all possible forms of MSPs in a single case study, examining the influence of the IS capabilities of peripheral entities could be a fruitful avenue for future inquiry. Investigating the role of IS capabilities in MSPs that have a different configuration could yield important insights, too. While they fall beyond the scope of the present study, future studies in these areas would certainly provide a more complete picture of the role of IS capabilities in MSP development.

6.3. Implications for Practice

In terms of implications for practice, this study provides several important guidelines for developing and subsequently leveraging a contemporary IS-enabled MSP for current and aspiring platform sponsors. First, our process model presents a MSP development trajectory with successive stages of increasing sophistication. In addition, it explicitly identifies the IS capabilities that should be leveraged and includes examples of specific initiatives from one of the most commercially successful MSPs in the world across its development stages. In doing so, platform sponsors can use our process model to review their existing IS capabilities and plan for the acquisition or development of the appropriate capabilities if the need arises (i.e. if they do not currently possess those capabilities or if the existing capabilities are inadequate). Second, our study also highlights the platform development strategies that are particularly effective across the stages and provides explanations about how these strategies can be enabled by IS capabilities to influence MSP development. As such, platform sponsors may also be able to use our process model as a detailed roadmap and adopt the appropriate development goals and strategies depending on their platform's maturity.

Finally, our study also provides indications on the different organizational gains that can be derived from a MSP depending on how the platform is configured. More specifically, our study reveals how: 1) a hub-and-spoke MSP can enable a sponsor to better sense and respond to its members needs in the nascent stage, 2) a networked MSP can enable a sponsor to monitor interactions between members to anticipate future or unexpressed needs in the formative stage, and 3) a symbiotic MSP can enable a sponsor to marshal the resources of its members towards collective goals and the co-production of innovations in the mature stage. These indications should be especially useful for sponsors who face difficulties in leveraging their platforms for tangible gains (Eisenmann et al., 2006) because our process model can help in the identification of an appropriate mechanism for stimulating innovation and platform value creation (Dhanaraj & Parkhe, 2006). In doing so, we hope that these platform sponsors will be able to make the most of the efforts and resources invested in managing their MSPs and exploit their fullest potential.

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Appendices

Appendix A: Sample Interview Guide

Table A-1. Thematic Interview Guide for Interview with Alibaba B2B General Manager

Initial strategy of Alibaba's MSP:

- What was the reason for the founding of Alibaba?
- Why was the small and medium-sized enterprises (SME) market targeted specifically?
- What was the market situation at the time?
- Were there unmet needs in the market?
- How did Alibaba fulfill those needs?

Evolution of Alibaba's MSP:

- How did Alibaba evolve over the years?
- What were some of the key initiatives of Alibaba over the course of its history?
- What is rationale behind these initiatives?
- How did these initiatives contribute to the development of Alibaba?

Alibaba B2B's competitive environment:

- Who were Alibaba's main competitors at the time of its launch (both local and international)?
- How has the competition of Alibaba B2B evolved over the years?
- What is the value proposition of Alibaba B2B relative to its competitors?
- How has the market share of Alibaba grown over time in the B2B marketplace industry (in terms of local market share and global market share)?

Alibaba's platform development strategy:

- How did Alibaba attract buyers and sellers to its platform initially?
- How did Alibaba sustain the growth of its platform over the years?
- What were the different groups that joined and participated on the platform over the years?
- How did the strategies for promoting the growth of its platform evolve over time?
- How did the technological infrastructure of Alibaba influence the development of its platform over the years?

Features and services of Alibaba B2B:

- What are some of the unique features of Alibaba B2B compared to its competitors over the years?
- What are the services provided by Alibaba B2B and how have they evolved over time?
- What is the value of the various features and services of Alibaba B2B for the users?
- How did the features and services of Alibaba B2B contribute to the development of Alibaba's platform?

Revenue model of Alibaba B2B:

- What is the monetization strategy of Alibaba B2B at its inception?
- How has the monetization strategy of Alibaba B2B evolved over the years?
- How does the Gold Supplier scheme of Alibaba B2B work?

