

NURTURING AND LEVERAGING VIRTUAL COMMUNITIES: A TWO-DIMENSIONAL PROCESS MODEL

Completed Research Paper

Barney Tan
University of Sydney
H69 Economics and Business Building
Corner Rose and Codrington Streets
University of Sydney, NSW 2006
Australia
barney.tan@sydney.edu.au

Felix Ter Chian Tan
University of New South Wales
West Wing 2nd Floor
Kensington Campus
UNSW, NSW 2052
Australia
f.tan@unsw.edu.au

Abstract

Despite the optimism surrounding the business potential of virtual communities (VCs), our knowledge of how VCs can be nurtured and leveraged to create value for the organizations that sponsor them is limited. To address this knowledge gap, a two-dimensional process model of the development and leverage of a VC is inductively derived from a case study of one of the most commercially successful VCs in Singapore. The model suggests that different IT competencies drive the development of various VC-enabled capabilities in different stages of VC maturity. Moreover, as the VC becomes increasingly mature, the number of ways in which it can be leveraged for organizational value creation increases. With its findings, this study sheds light on the key mechanisms of VC-enabled organizational value creation, and provides a comprehensive and empirically grounded framework for practitioners to analyze and optimize their investments in VCs.

Keywords: Virtual community, value creation, case study

Introduction

Virtual communities (VCs) are defined as social aggregations of dispersed individuals that might not be known or identifiable, formed through computer-mediated communications on the Internet (Faraj et al. 2011; Rothaermel and Sugiyama 2001). Since the advent of the Internet in the mid 1990s (see, e.g. Armstrong and Hagel 1996), VCs have been widely predicted to bring about strategic outcomes for the firms that sponsor them (Dahlander and Frederiksen 2011; Ma and Agarwal 2007). Yet, despite the extraordinary success of a select few (see, e.g. Blanchard and Markus 2004; Mohammed et al. 2004), most VCs have, in fact, failed to deliver any form of benefits for their sponsoring organizations (Porter and Donthu 2008; Sangwan 2005). The inability of the majority of practitioners to translate their investments in VCs into tangible gains suggests an inadequate understanding of how VCs may be nurtured and leveraged to create value for the sponsoring organization (Balasubramanian and Mahajan 2001; Porter and Donthu 2008). This lack of knowledge, in turn, may stem from a number of gaps in the literature.

First, a significant proportion of existing studies on the leverage of VCs has focused on explaining the value of VCs for members (e.g. Gu et al. 2007; Wang and Ramiller 2009) instead of *“how firms might leverage such communities to create value for themselves”* (Porter and Donthu 2008, p. 113). Consequently, much of the existing knowledge on VC value is centered on their value for community participants at the individual or group level. Conversely, little is known about VC-enabled organizational value creation, defined as the identifiable and measurable economic benefits gained by a firm as a consequence of sponsoring a VC (Burke and Logsdon 1996). Second, of the handful of studies in the literature that delves into the underlying mechanisms of VC-enabled organizational value creation, most of them are conceptual in nature (e.g. Balasubramanian and Mahajan 2001; Lee et al. 2005b) with no empirical evidence offered to substantiate their propositions (Porter and Donthu 2008). While these conceptual papers certainly offer plenty of food for thought for practitioners that manage VCs, there is a pressing need for empirically validated theories if the state of knowledge on how VCs can be developed and leveraged for organizational value is to be advanced.

Using a case study of M.com (a pseudonym), an IT publications firm that runs one of the largest and most commercially successful VCs in Singapore, the overarching purpose of this study is to contribute to the understanding of how VCs can be nurtured and leveraged to create value for their sponsoring organizations. VCs have the potential to bring about immense rewards for the organizations that sponsor them: the multi-billion dollar VC-driven successes of organizations such as iVillage, AOL and Yahoo attest to this (see, e.g. Preece 2001; Walden 2000). Yet, as the account of Intel's US\$1 billion chip recall illustrate (e.g. Walden 2000), VCs can bring about calamitous consequences as well. Given the *‘double-edged’* nature of VCs, the knowledge that this study aims to contribute towards is crucial if the full economic potential of nurturing a VC is to be realized, and if the potential pitfalls are to be avoided. More specifically, in an attempt to contribute to the two gaps in prior VC research highlighted earlier, the objective of this study is to present a coherent theoretical framework grounded in the empirical reality of a real world organization (i.e. Gap 2), which describes and explains the process of VC-enabled organizational value creation (i.e. Gap 1). Beyond its academic significance, the findings of our study may also serve as a useful reference for practitioners on how to maximize the returns from their investments in VCs. Corresponding to the purpose of our study, the research questions that we aim to address are: (1) How does an organization develop and nurture a VC? and (2) How can a VC be leveraged to create value for the sponsoring organization?

Literature Review

Virtual Communities

The advent of Internet technologies facilitated the creation of the first VCs by enabling synchronous communications and interactions that transcend the physical limits of time and space (Sangwan 2005). Although VCs may be differentiated according to their purpose (Armstrong and Hagel 1996), social structure (Kozinets 2002), physical features (Preece 2001), and organization (Porter 2004), there are a number of characteristics that are common across most VCs (Porter and Donthu 2008). In particular, VCs

are social aggregations (Rheingold 1993) based on common interest (Faraj et al. 2011), and comprises of members that engage in frequent interactions (Balasubramanian and Mahajan 2001), generate communal information and resources (Gu et al. 2007), demonstrate reciprocity (Preece 2001), and share cultural norms, moral standards and governing policies (Kozinets 2002). The earliest VCs were self-organizing and socially-oriented, centered on the personal, non-professional relationships between VC members (Kannan et al. 2000). It was not until the mid 1990s when the idea was first raised that VCs can be used as a powerful business tool to tap into the collective intelligence of employees and customers; transforming the basis of competition to create competitive advantage and organizational value for the organizations that sponsor them (Armstrong and Hagel 1996).

The purported benefits of sponsoring a VC include enhancing access to customer opinions, increasing sales, lowering the costs of customer service, enhancing customer loyalty, generating positive word of mouth and creating additional sources of revenue (Armstrong and Hagel 1996; Dholakia et al. 2004; Kozinets 2002; Shang et al. 2006). Yet, despite the enthusiastic prognostications of its business potential, the reality is that most commercial VCs have failed to bring about any form of economic benefits for the organizations that sponsor them (Balasubramanian and Mahajan 2001; Sangwan 2005). More recent studies have attributed the inability of the majority of practitioners to translate their investments in VCs into tangible gains to a lack of knowledge on the process of VC-enabled organizational value creation, or more specifically, how VCs may be nurtured and leveraged to create value for the sponsoring organization (Porter and Donthu 2008). A review of the existing literature on VCs reveals two important gaps that may account for this lack of knowledge.

First, the majority of the existing studies on the leverage of VCs has focused on their value to individuals or groups as opposed to the organizations that sponsor them (Porter and Donthu 2008). For example, to unlock the value of VCs for individuals and groups, the means that have been proposed in the literature include promoting consumer-sponsor identification (Bhattacharya and Sen 2003), managing the tensions caused by the fluidity of resources (Faraj et al. 2011), increasing the quantity and quality of postings (Gu et al. 2007), cultivating trust (Porter and Donthu 2008) and promoting different modes of learning (Wang and Ramiller 2009). Conversely, there is a lack of attention on the underlying mechanisms for VC-enabled organizational value creation. This may be due to the inherent multi-dimensional complexities of both the VC and the organization (de Moor and Weigand 2007), which makes it difficult to attribute organizational gains to the specific act of sponsoring a VC (Lee et al. 2005b).

Second, of the handful of works on VC-enabled organizational value creation, most of them are conceptual in nature and not supported by empirical evidence (with the exception of Shankar and Bayus 2003, that focuses exclusively on network effects in VCs). To illustrate, the means for VC-enabled organizational value creation that have been proposed include “*economic on social grafting*” (Balasubramanian and Mahajan 2001, p. 128), ensuring fit between the VC and the marketing strategy (Kozinets 1999) or business model (Lee et al. 2005b) of the community sponsor, and an appropriate mode of community control (Walden 2000). However, we did not identify any confirmatory studies that have empirically validated the propositions of these papers. Without empirical support, future studies that build on these works can only remain in the realm of guesswork and assumptions, from which it is difficult to derive concrete theories and principles for the advancement of knowledge in this area.

To address these gaps in the literature, we adopt as a theoretical lens Sambamurthy et al.’s (2003) framework of Information Technology (IT) enabled organizational value creation of to structure our inquiry. Since its introduction, the framework has been applied to guide both qualitative and quantitative studies on the business value of IT in the areas of e-commerce (Tan et al. 2009; Zhu and Kraemer 2003), supply chain management (Rai et al. 2006), customer relationship management (Ray et al. 2005), new product development (Pavlou and El Sawy 2006), and knowledge management (Garud and Kumaraswamy 2005). The repeated application and, in some instances, validation of the framework in business value of IT research across a range of contexts makes it an appropriate and robust theory for guiding our inquiry since we are essentially examining the business value of VCs for community sponsors.

IT-Enabled Organizational Value Creation

The IT-enabled organizational value creation framework of Sambamurthy et al. (2003) may be viewed as an extension of the literature on IT capabilities (e.g. Bharadwaj 2000). The traditional perspective of IT

capabilities draws on the classic proposition of the RBV and holds that certain IT capabilities may either be the means to sustainable competitive advantage in themselves (e.g. Bhatt and Grover 2005; Santhanam and Hartono 2003), or they may be strategic necessities (Powell and Dent-Micallef 1997) that can be combined with complementary organizational capabilities to this end (e.g. Ravichandran and Lertwongsatien 2005). However, reflecting the increasing skepticism about the possibility of sustaining competitive advantages over time (Sirmon et al. 2007) and the growing consensus that IT has become a commodity in its pervasiveness and widespread availability (Carr 2003), Sambamurthy et al.'s framework have instead emphasized the role of IT capabilities 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) to create a series of temporary competitive advantages over time (Eisenhardt and Sull 2001).

