Developing An Agile It Capability Accompanying Business's Fast Growing: A Case Study On A Chinese E-Commerce Company

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DEVELOPING AN AGILE IT CAPABILITY ACCOMPANYING BUSINESS'S FAST GROWING: A CASE STUDY ON A CHINESE E-COMMERCE COMPANY

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Abstract

IT capability is critical significant to build enterprise agility and promote organizational performance. However, IT capability is always treated as the causal factor already existing and there are few studies on how IT capability is developed. To address this research question, we choose M company, one of the largest fast growing entrepreneurial e-commerce enterprise in China, and conduct a single case study to analyze how IT capability is formed accompanying business’s fast growing. We find that M company has designed and implemented many specific mechanisms in order to tackle the problems caused by business’s fast growing. For a specific problem, what M company has done could be categorized into three periods, respectively pre-event, during-the-event and post-event. M company has obtained an agile IT capability composed of scientific planning capability, improvisation capability and timely feedback capability in the three periods individually by tackling different problems flexibly. We also summarize a process model to illustrate the approach of how IT capability is formed. Finally, the theoretical and practical implications are also discussed.

Keywords: IT Capability, Enterprise Agility, Fast Growing Enterprise, Process Model, Case Study.
INTRODUCTION

Nowadays businesses are confronted with a turbulent environment, i.e., globalization, dramatic regulatory uncertainties, acute time-to-market pressures and technology advancement, which brings a hyper-competition among businesses. The engine behind this accelerated competition is believed as the information technology (IT), as more organizations have moved to bolster (or altogether replace) their existing operating models using the internet and enterprise software (McAfee & Brynjolfsson 2008), thus there is a sharp increase in the quantity and quality of IT investments, which makes IT become a hot topic in the practical domain and theoretical area.

At the same time, scholars in information systems (IS) discipline also pay lots of attention to IT, and one important focus is IT capability. IT capability is considered as the organisational comprehensive ability, not only including hard capabilities of IT infrastructure, but also soft capabilities of utilizing IT resources, i.e., IT infrastructure capability, IT business spanning capability and IT proactive stance (Lu & Ramamurthy 2011), which is critically important to enterprises. For example, IT capability is considered as an important enabler of developing enterprise agility which is helpful for companies to consistently fast discover and seize market opportunities in the turbulent environment (Sambamurthy et al. 2003; Overby et al. 2006; Van Oosterhout et al. 2006). Moreover, IT capability is always thought having a significant effect on organizational business, performance, strategy and competitive advantage (Melville et al. 2004). By keeping IT capability alignment with corporate strategies or business, companies could tackle the environmental dynamics and obtain superior performance (Luftman 2003; Weiss & Anderson 2004). Those firms with superior IT capability indeed exhibit superior current and sustained firm performance when compared to average industry performance, even after adjusting the effects of prior firm performance (Santhanam & Hartono 2003).

The importance of IT capability has attracted scholars’ attention. For example, some scholars analyze the dimensions of IT capability, dividing it into three dimensions, i.e., IT infrastructure capability, IT business spanning capability and IT proactive stance, respectively (Lu & Ramamurthy 2011), or a fusion of business knowledge with IS knowledge, a flexible and reusable IT platform, and an effective use process (Peppard & Ward 2004). Some scholars explore how to use IT capability to support organizations, i.e., companies could transform IT capability into organizational agility by several ways, such as through agile IT adoption or repeated improvisation mechanism (Goh et al. 2010; Tan et al. 2010); especially to those e-commerce companies, if they want to make success, they must be able to combine IS resources in new ways and do this repeatedly and rapidly (Daniel & Wilson 2003).

As mentioned above, IT capability has already been well studied, however, there are still some limitations in the previous literatures. (1) IT capability is always treated as a causal factor already existing, but few studies have analyzed how IT capability is developed. This limitation has already been noticed and addressed by some scholars, i.e., Bi et al. (2011), which offer much insight to the question how IT capability is formed; however, relevant studies are just beginning, and we need more researches focusing on this gap. Moreover, although some researchers have discussed the dimensions of IT capability (i.e., IT infrastructure capability, IT business spanning capability and IT proactive stance, or a fusion of business knowledge with IS knowledge, a flexible and reusable IT platform, and an effective use process), they don’t explain how to make a spanning or a fusion and how to effectively use the IT infrastructure. Therefore how to develop IT capability is still obscure. (2) What’s more, existing literatures don’t pay much attention to those fast growing enterprises, which commonly exist in the market (Jordan & Pham 2011). Fast growing enterprises are those firms with a 3-year compound annual sales growth rate of 80% or above; fast growing is difficult to achieve and maintain, in fact, only one in seven firms generate sustained, profitable growth (Zook & Allen 1999), so examining how those fast growing enterprises manage their IT capability to support business growing can help all firms better understand the attributes and behaviours associated with firm growth (Barringer et al. 2005).