Appendix B: Summary of Data Collection

Table B-1. Primary and Secondary Sources of Data

Themes covered	Informants	Secondary data collected
Nascent stage (1999-2005): - Initial strategy of Alibaba's MSP - Alibaba B2B's competitive environment - Motivation for establishing Taobao and Alipay - Features and services of Alibaba B2B, Taobao and Alipay - Platform competition between Taobao and eBay	**Alibaba Group** - Alibaba B2B General Manager - Alipay Vice President (VP) of Strategy - Taobao VP of Customer Relations - Alibaba VP of Research and training **Merchants** - Alibaba B2B Gold Supplier - Alibaba B2B Seller A - Taobao Seller **Buyers** - Taobao User A - Taobao User B - Alibaba B2B User A **Analysts*** - Analyst A	**News articles** - *Alibaba Gives Investors First Taste of Micro Credits* (2013) (www. globalcapital.com) - *Why eBay Failed in China* (2013) (Website: psmag.com) - *How eBay Failed in China* (2010) (www.forbes.com) - *Alibaba Launches Business Software Company* (2007) (www.china.org.cn) - *Alibaba Group Launches Online Advertising Exchange Company Alimama* (2007) (www.ecommercebytes.com) - *Alibaba Buys Koubei.com* (2006) (www.venturedata.org) - *Alibaba acquires Yahoo China* (2005) (www.chinadaily.com.cn) **Books** - *Alibaba's Yun Ma's Knack for Doing Business* (2012) (Published by China Pictorial Publishing House) - *Ma Yun: This is the Way I Manage Alibaba* (2012) (Published by Shanxi Peoples Publishing House) - *Biography of Ma Yun* (2011) (Published by Zhejiang Publishing United Group) - *Ma Yun and Alibaba* (2011) (Published by Modern Press) - *The Inside Story Behind Jack Ma and the Creation of the World's Biggest Online Marketplace* (2009) (Published by Harper Business) - *The Official Alibaba.com Success Guide* (2009) (Published by Wiley) **Internal Publications** - *Ascend* (2012) (Annual Report FY2011) - *The Future is Bright with Alibaba* (2011) (Annual Report FY2010) - *Grown by You* (2010) (Annual Report FY2009) - *Global Trade Starts Here* (2009) (Annual Report FY2008)
Formative Stage (2005-2006): - Motivation of acquiring Yahoo and Koubei - Business objectives of Yahoo and Koubei - Features and services of Yahoo and Koubei - Implications of the acquisitions for Alibaba's MSP and platform development strategy	**Alibaba Group** - Alibaba B2B General Manager - Alibaba VP of Research and training - Yahoo Koubei Customer Relations Manager **Buyers** - Taobao User C - Alibaba B2B User B - Yahoo Koubei User A - Yahoo Koubei User B **Analysts*** - Analyst A - Analyst B	

Table B-1. Primary and Secondary Sources of Data (cont).

Themes covered	Informants	Secondary data collected
Mature stage (2007-Present) - Motivation for establishing Alimama, Alisoft and Aliloan - Business objectives of Alimama, Alisoft and Aliloan - Features and services of Alimama, Alisoft and Aliloan - Implications of Alimama, Alisoft and Aliloan for Alibaba's MSP and platform development strategy	**Alibaba Group** - Alibaba B2B General Manager - Taobao VP of Customer Relations - Alimama Senior Manager - Alisoft Executive VP - Alibaba VP of Operations **Merchants** - Alibaba B2B Seller B - Taobao 5 Star Seller A - Taobao 5 Star Seller B **Advertisers** - Alimama User A - Alimama User B **Buyers** - Taobao User D - Alibaba B2B User C - Alisoft User A - Alisoft User B **Analysts*** - Analyst A - Analyst B	**Corporate website articles** - *Alibaba Group Launches Online Advertising Exchange Company Alimama* (2007) (Press Release) - *Alibaba Group Makes Strategic Investment in Koubei.com* (2006) (Press Release) - *Yahoo China Launches Specialized Search Functions* (2006) (Press Release) - *Alibaba.com Launches Online Payment Solution in China* (2005) (Press Release) - *Yahoo! and Alibaba.com form Strategic Partnership in China* (2005) (Press Release) - *Alibaba.com Brings Trust to Online B2B Commerce for SMEs* (2001) (Press Release)

*Analysts are past and present power users of Alibaba's platform that have taken on a coaching and commentary role. They serve to review, critique, and develop tutorials on the features and services provided by Alibaba and provide opinion leadership on innovations and future directions.

Appendix C: Summary of Data Analysis

Table C-1. Coding Techniques Used in Data Analysis

Coding type	Purpose
Factual coding (Major & Savin-Baden, 2010)	To identify key events that have occurred and the initiatives enacted (e.g., launch of Alipay and Alimama, acquisition of Yahoo China and Koubei). We triangulated information from the interviews against secondary sources such as news articles, books, internal publications, and information from the corporate website.
Open coding (Strauss & Corbin, 1998)	To identify theoretical dimensions, suggested by the case data, which have not been anticipated a priori. An example is the inclusion of a form of IS capabilities we termed "outside-out" IS capabilities. Alibaba's initiatives in the mature stage of its platform development, in particular, relate to externally-oriented IS capabilities that are deployed and reside outside the firm. Because this falls beyond the existing taxonomies of IS capabilities (Wade & Hulland, 2004), we used open coding, in which several passes were made through the data to identify the relevant pieces of information, to flesh out the construct and relate it to our emergent theory.
Axial coding (Strauss & Corbin, 1998)	To identify second-order themes, suggested by the case data, which have not been anticipated a priori. Examples include the delegating, encapsulating, meshing, and empowering platform development strategies of Alibaba in the formative and mature stages. These are sub-themes are related to the "enablers of platform development" theme of the initial theoretical lens (refer to Table 4).
Selective coding (Strauss & Corbin, 1998)	To relate our empirical findings to the theoretical dimensions and second-order themes identified in the existing literature as captured in our initial theoretical lens or emergent theory. Examples include data relevant to the capabilities of market responsiveness, IS planning, IS-strategy alignment, external relationship management, IS infrastructure and IS technical skills, which have been identified in previous taxonomies of IS capabilities (Wade & Hulland, 2004).

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