Building on strategic management, entrepreneurship and IT management literatures, Sambamurthy et al.'s framework (2003) identifies three organizational capabilities (IT competence, enterprise agility and digital options) and two strategic processes (capability-building and entrepreneurial action) as the key antecedents and mechanisms of IT-enabled organizational value creation (For definitions of the key concepts used in the framework, see Sambamurthy et al. 2003) . According to the framework, the process of creating value through the leverage of IT begins with the strategic process of capability-building in which IT competence is transformed into digital options through new investments in IT and an intricate blend of IT, organizational knowledge and business processes (Barua and Mukhopadhyay 2000). There are four types of digital options, each with its own characteristics and function: digitized process reach, digitized process richness, digitized knowledge reach, and digitized knowledge richness. As the process of IT-enabled organizational value creation unfolds, Sambamurthy et al.'s framework describes how digital options are, in turn, translated to enterprise agility in the next phase of capability-building (Sambamurthy et al. 2003). Enterprise agility can take three forms: (1) Customer agility; related to a firm's ability to sense and respond to its customers needs, (2) partnering agility; related a firm's to build a networks of strategic partnerships for innovation and collective action, and (3) operational agility; related to a firm's ability to rapidly redesign and reconfigure existing processes or create new ones to exploit dynamic environmental conditions.

Following the capability-building process, Sambamurthy et al.'s framework depicts the strategic process of entrepreneurial action through which enterprise agility is leveraged to create organizational value. The underlying rationale behind entrepreneurial action is that firms with strong connections with their customers (i.e. customer agility) and business partners (i.e. partnering agility), and which are able to reconfigure their existing business processes rapidly (i.e. operational agility) will be better able to launch a wider and more complex repertoire of competitive actions. The increased range and complexity, in turn, creates value for the focal organization as it is able to generate new value-creating resource configurations to create a series of temporary competitive advantages (Eisenhardt and Martin 2000). Moreover, the focal organization would be able to adopt creative, radical or unconventional means to aggressively disrupt the competitive equilibrium (Eisenhardt and Sull 2001) to keep its competitors off-balance (D'Aveni 1994). In particular, of the three dominant logics of strategy that have been identified in contemporary strategic management research (For a review of the three dominant logics, see Sambamurthy et al. 2003), the process of entrepreneurial action is aligned with the logic of opportunity that emphasizes continuous innovation. This is because amidst the dynamic and turbulent operating conditions of the contemporary business landscape (McAfee and Brynjolfsson 2008; Sull 2009), Sambamurthy et al. argue that the leverage of IT for organizational value creation *“must embrace the logic of opportunity and be targeted at seizing series of competitive advantages”* (Sambamurthy et al. 2003, p. 241). In comparison, the traditional perspective, in which IT capabilities are perceived the means to sustainable competitive advantage in themselves (Bhatt and Grover 2005) or in combination with other capabilities (Ravichandran and Lertwongsatien 2005), is more aligned with what is termed the logic of leverage.

In their article, Sambamurthy et al. (2003) also describes a strategic process of co-evolutionary adaptation through which the organizational value gained from the firm's competitive actions enhances enterprise agility, and subsequently, digital options in a mechanism of feedback. However, as the scope of our study is limited to how VC-enabled capabilities may be developed and leveraged for organizational value creation, we have omitted the process of co-evolutionary adaptation; which deals with the reverse mechanisms of our phenomenon of interest. This is to preserve the simplicity and parsimony of our theoretical lens.

Research Method

We adopted the case research method for our study. Case research is particularly appropriate for the purpose of this study as we are interested in *how* VCs can be nurtured and leveraged (Walsham 1995). In addition, a commercial VC run by a for-profit organization comprises of a social, a technological and a business dimension (de Moor and Weigand 2007). Therefore, the inherent multi-dimensional complexity of the phenomenon makes it difficult to understand objectively, making it more appropriate to examine the phenomenon by interpreting the shared understanding of the relevant stakeholders (Klein and Myers 1999).

M.com was selected as the case organization of our study. The rationale for case selection is that its community represents the largest and most commercially viable VC in Singapore that transformed M.com from a small e-commerce startup operating in the IT publications industry to the most visited website in the country. More relevant to our research purpose, M.com had also enacted a variety of initiatives to promote the development of their VC, which was subsequently used to facilitate a number of strategic outcomes. The variety in both the initiatives enacted and the outcomes achieved is ideal as it could potentially shed light on the contingencies surrounding the mechanisms of interest, and enable us to identify wider array of possibilities for nurturing and leveraging VCs. This would enhance the sophistication of our theorizing, resulting in a richer and more nuanced theory overall.

A total of 24 interviews were conducted with key members of M.com's management, staff, and VC in three rounds of data collection that spanned from 2006 to 2012. The longitudinal nature of the study facilitated both a comprehensive study of past events, activities and decisions, as well as an opportunity to directly observe existing practices, strategy formulation and execution within the organization over an extended period of time. The interviews were conducted with semi-structured interview guides that were designed based on a number of themes and subthemes. These were derived from the key concepts presented in our theoretical lens (i.e. Sambamurthy et al. 2003), which include the various forms of IT competencies, digital options, agility, competitive actions, and strategic logics that form the basis of IT-enabled organizational value creation (see Table 1). This approach to case research is less rigid (Ferlie et al. 2005) than an explanatory case study that simply seeks to validate pre-formulated hypotheses (Yin 2003), but balances the generative nature of pure induction with the pragmatism of early structure (Langley 1999). The interviews, which took an average of 60 minutes, were all digitally recorded and later transcribed for data analysis. Data from the interviews was supplemented by newspaper articles, books, internal publications, and information from the corporate website. Notes from direct observation were also used to corroborate the data obtained.

Table 1: Themes and Subthemes of our Theoretical Lens

Themes	Subthemes
IT Competencies	IT capabilities, investment scale
Digital Options	Process reach, process richness, knowledge reach, knowledge richness
Agility	Customer agility, partnering agility, operational agility
Competitive actions	Number of actions, complexity of action repertoire
Strategic logics	Positioning, leverage, opportunity
Value creation	IT competence → digital options, digital options → agility, agility → competitive actions

Data analysis was performed concurrently with data collection to take advantage of the flexibility that the case research method affords (Eisenhardt 1989). From our initial interviews, we realized that evolution of M.com's VC followed the stages of a typical VC development lifecycle (see Lee et al. 2005a; Mohammed et al. 2004) and the development and leverage of M.com's VC appeared to have been enacted differently in each stage. Consequently, we adopted a temporal bracketing strategy (Langley 1999) and divided the events, activities and decisions that transpired at M.com into the three stages of the lifecycle. The purpose of the temporal bracketing strategy was to create a logical structure and a frame of reference to organize the subsequent data collected.

We then coded the data collected according to the themes of our theoretical lens (see Table 1) using a mix

of open, axial and selective coding (Strauss and Corbin 1998) after each subsequent interview. In particular, if an emergent piece of data is closely aligned with an existing subtheme, we used selective coding to associate the piece of data to the conceptual category. On the other hand, if the emergent piece challenged an existing theme or subtheme, we would modify the schema with either open or axial coding respectively (Walsham 2006). Each new finding was verified to ensure that it was supported by at least two sources of data (Klein and Myers 1999), and coding would be restarted whenever new conceptual categories were added, modified or deleted (further details will be presented in our results section). By “*recursively iterating between (and thus constantly comparing) theory and data*” (Eisenhardt and Graebner 2007, p. 30) in this way, our theory was inductively derived and gradually shaped.

At various points in the process of data analysis where changes to the emergent theory were particularly significant, we would use the narrative and visual mapping strategies (Langley 1999) to summarize and validate our findings. The narrative strategy entailed the construction of a ‘*story*’ that represented our account of what happened. The visual mapping strategy, on the other hand, involved creating chronological event timelines and documenting the emergent theory in a series of diagrammatic sketches. After the narrative and the visual maps have been constructed, they were verified with the relevant informants. This was to ensure the validity of both our interpretation of the events, activities and decisions that have unfolded, as well as our theoretical ideas (Pan and Tan 2011). This process continued until the state of theoretical saturation is reached (Glaser and Strauss 1967). Theoretical saturation 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).

Findings

The Nascent Stage (Mid 1998 – Late 1999)

M.com originated from a special interest group (SIG) hosted on an online portal sponsored by the Singapore government. The SIG catered primarily to the needs of a niche community of CPU overclockers, allowing members to post their hardware configurations and overclocking results on an electronic bulletin board. Although the community it served was relatively small, the SIG generated such heavy web traffic that it throttled its parent website by taking up 90% of its total bandwidth within a month of its inception. Unable to cope with the traffic that the SIG was generating, the group was eventually dissolved by the management of the portal. Seeking a new home, the organizers of the SIG applied for, and were awarded, a US\$13,000 grant from the Singapore government. This seed funding, in tandem with the US\$650 contributed by the organizers of the SIG, provided the means for the establishment of M.com and its VC.