So the research question in this paper is how those fast growing enterprises develop their IT capability accompanying business’s fast growing. Based on dynamic capability theory, we choose a fast growing
Chinese B2C e-commerce company M and conduct a single case study to address the research question above. Through analyzing how M company uses its IT resources to settle the problems along with business’s fast growing and then achieve an alignment between IT and strategy and business, we try to look for a path of how IT capability is constructed. The result of this research will contribute to the literatures of IT capability, and will also sheds lights to those companies who want to leverage their IT capability.

The remainder of this paper is organized as follows. The following section is the theoretical foundation for this research and then introduced is the research methodology. The fourth section presents case description and data analysis, and the fifth section is the discussion on the findings in data analysis. At last the paper concludes with a summary of the implications and the limitations.

2 THEORETICAL FOUNDATION

2.1 IT capability

There are three major kinds of different opinions about IT capability. The first one treats IT capability as IT technical capability emphasizing IT hardware and IS systems. For example, some scholars define IT capability as the ability of a computer system—the integration of computers and related technologies in an organization—to store, process, and communicate information (Bakos 1985; Nakata et al. 2008), or the capabilities of the IS functions which can be operationalized in terms of general technical expertise and technological leadership in the industry (Teo & King 1997).

Then is the one regarding IT capability as the soft organizational capability of managing and utilizing IT infrastructures. For example, some scholars argue that IT capability is the managerial capability requiring a firm to acquire, deploy, and leverage its IT investments productively (Sambamurthy & Zmud 1992), or requiring a firm to acquire the ability to control IT-related costs, deliver systems when needed, and affect business objectives through IT implementations (Ross et al. 1996).

The last one is a comprehensive view, not only including hard capabilities of IT infrastructure, but also soft capabilities of utilizing IT resources. This opinion treats IT capability as a ability to mobilize and deploy IT-based resources in combination with other resources and capabilities in order to achieve business objectives through IT implementations (Byrd & Turner 2000; Zhang & Tansuhaj 2007). Furthermore, it also could be divided into three dimensions, i.e. IT infrastructure capability, IT business spanning capability and IT proactive stance (Lu & Ramamurthy 2011), or a fusion of business knowledge with IS knowledge, a flexible and reusable IT platform, and an effective use process (Peppard & Ward 2004). It’s obvious that these two kinds of division above are much similar with each other. Nowadays more and more scholars have adopted this comprehensive concept, so do we in this paper.

2.2 Dynamic capability theory

The research question that how a company develops its IT capability accompanying business’s fast growing embodies two key points: the uncertainty of environment and the development of organizational IT capability, which is suitable to be explained by dynamic capability theory.

Dynamic capabilities are defined as the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (Teece et al. 1997). Dynamic capability theory adopts a process perspective, thinking organizational capabilities are not static but dynamic and they could be renewed by learning. With the help of this theory, some scholars have tried to answer the question that how organizations develop, manage and deploy their capabilities. For example, Montealegre argue that companies could obtain IT capability by manipulating different factors in three stages, respectively establishing direction, focusing on the strategy development and institutionalizing the strategy (Montealegre 2002). Moreover, Moustaghfir explains how knowledge assets, through learning mechanisms, are linked, renewed, and leveraged into socio-technical
processes or organizational routines, which in turn form the basis of organizational capabilities (Moustaghfir 2009). As stated above, scholars try to use this theory to link corporate resources and rapidly changing environment together, and answer the questions that how organizational resources are developed, utilized and integrated into firms (Winter 2003), which is suitable to analyze the process of how a capability is formed.

Thus dynamic capability theory is helpful to link environment dynamics and outcomes (i.e. capability) together. Since we want to explore how IT capability is formed accompanying the dramatic growing business, therefore dynamic capability theory is suitable as our theoretical foundation to analyze how IT capability is formed accompanying business fast growing.