When the VC was first formed, M.com’s efforts in promoting the development of its VC were centered on a number of initiatives. First, it acquired a dedicated web server, adequate bandwidth, and an off-the-shelf electronic discussion board application to provide the means for its members to communicate and interact. Second, it established its own hardware testing laboratories to generate content that would then be posted on their discussion forum. This served to enhance the value of the VC for its members and make up for the lack of breadth and depth in member-contributed content at the time. Third, the founders of M.com sought to enhance the interactivity within its VC by responding personally to new posts quickly and recruiting community leaders that were willing to do the same. As these initiatives were essentially IT capabilities (Wade and Hulland 2004), based on the existing literature, we labeled these capabilities as ‘*providing infrastructure*’, ‘*managing content*’, and ‘*enhancing interactivity*’ respectively. The definition of these constructs and illustrative data from the case study are presented in Table 2.

By providing the IT infrastructure necessary for its VC to function, and managing content and enhancing interactivity to increase the value and liveliness of its VC, M.com was able to attract and retain its first members. The ‘*nascent stage*’ of the VC development lifecycle refers to the earliest stage of VC development where the VC is small and dominated by the community founders and a core group of early adopters (Mohammed et al. 2004). Accordingly, we labeled this initial phase of VC development at M.com as the nascent stage as these traits matched the state of M.com’s VC at this point in time. VC Member C, a member of M.com’s VC from the very beginning, provided an illustrative quote: “*In the beginning, we didn’t have many members... it was mainly them (M.com’s founders) and the group of hardcore*

“techies” who came over from the previous (community)”

Table 2: Enabling IT Competencies in the Nascent Stage	
IT Competencies	Representative Quotes
Providing infrastructure: Sponsor's IT assets that includes hardware, software and networking technologies (Bharadwaj 2000)	<i>“For the VC (to function), you need a server, you need the software, and you need sufficient bandwidth... We could only afford 6 months of bandwidth at the time. If we didn't take off, it was all over.” – M.com Co-Founder</i>
Managing content: Sponsor's ability to provide and maintain quality content that are relevant and of interest to the VC members (Porter and Donthu 2008)	<i>“When (M.com's VC) first started, the quality of the (member contributed) content was a problem... There was not much (content) to begin with... and (the content) was lacking in depth and breadth... I would say that most of the product reviews, news and articles came from (M.com's founders) at the time” – VC Member C</i>
Enhancing interactivity: Sponsor's ability to stimulate and sustain communications and interactions within the VC (Dholakia et al. 2004)	<i>“We were trying to make our forum very responsive... and increase the amount of interactions going on... so we were on the forum all the time... you could see that whenever someone posted something, within 20 minutes, one of us (M.com's founders) would reply” – M.com Co-Founder</i>

More importantly, the capability of digitized knowledge richness is developed as the VC is now able to serve as a platform for interactions between M.com and its members (see definition of digitized knowledge richness in Sambamurthy et al. 2003). It is this VC-enabled capability that M.com leveraged for organizational value creation during this stage of VC development. At the point of M.com's market entry, the Singapore IT publications industry was in a state of market saturation with numerous foreign and local titles available both in print and online. However, feedback from the VC enabled the founders of M.com to realize that there remained an unmet need in the saturated market. One of M.com's founders described this critical insight: *“Based on the feedback we were getting (from the VC members), we realized that the foreign publications do not meet their needs because the content is not meant for the local audience. For example, the products reviewed in these publications are often unavailable locally, the prices may be outdated or listed in US dollars. And the main problem with the local IT publications is that although their contents are localized, they are usually not comprehensive because they lacked funding, which comes with credibility and market reach... and then you have your tradition source of information - the printed magazines. But of course, these magazines cost money...”*

Based on this revelation, M.com moved quickly to exploit the opportunity by positioning themselves as a comprehensive provider of free, localized IT content. They made the decision to provide their content for free and depend solely on online advertising to achieve a cost advantage over printed magazines. In addition, they formed strategic alliances with a number of local IT vendors who would send them their pricelists and products to review exclusively. This served to ensure that their content was more comprehensive than the local publications, as well as more relevant and up to date in comparison to the foreign publications. In other words, the “*system of interaction*” (Sambamurthy et al. 2003, p. 249) that is digitized knowledge richness has facilitated the logic of positioning (Eisenhardt and Sull 2001; Tan et al. 2010) by helping M.com identify and occupy an attractive market position. This in turn, resulted in the creation of organizational value as M.com was able to create a value proposition that was dissimilar from the existing market offerings.

The Formative Stage (Early 2000 – Late 2004)

As M.com's VC began to grow, the management of M.com began to realize the importance of strengthening and maintaining relationships within the rapidly growing community to enhance the “*stickiness*” of its VC. Consequently, M.com began to undertake measures aimed at cultivating a sense of belonging (Lin 2008) and developing a complementary offline presence (Koh and Kim 2003; Rothaermel and Sugiyama 2001). For instance, M.com's management took active steps to acquaint themselves with the leaders and power users within their VC by organizing social events like gatherings and barbecues. They also invited them to M.com's offices and offered them gifts in the form of M.com related merchandise. In addition, they set up a shop that sold iced tea-based beverages at one of Singapore's largest IT mall with the aim of creating a physical space for their members to meet up and interact. As

these measures were manifestations of an “outside-in” IT capability aimed at “creating durable customer relationships” (Wade and Hulland 2004, p. 111), based on the existing VC literature, we termed this capability *fostering embeddedness*. The definition of this capability and illustrative data from the case study are presented in Table 3.

IT Competence	Representative Quotes
Fostering embeddedness: Sponsor’s ability to enhance member-sponsor identification (Bhattacharya and Sen 2003) and ingrain economic actions within the social processes of the VC (Balasubramanian and Mahajan 2001)	<p>“We (M.com’s top management)... organized outings and barbecues to get to know our members better... We invited key forum contributors and opinion leaders down to the office for tea and we gave them freebies such as T-shirts... If they (VC members) feel a sense of belonging, they will keep coming back.” M.com Co-Founder</p> <p>“They opened a bubble tea outlet (located at one of Singapore’s largest IT mall)... to allow (VC members) to gather and chill out before they do their shopping...” VC Member F</p>

By fostering embeddedness, M.com was able to further increase participation and enhance its relationship with the members of its growing VC to arrive at the next stage of VC development: the *formative stage*. The formative stage of the VC development lifecycle refers to the second stage of VC development and is characterized by a growing number of participants, a disproportionate member-to-administrator ratio, and a marked increase in the diversity and richness of the community dialogue (Mohammed et al. 2004). Accordingly, we labeled the phase of M.com’s VC development from early 2000 as the formative stage as these traits were aligned with the state of M.com’s VC during this period. VC Member B, who was a member of M.com’s VC at the time, provided an illustrative quote: “The community grew very quickly... There are more spontaneous (member-initiated) conversations going on because there are now a lot more members than admins... Although most of the topics were still centered on IT, people started talking about things like (PC) gaming, (gaming) consoles... and mobile phones...”

More significantly, fostering embeddedness precipitated the formation of two VC-enabled capabilities. First, the capability of digitized knowledge reach is developed as the increased participation led to the sharing and accumulation of information, which increases the “comprehensiveness and accessibility of codified knowledge” (Sambamurthy et al. 2003, p. 249) within the VC. Second, a capability that we term *directed community action* is developed as the enhanced relationship with its members increased the members’ willingness to commit resources, abilities and ideas towards M.com’s cause. Directed community action is defined as the ability of the sponsoring organization to channel the collective resources of the VC into actions and behaviors that further its own objectives. In tandem, these VC-enabled capabilities provided the means for organizational value creation that proved crucial to the survival of M.com when the conditions in the IT publications industry took a dramatic turn.

The advent of the dotcom crisis in 2000 created an adverse economic climate that plunged the Singapore IT publications industry into a period of great turmoil and uncertainty. As M.com was a *pure play* dotcom that depended solely on online advertising for revenue at the time, the effects of the dotcom crisis on M.com were particularly severe. In addition, with the phenomenal success of M.com, new competitors that sought to imitate M.com’s e-business model were emerging in the industry. Particularly troubling to the M.com management was the news that several local IT vendors, some of whom used to be M.com’s partners in the past, were now eying its lucrative business. Faced with new challenges, the management of M.com realized that the rules of competition in the Singaporean IT publications industry had fundamentally changed, and that M.com’s dependency on online advertising as its sole revenue stream made the organization susceptible to any form of turbulence that affected that particular source of income. Based on these insights, M.com leveraged the newly developed capabilities of digitized knowledge reach and directed community action to create organizational value through two strategic mechanisms.

First, digitized knowledge reach was leveraged to defend M.com’s market position from competitive imitation (Porter 2001) in line with the logic of positioning (Eisenhardt and Sull 2001; Tan et al. 2010). More specifically, the enhanced comprehensiveness and accessibility of information (Sambamurthy et al. 2003) that developed over time had enhanced the value of the VC for the community members, which made it more difficult for existing and potential competitors seeking to imitate the market position of

M.com (Porter 1996). Second, directed community action enabled M.com to mobilize its members in the co-development of a series of innovations that included (1) a printed IT magazine, (2) a PC gaming website, (3) a digital photography magazine, and (4) country-specific versions of its website. This is in line with the logic of opportunity in that it is a manifestation of an extreme form of customer agility (Sambamurthy et al. 2003): there is no need to “sense” (Overby et al. 2006, p. 120) customer demands nor devote resources to the development of innovations to meet those demands because the members are creating the innovations that they want for themselves (Lengnick-Hall 1996). Overall, the leverage of the two VC-enabled capabilities resulted in the creation of new streams of revenue that brought about financial stability to the organization. The evidence from our case study that supports these findings are presented in Table 4.