2.3 Critical literature review

After dynamic capability theory is being introduced into IS discipline, more and more studies begin to use this theory to conduct researches about IT capability (Wade & Hulland 2004). Firstly, scholars have sensed the importance of IT capability, just as some scholars predicate that “IS resources may take on many of the attributes of dynamic resources, and thus may be particularly useful to firms operating in rapidly changing environments”, and even if IS resources do not directly bring superior sustainable competitive advantage to a firm, “they may nonetheless be critical to the firm’s longer-term competitiveness in unstable environments if they help it to develop, add, integrate, and release other key resources over time” (Jarvenpaa & Leidner 1998).

With the deepening of the relevant researches, how IT capability is developed is also being noticed. First, some scholars analyze the dimensions of IT capability. For example, Peppard and Ward (2004) divide the evolution of IT in organization into three ears, respectively data processing, management information systems, and strategic information systems (SIS), and concept IT capability after SIS era as IS capability, which is composed of three dimensions, i.e., a fusion of business knowledge with IS knowledge, a flexible and reusable IT platform, and an effective use process. In order to explore the link between IT capability and organizational agility, some scholars also concept IT capability as a latent construct having three dimensions, i.e., IT infrastructure capability, IT business spanning capability, and IT proactive stance respectively (Lu & Ramamurthy, 2011), which is much similar with Peppard and Ward’s research in 2004. Moreover, in order to analyze how competitive advantage is obtained, some scholars divides IT capability into three types, value capabilities, competitive capabilities, and dynamic capabilities, which are separately corresponding to IT infrastructure, IT management capability and intensity of organizational learning (Bhatt et al. 2005). These researches above offer much help in understanding IT capability and the different effect of different dimensions of IT capability on the potential dependent variables, i.e., organizational agility, or competitive advantage. However, IT capability is still treated as the causal factor already existing in these papers, and we still have little knowledge on how IT capability is developed.

Based on the divisions of IT capability, some researches attempt to explore the potential path of IT capability. For example, some scholars take e-commerce as research context, hold that e-commerce is characterised by rapid change, if managers want to make success, they must be able to combine all kinds of resources in new ways and do this repeatedly and rapidly (Daniel & Wilson 2003), however, they don’t present a clear approach to explain how to combine. Taking Beijing International Airport as case objective, some scholars explores how agile IT practices are developed in an organization; they identify four distinct types of agile IT adoption practices, and think that organizational capabilities could be transferred into agile IT adoption practices through the appropriate use of organizational control mechanisms contingent upon trust of its stakeholders (Goh et al. 2010), which contributes much to the research on IT capability. Moreover, some other scholars address this gap by conceptualizing IT capability as the outcome of a path-specific resource building process, and posit that through the use of appropriate IT infrastructure, and the development of “back-end integration” and “front-end functionalities”, e-commerce centric IT expertise could be harnessed to provide the right information to the right customers at the right time, giving rise to a firm-specific IT capability (Bi et al. 2011). The research above offers much insight to the question how IT capability is formed; however, only these is not adequate, and we need more studies to rich our understanding.
3 RESEARCH METHODOLOGY

As a methodology, case study is well suited for theory construction and testing. It’s helpful to explain the new phenomena emerging in managerial practice, and questions on “how” and “why” through deeply analysis (Eisenhardt 1989; Eisenhardt & Graebner 2007; Pettigrew 1990), thus we choose case study as our research methodology.

3.1 Case Selection

We choose a Chinese e-commerce company M, M company was set up in 1998 and a pure physical store before entering e-commerce. It had been keeping growing by the rate more than 200% since entering e-commerce area in 2004 and became one of China’s biggest 3C online shopping platforms after 6-year dramatic growth. In the year 2010, M company had become one of Top 3 B2C e-commerce enterprises in China whose sale had exceeded 10 billion RMB and accounted for 35.6% market share in China’s B2C market. And after a face-to-face negotiation, M company accepts our interview and allows our team to enter the company. Table 1 is a concisely description of its organizational structure.