VC-enabled Capabilities	Underlying Logic	Representative Quotes
Digitized knowledge reach	Logic of positioning	<i>“As the community grew, the knowledge base accumulates... (which) makes it very hard for our competitors to go after our market (demand for local IT content)... Because we are in the business of providing information, to be able to compete with us, their content will at least have to be as good as ours... and that takes time...” - M.com Product Manager</i>
Directed community action	Logic of opportunity	<i>“A group of us (VC members), we came together and developed the entire (PC gaming) website from scratch without the management’s knowledge... We only presented the website to the management when we were done. Luckily, the CEO liked our idea and gave us the go ahead...” - VC Member C</i>

The Maturity Stage (Early 2005 - Present)

By early 2005, official membership figures of M.com’s VC had hit 200,000. With the growing realization that it was becoming both unfeasible and unnecessary to manage and control the VC directly, the management of M.com began to adopt measures aimed at formalizing leadership roles (Aksulu and Wade 2010; Koh and Kim 2003) and enabling community-directed rules, norms and dialogue within the VC (Jarvenpaa and Majchrzak 2010). For instance, M.com awarded recognized opinion leaders with administrative rights to the VC while power users were granted moderator privileges. In addition, members were empowered to suggest new discussion forums by voting, and establish their own rules and guidelines for community behavior (e.g. rules established include no ‘flaming’, no swearing, no advertising, etc.). Once again, as these measures are related to the outside-in IT capability of external (i.e. VC members) relationship management (Wade and Hulland 2004), based on the existing VC literature, we label this capability ‘granting autonomy’. The definition of this capability and illustrative data from the case study are presented in Table 5.

By granting autonomy, M.com was able to promote self-organization (Ghazawneh and Henfridsson 2010) and community control (Walden 2000). This enhanced the ease of management and scalability of M.com’s VC (Rothaermel and Sugiyama 2001) that enabled the attainment of the ‘maturity stage’ of VC development. The maturity stage of the VC development lifecycle is typically portrayed as the pinnacle of VC maturity and is characterized by the attainment of self-sustaining critical mass (Hagel and Armstrong 1997; Wellman et al. 1996). There is typically also a further step-shift increase in the diversity of the community dialogue, which would be reflected in the emergence of a number of member-initiated main topics that extends into a kaleidoscopic array of subtopics (Mohammed et al. 2004). Accordingly, we labeled the phase of VC development that began from early 20005 as the maturity stage as these traits described the state of M.com’s VC well. M.com’s Chief Content Officer, also one of the earliest members of M.com’s VC and privy to a first-hand perspective of the development of the VC over the years, provided an illustrative quote: *“At this point in time, the community was more or less self-organizing... (and) self-sustaining in that we (M.com’s management) don’t have to actively tend to the growth of the community... The topics that they were discussing on the forum grew more and more diverse... our most active section is (the lifestyle section) where people can talk about anything under the sun... we also have sections for... fitness... music, food... education...we even have a section for pets”*

Table 5: Enabling IT Competence in the Maturity Stage

IT Competence	Representative Quotes
Granting Autonomy: Sponsor's willingness and ability to institute an appropriate governance structure that strikes a balance between autonomy and community control (Ghazawneh and Henfridsson 2010)	<i>"I think at this stage (of VC development), the VC has become too big for the management to control (directly)... (In the end,) many of (the opinion leaders) in the forums were given administrative rights... users who contribute to the forum a lot were granted moderator privileges... members were allowed to vote on new sections and topics that they would like to see on the forum... we were empowered to establish our own rules and etiquette..." – M.com Forum Moderator</i>

For M.com, the attainment of critical mass transformed its VC into a strategic resource (see Barney 1991) that they could leverage for competitive advantage (Hagel and Armstrong 1997). Critical mass was thus a newly-developed VC-enabled capability for M.com that provided a new mechanism for organizational value creation as the Singapore IT publications industry returned to a state of normalcy. By 2005, the recovery of key industry parameters such as the rates of organizational mortality and the levels of online advertising signaled the end of the dotcom crisis. Following the shakeup in the industry, M.com had emerged as the dominant market leader, but with the realization that further investments in developing the present market would likely lead to diminishing returns, the management of M.com began looking to diversify into other industries that offered opportunities for replicating its successful business model.

Combining critical mass with the capability of digitized knowledge richness developed in the nascent phase (i.e. platform for interactions), M.com was able to create a representative profile of their VC members to support a diversification strategy in line with the logic of positioning (Eisenhardt and Sull 2001; Tan et al. 2010). More specifically, the profile of its members was used to identify attractive market positions in a number of diverse industries that led to the launch of (1) an online-offline motoring publication, (2) an online-offline golf publication, and (3) a printed travel magazine. After the decisions to diversify into these industries were made, the capability of directed community action was once again leveraged to engage its members in the co-development of the content and features of these new innovations in line with the logic of opportunity (Sambamurthy et al. 2003). But more importantly, the critical mass of members became a ready-made audience with pre-existing loyalties, for whom the new offerings were tailored. Consequently, M.com was able to leverage its mature VC as a strategic resource in line with the logic of leverage to generate awareness and demand for its new publications. The evidence from our case study that supports these conclusions are presented in Table 6.

Discussion

By integrating the distinct patterns in which M.com's VC was developed and leveraged across the three stages of development, and mapping the two discrete processes (i.e. development and leverage) along a horizontal axis and a vertical axis, a two-dimensional (2-D) process model of VC-enabled organizational value creation can be inductively derived (refer to Figure 1).

Developing and Leveraging a VC in the Nascent Stage

Grounded in the empirical data, our 2-D model of VC-enabled organizational value creation suggests that to initiate the formation of a VC, a sponsoring organization's efforts should center on three IT competencies: providing infrastructure, managing content and enhancing interactivity. Making available an adequate IT infrastructure (Bharadwaj 2000) is a natural first step for any organization hoping to nurture a VC since the VC, by its very definition, is reliant on technology (Stolterman 1999). Content management is also particularly important in this phase as there tends to be a dearth of member-contributed content in the early stages of VC development (Mohammed et al. 2004). Consequently, by ensuring a continuous influx of high-quality, administrator-generated content, the sponsoring organization can stimulate and maintain the members' interest in the VC (Balasubramanian and Mahajan 2001; Rothaermel and Sugiyama 2001).

VC-enabled Capabilities	Underlying Logic	Representative Quotes
Digitized knowledge richness	Logic of positioning	“We looked at our (membership) database and who did we have? We had (mainly) guys, who are IT professionals, engineers... slightly ‘richer’ people who can afford to travel, own cars... and are starting to pick up golf... So to cater to their (the primary customer segment’s) needs, we launched (an online-offline motoring publication), (an online-offline golf publication)... and (an offline travel magazine)” – M.com Managing Director
Directed community action	Logic of opportunity	“We took the suggestions of our members very seriously... (For example,) many of the features on (M.com’s motoring website) like the consolidated price lists, COE (certificate of entitlement) bidding results for each month... (and the) classified ads directory... came about from the feedback that we received from our community members” – M.com General Manager
Critical mass	Logic of Leverage	“When they launched their new products, they marketed the products aggressively on the (M.com) forum... There were announcements... hyperlinks... and advertisements... they packaged the subscription for their new products with the existing IT magazine... As someone who is interested in IT as well as cars, I joined (M.com’s motoring website) as well... I think about 60% of existing (M.com’s motoring website) members came from the original M.com forum”- VC Member E

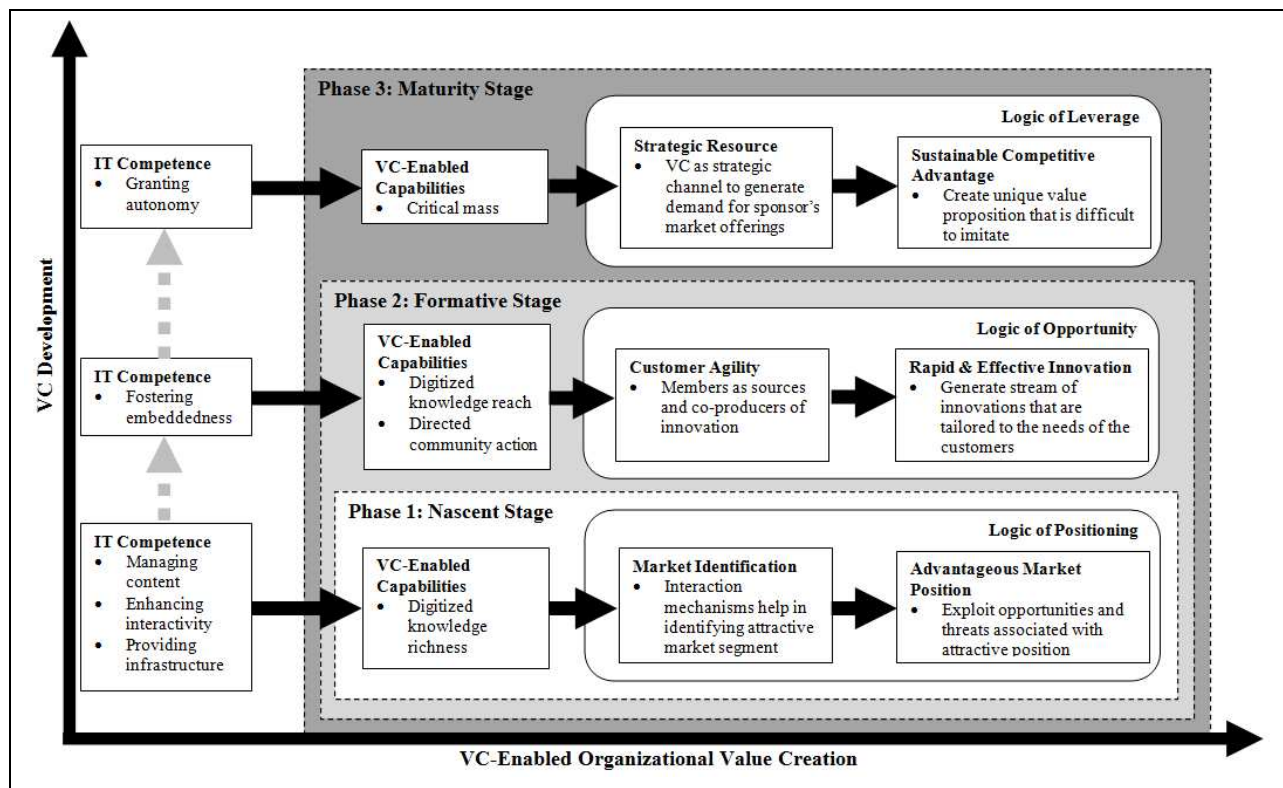


Figure 1: A 2-D Model of VC-Enabled Organizational Value Creation

In addition, the perceived effort of a sponsoring organization to provide quality content tends to promote beliefs about the congruence of the sponsor’s values with, and respect for, the community. This in turn, creates a basic level of trust that stimulates participation and the initiation of relationships between members and the community sponsor (Porter and Donthu 2008; Ridings et al. 2002). Similarly, enhancing the interactivity of a fledgling VC is crucial for two key reasons. First, it lays the foundation for

a step-shift increase in the quality and quantity of member-contributed content (e.g. reviews, opinions and advice) as interactivity works in a virtuous cycle to drive participation and knowledge contribution (Dholakia et al. 2004; Porter and Donthu 2008). Second, it facilitates the formation of subgroups that provide members with the opportunity to discuss a variety of topics related to the community's interest, which in turn, enhances the diversity and attractiveness of the community (Mohammed et al. 2004).

The mechanisms of the three competencies, in turn, precipitate the development of digitized knowledge richness as they enable the creation of a platform that supports member-member and member-sponsor interactions (Sambamurthy et al. 2003). Our 2-D model suggests this VC-enabled capability is crucial to organizational value creation at the nascent stage of VC development. More specifically, the VC, with digitized knowledge richness, enables the sponsoring organization to obtain direct feedback on the existing and expressed needs of the core group of early adopters (Armstrong and Hagel 1996; Porter and Donthu 2008), or monitor the interactions between them to gain an understanding of their future or unexpressed needs (Kozinets 2002; Nambisan 2002). Based on the knowledge obtained, the community sponsor can then enact "*needs-based positioning*" (Porter 1996, p. 66) by occupying a market position that serves the identified needs of their members. This results in the creation of organizational value as the sponsoring organization is able to avoid competitive threats and capitalize on the market opportunities associated with its unique market position (Porter 2001).

However, contrary to Sambamurthy et al.'s framework (2003), which suggests that IT-enabled organizational value creation should be based primarily on a logic of opportunity (Eisenhardt and Sull 2001), our model suggests that a VC is unlikely to facilitate organizational value creation through this mechanism in the nascent stage of development. This is because in the nascent stage, the VC is dominated by early adopters, and while the behavioral and subjective feedback from these members can provide indications on the general direction in which the community should be headed, the needs of early adopters tend to be different from the majority. Consequently, indications derived from the VC at this stage may not provide a reliable basis for developing a continuous stream of innovations that are in line with the overall needs of the targeted audience (Mohammed et al. 2004; Rogers 2003). Likewise, a nascent VC is unlikely to create value for its sponsoring organization through the logic of leverage as the VC, in its immaturity, is easily imitable (Hagel and Armstrong 1997), and may not be sufficiently large (Rothaermel and Sugiyama 2001) or committed to the community sponsor (Porter and Donthu 2008) to be leveraged effectively.

Developing and Leveraging a VC in the Formative Stage

Following the attainment of the nascent stage of VC maturity (Lee et al. 2005a), our process model suggests that to sustain the development of its VC, a sponsoring organization should focus its efforts on the IT competence of fostering embeddedness within the community (Porter and Donthu 2008; Preece 2001). Fostering embeddedness will include measures aimed at creating a sense of virtual community (Blanchard and Markus 2004; Koh and Kim 2003), commitment (Bateman et al. 2010), identification (Bhattacharya and Sen 2003), and a complementary offline presence (Rothaermel and Sugiyama 2001). These measures are especially appropriate in this stage of VC development for a number of key reasons.

First, as the community continues to grow, it becomes increasingly difficult for individual members to maintain the strength of their social ties to the other members of the VC (Rothaermel and Sugiyama 2001; Wellman et al. 1996). Therefore, measures that foster embeddedness are necessary to help members of the growing VC to better identify, understand, and trust each other (Koh and Kim 2003; Porter and Donthu 2008), which serves to broaden and reinforce their mutual ties (Koh and Kim 2003) and compensate for the low social presence inherent in online interactions (Lombard and Ditton 1997). Second, at this juncture of VC development, the social processes within the VC are beginning to mature (Mohammed et al. 2004; Palloff and Pratt 2007), and it is at this point when it becomes possible to embed the economic processes of the sponsoring organization within the underlying social processes to provide additional "*focus-related, consumption and approval-related utility*" (Balasubramanian and Mahajan 2001, p. 128) for the members of the VC. Finally, a growing VC tends to attract a higher proportion of peripheral or non-contributing members (Kim 2000; Mohammed et al. 2004; Zhang and Storck 2001), while at the same time, negative network externalities may emerge that decrease the value of the VC to the core members (Asvanund et al. 2004; Gu et al. 2007), which include the regulars, leaders and elders (Kim 2000) of the community. Consequently, measures that promote embeddedness can mitigate the effects of

these converging forces by enhancing the relationship between the community and the sponsoring organization (Bhattacharya and Sen 2003; Porter and Donthu 2008). This serves to maintain a significant portion of the VC members as “community insiders” (Kozinets 2002, p. 255), which forms a particularly important segment of a commercial VC as insiders tend to be heavier users, more loyal, and amenable to that marketing overtures of the sponsoring organization (Cothrel 2000; Kozinets 2002).

Fostering embeddedness, in turn, will induce the development of the VC-enabled capabilities of digitized knowledge reach and directed community action. Digitized knowledge reach (Sambamurthy et al. 2003) develops as the increased participation that results from embeddedness will facilitate the sharing and accumulation of information in the VC (Ginsburg and Weisband 2006; Li 2004). On the other hand, directed community action is a result of the strengthening of ties between members, as well as their relationship with the sponsoring organization, which makes VC members more willing and able to pool their resources and capabilities to contribute synergistically towards the community sponsor’s cause (Kim 2000; Mohammed et al. 2004). Collectively, these VC-enabled capabilities form the basis of organizational value creation in the formative stage of VC development.

More specifically, our model reveals two possible mechanisms of organizational value creation in the formative stage. First, digitized knowledge reach (Sambamurthy et al. 2003) facilitates the logic of positioning by raising the entry barriers for existing and potential competitors seeking to imitate the market position of the sponsoring organization (Porter 1996). This creates value because adopting a similar position would necessitate an equivalent knowledge base on the topic of interest for competitors, which is difficult to recreate as the accumulation of knowledge requires time and extensive resources (Bieber et al. 2002; Schubert and Ginsburg 2000). Second, directed community action facilitates the logic of opportunity because with an accumulation of members ready to commit their resources and abilities to helping the community sponsor, these members can be engaged in the co-production of innovations (Nambisan 2002; Porter and Donthu 2008). This represents one of the fastest and most effective means of innovation development since the innovations are developed and tailor-made for the VC members by the members themselves (Fuller et al. 2006; Lengnick-Hall 1996). Moreover, as opposed to the nascent stage of VC development when the VC was dominated by early adopters, a VC in the formative stage of maturity consists of a wide spectrum of members that can provide indications on the overall needs of the VC (Kim 2000; Mohammed et al. 2004). This can serve as the basis for developing a stream of innovations to create a series of temporary competitive advantages (Eisenhardt and Sull 2001), or launching competitive actions that create fundamental instability in the organizational environment to keep competitors off-balance (D’Aveni 1994). As noted earlier, these indications may be directly obtained in the form of feedback from the VC members (Armstrong and Hagel 1996; Ginsburg and Weisband 2006; Kannan et al. 2000), or be indirectly gleaned from unobtrusive means such as analyzing the profiles of the members (Balasubramanian and Mahajan 2001; Kozinets 2002) and monitoring the interactions between members in the VC (Hagel and Armstrong 1997; Rothaermel and Sugiyama 2001).

On the other hand, our model suggests that among the three logics of strategy (Eisenhardt and Sull 2001; Tan et al. 2010), only the logic of leverage is less viable in the formative stage. A possible explanation is that despite a significant increase in the number of community members, a VC in the formative stage of development has yet to attain self-sustaining critical mass (Lee et al. 2005a; Mohammed et al. 2004). Critical mass is crucial to the organizational ability to leverage the VC as a strategic resource for two reasons. First, the attainment of critical mass unlocks new possibilities for strategic leverage in the form of transaction, marketing and advertising revenue opportunities (Armstrong and Hagel 1996; Kozinets 2002). Second, critical mass enables the sponsoring organization to emerge as the dominant community for a particular topic of interest (Armstrong and Hagel 1995), which imposes “high switching costs” (Mahadevan 2000, p. 61) for the members of the VC that renders the strategic resource inimitable. In other words, without attaining critical mass, a VC may be unable to serve as a strategic resource for the sponsoring organization as the criteria of being sufficiently valuable or inimitable (Barney 1991; Hoopes et al. 2003) may be violated.

Developing and Leveraging a VC in the Maturity Stage

Finally, following the formative stage of VC development, our process model suggests that a sponsoring organization’s efforts in nurturing its VC should be aligned with the IT competence of granting autonomy. Granting autonomy is particularly important in this phase of VC development because beyond the

formative stage, a VC tends to be both resistant to direct management by the community sponsor (Mohammed et al. 2004; Walden 2000) and too large to be effectively managed (Rothaermel and Sugiyama 2001). Consequently, as the internal structures put in place by the sponsoring organization (Ghazawneh and Henfridsson 2010) to manage content, enhance interactivity, and foster embeddedness since the formation of the VC become increasingly ineffective with VC development (Mohammed et al. 2004), a sponsoring organization can promote self-organization and empower members to develop their own language, protocols and policies within the VC (Jarvenpaa and Majchrzak 2010; Kozinets 2002). This serves to institute an alternative set of internal structures that strikes an appropriate balance between control and autonomy (Ghazawneh and Henfridsson 2010), which sustains the quality of community-generated content, the extent of interactions, and the strength of community relationships by reducing the cost of communications, the complexity of dialogue management, and incidences of negative behaviors such as free-riding and social loafing (Butler 2001). In addition, measures aimed at granting autonomy and promoting self-governance allow members to shape the community dialogue based on their needs (Walden 2000), and promote the perception of their importance and influence within the community (Blanchard and Markus 2004; Jeppesen and Frederiksen 2006). This enables the sponsoring organization to satisfy the demand for more freedom and responsibility (Ke and Zhang 2010) that tends to manifest in the older and more established VCs (Mohammed et al. 2004).

Enacting measures aligned with the IT capability of granting autonomy gives rise to three important outcomes. First, the VC increases in scalability as the installation of appropriate community control mechanisms makes the management of a large member population feasible (Rothaermel and Sugiyama 2001). Second, the trust that VC members have towards the community sponsor increases as relinquishing control over the VC to the members increases openness, as well as removes the perception of, and the potential for, a favorable bias towards the community sponsor (Chua and Yeow 2010; Kannan et al. 2000). Third, the diversity, and hence attractiveness, of the community increases as members are empowered to form their own subgroups, promulgate a variety of subtopics, and assume responsibility for the direction of the community dialogue (Ke and Zhang 2010). Collectively, these outcomes precipitate the development of the VC-enabled capability of critical mass (Markus 1987).

The full range of possibilities for organizational value creation becomes unlocked when a VC attains critical mass (Hagel and Armstrong 1997; Wellman et al. 1996) in the maturity stage. In particular, with critical mass, the VC becomes more valuable in that it can be used as an effective push marketing channel to generate awareness and demand for the sponsoring organization's new market offerings (Balasubramanian and Mahajan 2001; Kozinets 2002). In addition, critical mass renders the value proposition of the community sponsor inimitable as it imposes high switching costs (Mahadevan 2000) that consolidates the VC's position as the de facto community for a particular market segment or topic of interest (Armstrong and Hagel 1995). By imbuing the VC with added value and inimitability (Barney 1991; Peteraf 1993), critical mass enables the creation of organizational value through the logic of leverage (Hoopes et al. 2003). With critical mass and the other VC-enabled capabilities developed in the earlier stages, a VC in the maturity stage is able to create value for its sponsoring organization via all the three logics of strategy (Eisenhardt and Sull 2001; Tan et al. 2010).

Having presented the inductively derived model, it is important that we address a departure from Sambamurthy et al.'s (2003) framework of IT-enabled organizational value creation that served as the theoretical lens of this study. In particular, the framework describes the concept of entrepreneurial alertness, which consists of the capabilities of strategic foresight and systemic insight. Entrepreneurial alertness is seen to be a critical driver of value creation as it is essential for the activation of both digital options and enterprise agility (Sambamurthy et al. 2003). However, from our case study, we observed that entrepreneurial alertness is not only critical for the activation of both digital options and enterprise agility (i.e. through the logic of opportunity - see Sambamurthy et al. 2003), but it may serve as the outcome of the logic of positioning and the antecedent of the logic of leverage as well. For instance, in the case of M.com, we observed that in facilitating the identification of an attractive market position, the VC precipitated entrepreneurial alertness by revealing the opportunities in the saturated market at the point of market entry. Conversely, after the dotcom crisis, we noted that entrepreneurial alertness was crucial to the realization that M.com's existing VC can be leveraged as a strategic resource to generate awareness and demand for their new products.

However, we made a conscious decision to exclude the construct from the inductively derived model for

two reasons. First, as entrepreneurial alertness can variedly serve as the antecedent or the outcome of the three logics of strategy (Eisenhardt and Sull 2001; Sambamurthy et al. 2003), its inclusion will render our model unwieldy and overly complicated, with negative ramifications for the comprehensibility of the model. Second and more importantly, entrepreneurial alertness, in itself, is a non-actionable construct, and since the scope of our study is not on how entrepreneurial alertness can be developed, its exclusion should not detract from the academic and practical significance of our model. Nevertheless, it must be acknowledged that entrepreneurial alertness could be a construct of interest in the overall nomological network, and a more detailed examination of its role in the process of VC-enabled organizational value creation may yet prove a fruitful avenue for future research.

Conclusion

Limitations and Future Research

This article is not without its limitations. Although studies based on the single case research methodology is a “typical and legitimate endeavor” in qualitative research (Lee & Baskerville, 2003, p. 231), a particular criticism that is commonly directed at these studies is the problem of generalizability or external validity (Walsham, 2006). While it must be readily acknowledged that statistical generalization is impossible from a single case study, we nevertheless contend that our study is generalizable beyond its singular context as our process model is not only grounded in the empirical reality of our case study, but is corroborated by the theoretical propositions of some of the most established works in management and organizational literature. As such, this study invokes the principles of “analytic generalization” (Yin, 2003, p. 32) or what Lee and Baskerville (2003, p.235) refers to as “generalizing from description to theory”. Nevertheless, future research can be directed at statistically validating the propositions of this study, so that the boundary conditions of our process model can be better defined.

A second limitation is that despite our efforts to be as inclusive as possible, we acknowledge that it is impossible to exhaustively describe all the possible mechanisms of VC-enabled organizational value creation within a single study. While we are bounded by feasibility concerns and the limits of the data collected, future research can certainly investigate other possible mechanisms that have not been examined in this study. One might begin by looking beyond the three logics of strategy (Eisenhardt and Sull 2001; Sambamurthy et al. 2003), to alternative theories that offer competing prescriptions for creating organizational value. Candidate theories, for example, may include the neo-institutional theory of organizations (Scott 2001) and the theory of organizational ecology (Hannan and Freeman 1977) from the field of organizational sociology that advocate isomorphism, rather than competitive advantage, as the key to organizational value creation.

Theoretical and Practical Contributions

By addressing the research questions set forth at the beginning of this paper, this study makes several important theoretical contributions. First, while a vast array of constructs and propositions for VC development has been proposed in the literature, the process model developed in this study provides a means to integrate them. In particular, we contend that the five VC-enabled capabilities depicted in our model encapsulate many of the drivers of VC development that have been proposed in prior studies. As such, our process model not only integrates many of these drivers in a single, coherent framework, but it also structures them in a step-by-step “*recipe that strings (the drivers) together in such a way as to tell the story of how (the outcome) occurs whenever it does occur*” (Mohr 1982, p. 37). The integration of previously identified drivers has the effect of creating a common base of communications that can potentially prevent the duplication of research efforts, as well as enhance the communication and comparability of results across different studies. In addition, proposing a sequence in which the different drivers should be applied is a conceptual innovation that can serve as a signpost for future research.

Second, due to the inherent difficulties of attributing organizational gains to the specific act of sponsoring a VC (de Moor and Weigand 2007; Lee et al. 2005b), most of prior research on the leverage of VCs has focused on explaining how VCs create value for their members (e.g. Cothrel 2000; Dholakia et al. 2004) instead of the value of VCs for the organizations that sponsor them (Porter and Donthu 2008). By

adopting a case research approach that allowed us to get closer to theoretical constructs that are difficult to measure (Siggelkow 2007), this study contributes to the existing body of knowledge by examining the complex and multi-faceted issues pertinent to VC-enabled organizational value creation directly. As such, this study is one of the few that examines VC-enabled value creation at the organizational level (Porter and Donthu 2008). But more importantly, the intricate interconnectedness of the events, activities and decisions that led to VC-enabled organizational value creation in our case study has helped to eliminate a myriad of possible competing explanations for the organizational gains, which ensures the relevance and utility of the theoretical arguments developed in this paper.

Third, not only is there a lack of research on VC-enabled value creation at the organizational level, but more importantly, many of the existing prescriptions for the leverage of VCs have not been empirically validated. Our study is thus significant as it represents one of the first attempts at formulating an empirically grounded theory (with the exception of Shankar and Bayus 2003) that offers prescriptions for the leverage of VCs from the perspective of the community sponsor. Being among the earliest empirical studies on VC-enabled organizational value creation, we hope that our work can provide a foundation for future studies aimed at validating, extending or establishing the boundary conditions of the theory we presented, and serve as a catalyst for further research in this area. By complementing the existing studies that have examined the VC-enabled value creation from the individual or group levels, this study contributes to a more holistic picture of the phenomenon.

Finally, this study also makes a contribution by extending Sambamurthy et al.'s (2003) framework on IT-enabled organizational value creation. In particular, the framework is based on the assumption that any form of competitive advantage must be fleeting and unsustainable due to the unprecedented turbulence and unpredictability of the modern competitive landscape (McAfee and Brynjolfsson 2008; Sull 2009). Consequently, the primary mechanism for IT-enabled organizational value creation proposed is based on the logic of opportunity, aimed at capturing a series of temporary advantages with a relentless stream of innovations and competitive actions (e.g. Overby et al. 2006; Sambamurthy et al. 2003). However, our study has challenged this assumption by demonstrating that despite a dynamic organizational environment; which transitioned from a state of stability, to a state of turbulence, and back again as a result of the emergence and subsidence of the dotcom crisis, the logics of positioning and leverage can also be salient to IT-enabled organizational value creation. As such, we contend the underlying mechanisms of IT-enabled organizational value creation are not solely determined by the state of the organizational environment, but the nature of, and the organizational capabilities enabled by, the focal IT artifact as well. In particular, if the organizational capabilities enabled by the IT artifact can (1) help in the identification, attainment and retention of an attractive market position (Porter 1996), or (2) provide competitive advantage for the focal organization, and yet, are inimitable by existing and potential competitors (Barney 1991; Peteraf 1993), then, in spite of turbulent environmental conditions, the focal IT artifact may yet be able to facilitate organizational value creation through the logics of positioning or leverage respectively. In addition, our study has adapted some of the key elements of the generic framework to construct a theory that is specific to the context of VCs. Revealing the IT competencies, the VC-enabled capabilities, and the type of enterprise agility that are important in this particular setting is an important contribution, as it presents a more relevant and useful reference for VC practitioners.

References

- Aksulu, A., and Wade, M. "A comprehensive review and synthesis of open source research," *Journal of the Association for Information Systems* (11:11/12) 2010, pp 576-656.
- Armstrong, A., and Hagel, J., III "The real value of on-line communities," *Harvard Business Review* (74:3) 1996, pp 134-141.
- Armstrong, A.G., and Hagel, J., III "Real profits from virtual communities," *Mckinsey Quarterly* (1995:3) 1995, pp 127-141.
- Asvanund, A., Clay, K., Krishnan, R., and Smith, M.D. "An empirical analysis of network externalities in peer-to-peer music sharing networks," *Information Systems Research* (15:2) 2004, pp 155-174.
- Balasubramanian, S., and Mahajan, V. "The economic leverage of the virtual community," *International Journal of Electronic Commerce* (5:3), SPR 2001 2001, pp 103-138.
- Barney, J.B. "Firm resources and sustained competitive advantage," *Journal of Management* (17:1), MAR 1991 1991, pp 99-120.

- Barua, A., and Mukhopadhyay, T. "Information technology and business performance: Past, present and future," in: *Framing the Domains of IT Management: Projecting the Future through the Past*, R.W. Zmud (ed.), Pinnaflex Educational Resources, Cincinnati, OH, 2000.
- Bateman, P.J., Gray, P.H., and Butler, B.S. "The impact of community commitment on participation in online communities," *Information Systems Research*, 2010 (available online at <http://isr.journal.informs.org/cgi/reprint/isre.1090.0265v1>).
- Bharadwaj, A. "A resource-based perspective on information technology: Technology capability and firm performance," *MIS Quarterly* (24:1) 2000, pp 169-196.
- Bhatt, G.B., and Grover, V. "Types of information technology capabilities and their role in competitive advantage: An empirical study," *Journal of Management Information Systems* (22:2) 2005, pp 253-277.
- Bhattacharya, C.B., and Sen, S. "Consumer-Company identification: A framework for understanding consumers' relationships with companies," *Journal of Marketing* (67:2) 2003, pp 76-88.
- Bieber, M., Engelbart, D., Furuta, R., Hiltz, S.R., Noll, J., Preece, J., Stohr, E.A., Turoff, M., and van de Walle, B. "Toward virtual community knowledge evolution," *Journal of Management Information Systems* (18:4) 2002, pp 11-35.
- Blanchard, A.L., and Markus, M.L. "The experienced "sense" of virtual community: Characteristics and processes," *The Database for Advances in Information Systems* (35:1) 2004, pp 65-79.
- Burke, L., and Logsdon, J.M. "How corporate social responsibility pays off," *Long Range Planning* (29:4) 1996, pp 495-502.
- Butler, B.S. "Membership size, communication activity, and sustainability: A resource-based model of online social structures," *Information Systems Research* (12:4) 2001, pp 346-362.
- Carr, N.G. "IT doesn't matter," *Harvard Business Review* (81:5) 2003, pp 41-49.
- Chua, C.E.H., and Yeow, A.Y.K. "Artifacts, actors, and interactions in the cross-project coordination practices of open-source communities," *Journal of the Association for Information Systems* (11:12) 2010, pp 838-867.
- Cothrel, J.P. "Measuring the success of an online community," *Strategy and Leadership* (20:2) 2000, pp 17-21.
- D'Aveni, R.A. *Hypercompetition: Managing the Dynamics of Strategic Maneuvering* Free Press, New York, NY, 1994.
- Dahlander, L., and Frederiksen, L. "The core and cosmopolitans: A relational view of innovation in user communities," *Organization Science* (Articles in advance, 2011 (available online at <http://orgsci.journal.informs.org/cgi/reprint/orgsc.1110.0673v1>).
- de Moor, A., and Weigand, H. "Formalizing the evolution of virtual communities," *Information Systems* (32:2) 2007, pp 223-247.
- Dholakia, U.M., Bagozzi, R.P., and Pearo, L.K. "A social influence model of consumer participation in network- and small-group-based virtual communities," *International Journal of Research in Marketing* (21:3) 2004, pp 241-263.
- Eisenhardt, K.M. "Building theories from case study research," *Academy of Management Review* (14:4) 1989, pp 532-550.
- Eisenhardt, K.M., and Graebner, M.E. "Theory building from cases: Opportunities and challenges," *Academy of Management Journal* (50:1) 2007, pp 25-32.
- Eisenhardt, K.M., and Martin, J.A. "Dynamic capabilities: What are they?," *Strategic Management Journal* (21:10-11) 2000, pp 1105-1121.
- Eisenhardt, K.M., and Sull, D.N. "Strategy as simple rules," *Harvard Business Review* (79:1) 2001, pp 107-116.
- Faraj, S., Jarvenpaa, S.L., and Majchrzak, A. "Knowledge collaboration in online communities," *Organization Science* (Articles in advance, 2011 (available online at <http://orgsci.journal.informs.org/cgi/content/abstract/orgsc.1100.0614v1>).
- Ferlie, E., Fitzgerald, L., Wood, M., and Hawkins, C. "The nonspread of innovations: The mediating role of professionals," *Academy of Management Journal* (48:1) 2005, pp 117-134.
- Fuller, J., Bartl, M., Ernst, H., and Muhlbacher, H. "Community based innovation: How to integrate members of virtual communities into new product development " *Electronic Commerce Research* (6:1) 2006, pp 57-73.
- Garud, R., and Kumaraswamy, A. "Vicious and virtuous circles in the management of knowledge: The case of Infosys Technologies," *MIS Quarterly* (29:1) 2005, pp 9-33.

- Ghazawneh, A., and Henfridsson, O. "Governing third-party development through platform boundary resources," *ICIS 2010 Proceedings*, 2010 (available online at http://aisel.aisnet.org/icis2010_submissions/48).
- Ginsburg, M., and Weisband, S. "Volunteerism and virtual community business success: The case of the Internet Chess Club," *Journal of Organizational Computing and Electronic Commerce* (16:3-4) 2006, pp 325-343.
- Glaser, B.G., and Strauss, A. *The Discovery of Grounded Theory: Strategies for Qualitative Research* Aldine de Gruyter, Hawthorne, NY, 1967.
- Gu, B., Konana, P., Rajagopalan, B., and Chen, H.M. "Competition among virtual communities and user valuation: The case of investing-related communities," *Information Systems Research* (18:1) 2007, pp 68-85.
- Hagel, J., III, and Armstrong, A.G. "Net gain: Expanding markets through virtual communities," *McKinsey Quarterly*(1) 1997, pp 140-153.
- Hoopes, D.G., Madsen, T.L., and Walker, G. "Guest editors' introduction to the special issue: Why is there a resource-based view? Toward a theory of competitive heterogeneity," *Strategic Management Journal* (24:10) 2003, pp 889-902.
- Jarvenpaa, S.L., and Majchrzak, A. "Vigilant interaction in knowledge collaboration: Challenges of online user participation under ambivalence," *Information Systems Research* (21:4) 2010, pp 773-784.
- Jeppesen, L.B., and Frederiksen, L. "Why do users contribute to firm-hosted user communities? The case of computer-controlled music instruments," *Organization Science* (17:1) 2006, pp 45-63.
- Kannan, P.K., Chang, A.-M., and Whinston, A.B. "Electronic communities in e-business: Their role and issues," *Information Systems Frontiers* (1:4) 2000, pp 415-426.
- Ke, W., and Zhang, P. "The effects of extrinsic motivations and satisfaction in open source software development," *Journal of the Association for Information Systems* (11:12) 2010, pp 784-808.
- Kim, A.J. *Community Building on the Web: Secret Strategies for Successful Online Communities* Peachpit Press, Berkeley, Ca, 2000.
- Klein, H.K., and Myers, M.D. "A set of principles for conducting and evaluating interpretive field studies in information systems," *MIS Quarterly* (23:1) 1999, pp 67-93.
- Koh, J., and Kim, Y.-G. "Sense of virtual community: A conceptual framework and empirical validation," *International Journal of Electronic Commerce* (8:2) 2003, pp 75-93.
- Kozinets, R.V. "E-tribalized marketing? : The strategic implications of virtual communities of consumption," *European Management Journal* (17:3) 1999, pp 252-264.
- Kozinets, R.V. "The field behind the screen: Using netnography for marketing research in online communities," *Journal of Marketing Research* (39:1) 2002, pp 61-72.
- Langley, A. "Strategies for theorizing from process data," *Academy of Management Review* (24:4) 1999, pp 691-710.
- Lee, M.S., Sutanto, J., Kankanhalli, A., and Tan, B.C.Y. "Coverting online community visitors to online consumers," in: *Encyclopedia of Virtual Communities and Technologies*, S. Gupta (ed.), Idea Group, Hershey, PA, 2005a, pp. 54-60.
- Lee, M.S., Sutanto, J., Kankanhalli, A., and Tan, B.C.Y. "Virtual community models in relation to e-business models: Creating Value," in: *Encyclopedia of Virtual Communities and Technologies*, S. Gupta (ed.), Idea Group, Hershey, PA, 2005b, pp. 527-532.
- Lengnick-Hall, C.A. "Customer contributions to quality: A different view of the customer-oriented firm," *Academy of Management Review* (21:3) 1996, pp 791-824.
- Li, H. " Virtual community studies: A literature review, synthesis and research agenda," *AMCIS 2004 Proceedings*, 2004 (available online at <http://aisel.aisnet.org/amcis2004/324/>).
- Lin, H.-F. "Determinants of successful virtual communities: Contributions from system characteristics and social factors," *Information & Management* (45:8) 2008, pp 522-527.
- Lombard, M., and Ditton, T. "At the heart of it all: The concept of presence," *Journal of Computer Mediated Communications* (3:2), 1997 (available online at <http://onlinelibrary.wiley.com/doi/10.1111/j.1083-6101.1997.tb00072.x/full>).
- Ma, M., and Agarwal, R. "Through a glass darkly: Information technology design, identity verification, and knowledge contribution in online communities," *Information Systems Research* (18:1) 2007, pp 42-67.
- Mahadevan, B. "Business models for Internet-based e-commerce: An anatomy," *California Management Review* (42:4) 2000, pp 55-69.
- Markus, M.L. "Toward a "critical mass" theory of interactive media: Universal access, interdependence

- and diffusion," *Communication Research* (14:5) 1987, pp 491-511.
- McAfee, A., and Brynjolfsson, E. "Investing in the IT that makes a competitive difference," *Harvard Business Review* (86:7-8) 2008, pp 98-107.
- Mohammed, R.A., Fisher, R.J., Jaworski, B.J., and Paddison, G.J. *Internet Marketing: Building Advantage in a Networked Economy*, (2nd ed.) McGraw-Hill, New York, NY, 2004.
- Mohr, L.B. *Explaining Organizational Behavior* Jossey-Bass, San Francisco, CA, 1982.
- Nambisan, S. "Designing virtual customer environments for new product development: Toward a theory," *Academy of Management Review* (27:3) 2002, pp 392-413.
- Overby, E., Bharadwaj, A., and Sambamurthy, V. "Enterprise agility and the enabling role of information technology," *European Journal of Information Systems* (15:2) 2006, pp 120-131.
- Palloff, R.M., and Pratt, K. *Building Online Learning Communities: Effective Strategies for the Virtual Classroom* (2nd ed.) Jossey-Bass, San Francisco, CA, 2007.
- Pan, S.L., and Tan, B. "Demystifying case research: A structured-pragmatic-situational (SPS) approach to conducting case studies," *Information & Organization* (21:3) 2011, pp 161-176.
- Pavlou, P.A., and El Sawy, O.A. "From IT leveraging competence to competitive advantage in turbulent environments: The case of new product development," *Information Systems Research* (17:3) 2006, pp 198-227.
- Peteraf, M.A. "The cornerstones of competitive advantage: A resource-based view," *Strategic Management Journal* (14:3) 1993, pp 179-191.
- Porter, C.E. "A typology of virtual communities: A multi-disciplinary foundation for future research " *Journal of Computer Mediated Communications* (10:1), 2004 (available online at <http://jcmc.indiana.edu/vol10/issue1/porter.html>).
- Porter, C.E., and Donthu, N. "Cultivating trust and harvesting value in virtual communities," *Management Science* (54:1) 2008, pp 112-128.
- Porter, M.E. "What is Strategy?," *Harvard Business Review* (74:6) 1996, pp 61-78.
- Porter, M.E. "Strategy and the Internet," *Harvard Business Review* (79:3) 2001, pp 63-78.
- Powell, T.C., and Dent-Micallef, A. "Information technology as competitive advantage: The role of human, business and technology resources," *Strategic Management Journal* (18:5) 1997, pp 375-405.
- Preece, J. "Socialbility and usability: Twenty years of chatting online," *Behaviour & Information Technology* (20:5) 2001, pp 347-356.
- Rai, A., Patnayakuni, R., and Seth, N. "Firm performance impacts of digitally enabled supply chain integration capabilities," *MIS Quarterly* (30:2) 2006, pp 225-246.
- Ravichandran, T., and Lertwongsatien, C. "Effect of information systems resources and capabilities on firm performance: A resource-based perspective," *Journal of Management Information Systems* (21:4) 2005, pp 237-276.
- Ray, G., Muhanna, W.A., and Barney, J.B. "Information technology and the performance of the customer service process: A resource-based analysis," *MIS Quarterly* (29:4) 2005, pp 625-652.
- Rheingold, H. *The virtual community: Homesteading on the electronic frontier* Addison-Wesley, Reading, MA, 1993.
- Ridings, C., Gefen, D., and Arinze, B. "Some antecedents and effects of trust in virtual communities," *Journal of Strategic Information Systems* (11:3-4) 2002, pp 271-295.
- Rogers, E.M. *Diffusion of Innovations*, (5th ed.) Free Press, New York, NY, 2003.
- Rothaermel, F.T., and Sugiyama, S. "Virtual internet communities and commercial success: Individual and community-level theory grounded in the atypical case of Timezone.com," *Journal of Management* (27:3) 2001, pp 297-312.
- Sambamurthy, V., Bharadwaj, A., and Grover, V. "Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms," *MIS Quarterly* (27:2) 2003, pp 237-263.
- Sangwan, S. "Virtual community success: A uses and gratifications perspective," *Proceedings of the 38th Hawaii International Conference on System Sciences*, 2005 (available online at <http://csdl2.computer.org/comp/proceedings/hicss/2005/2268/07/22680193c.pdf>).
- Santhanam, R., and Hartono, E. "Issues in linking information technology capability to firm performance," *MIS Quarterly* (27:1) 2003, pp 125-153.
- Schubert, P., and Ginsburg, M. "Virtual communities of transaction: The role of personalization in electronic commerce," *Electronic Markets* (10:1) 2000, pp 45-55.
- Shang, R.-A., Chen, Y.-C., and Liao, H.-J. "The value of participation in virtual consumer communities on brand loyalty," *Internet Research* (16:4) 2006, pp 398-418.

- Shankar, V., and Bayus, B.L. "Network effects and competition: An empirical analysis of the home video game industry," *Strategic Management Journal* (24:4) 2003, pp 375-384.
- Siggelkow, N. "Persuasion with case studies," *Academy of Management Journal* (50:1) 2007, pp 20-24.
- Sirmon, D.G., Hitt, M.A., and Ireland, R.D. "Managing firm resources in dynamic environments to create value: Looking inside the black box," *Academy of Management Review* (32:1) 2007, pp 273-292.
- Strauss, A., and Corbin, J. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, (2nd ed.) Sage, Thousand Oaks, CA, 1998.
- Sull, D. "How to thrive in turbulent markets," *Harvard Business Review* (87:2) 2009, pp 78-88.
- Tan, B., Pan, S.L., and Hackney, R. "The strategic implications of web technologies: A process model of how web technologies enhance organizational performance," *IEEE Transactions on Engineering Management* (57:2) 2010, pp 181-197.
- Tan, B., Pan, S.L., Lu, X., and Huang, L. "Leveraging digital business ecosystems for enterprise agility: The tri-logic development strategy of Alibaba.com," paper presented at the International Conference on Information Systems, Phoenix, USA, 2009.
- Wade, M., and Hulland, J. "The resource-based view and information systems research: Review, extension, and suggestions for future research," *MIS Quarterly* (28:1) 2004, pp 107-142.
- Walden, E. "Some value propositions of online communities," *Electronic Markets* (10:4) 2000, pp 244-249.
- Walsham, G. "Interpretive case studies in IS research: Nature and method," *European Journal of Information Systems* (4:2) 1995, pp 74-81.
- Walsham, G. "Doing interpretive research," *European Journal of Information Systems* (15:3) 2006, pp 320-330.
- Wang, P., and Ramiller, N.C. "Community learning in information technology innovation," *MIS Quarterly* (33:4) 2009, pp 709-734.
- Wellman, B., Salaff, J., Dimitrova, D., Garton, L., Gulia, M., and Haythornthwaite, C. "Computer networks as social networks: Collaborative work, telework and virtual community," *Annual Review of Sociology* (22) 1996, pp 213-238.
- Yin, R.K. *Case Study Research: Design and Methods*, (3rd ed.) Sage, Thousand Oaks, CA, 2003.
- Zhang, W., and Storck, J. "Peripheral members in online communities," *AMCIS 2001 Proceedings*, 2001 (available online at <http://aisel.aisnet.org/amcis2001/117>).
- Zhu, K., and Kraemer, K.L. "E-commerce metrics for net-enhanced organizations: Assessing the value of e-commerce to firm performance in the manufacturing sector," *Information Systems Research* (13:3) 2003, pp 275-295.