<table>
<thead>
<tr>
<th>The Corporate Top Tier</th>
<th>IT Department</th>
<th>Business Department</th>
<th>Other Department</th>
</tr>
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<tbody>
<tr>
<td>Support-related subunits</td>
<td>Customer-related subunits</td>
<td>Support-related subunits</td>
<td>Customer-related subunits</td>
</tr>
<tr>
<td>Support-Related Data Centre</td>
<td>Customer-Related Data Centre</td>
<td>Business Department</td>
<td>Other Department</td>
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<tr>
<td>Platform Architecture Division</td>
<td>Transaction System Division</td>
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<tr>
<td>Support-related Product Division</td>
<td>Customer-Related Product Division</td>
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<td>Logistics Division</td>
<td>IT Planning Division</td>
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<td>Testing Division</td>
<td>R&amp;D Division</td>
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<tr>
<td>Support-Related Supply Chain Division</td>
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Table 1 Organizational structure of M company

As described in Table 1, the subunits of IT department can be divided into two parts: customer-related subunits whose work is more close to customer and support-related subunits whose work is more relevant to other business departments. Our interviewees are all from IT department. As an entrepreneurial enterprise, the business department in M company is too busy to accept our interview, and the corporate top tier appoints IT department to cooperate with us for the interview, because they give a high evaluation on IT department’s past work. And a vice president of the whole company even told us “It’s no exaggeration that we could do nothing without IT department”. Another reason is that it’s their first time to allow a pure academic research team entering their company, so they maybe still have some worries about their business, such as business secrets and interruptions.

However, only interviewing IT department is also useful and reasonable. Because firstly the leader in charge of IT department is a vice president of the whole company, who knows the corporate strategies and the business department well. Furthermore, IT department is one of the key departments in M company, and is responsible to support corporate strategies, process business orders, and manipulate the corporate IS systems. Moreover, employees in IT department is also expanding along with the corporate developing, changing from 6 in 2004 to more than 800 in 2011(till our interview), which is a dramatic reflection of the changing in the whole company. Thus the IT infrastructure, the potential ability of using IT infrastructure and the corporate IT planning are all strongly relevant to IT department. So only analyzing IT department is useful and reasonable in some extent.

3.2 Data Collection Process

Data collection and data analysis are two major tasks in case study. Unlike conventional approaches that separate the two, we conduct them in tandem in order to make use of the flexibility of case study (Pan & Tan 2011), and the concrete process includes three stages as follows.
The first stage is archival data collection. In order to collect data as much as possible, we employ all the Ph.D. candidates in our team (exactly six) to collect external publications. They have collected paper publications and webpage contents, including the top managers’ micro-blog. We have also gotten many internal publications from M company, which offer much help to us to conduct our study. There will be an internal meeting each week to discuss the new progresses of data collection, which will be recorded for future work.

Then following is field interview. We have conducted a field interview from 8th November to 10th November in 2011, and the interviewees are all chief managers from every subunit in IT department. Thus there are 11 interviewees in all and each person has spent about 1 hour. The interview is conducted in the semi-structured form and two professors act as the chief interviewers, and six PhD candidates write notes and add their own interesting questions. After signing a privacy-protecting contract, we record the voice of the whole interview and transcribe them into texts after the interview immediately, and the amount of the texts is about 100 000 Chinese words.

The multi-channel data collection approach could check the same thing from different aspects, which is good to guarantee the validity and reliability of our study. However, in order to highlight the reliability of our data and also because of the word-limitation, we only present the quotations in the section of case description. The last stage is data analysis, which is done by the authors of this paper, and more details will be introduced in the next part.

3.3 Data Analysis Methods

We use structured–pragmatic–situational (shorted as S-P-S) approach to conduct our study, which is addressed to the following three gaps about the traditional approach: (1) articulate general principles/guidelines that are difficult to translate into specific, operational steps, (2) hold only under idealized conditions and may be unworkable in the field, and (3) emphasize the need to be flexible without explaining how flexibility can be achieved. The S-P-S approach is composed of eight steps: (1) access negotiation, (2) conceptualizing the phenomenon, (3) collecting and organizing the initial data, (4) constructing and extending the theoretical lens, (5) confirming and validating data, (6) selective coding, (7) ensuring theory-data-model alignment, and (8) writing the case report (Pan & Tan 2011), which is a practical approach and shows good reliability and validity, and papers using this approach are also recognized with good reputation (Goh et al. 2010; Pan & Tan 2011; Tan et al. 2010; Tan et al. 2011).

In order to better analyze the data and present our findings, structural and visual strategy is adopted, which is to condense the large amount of data into a more manageable size and present the emergent model more concisely. A logic structure as shown in Figure 1 is used as the visual strategy.

![Figure 1: Framework of data analysis](image)

This three-step process model is inspired by Newman and Robey’s research in 1992. They compare the differences between factor model and process model, thinking that process models focus specifically on sequences of events over time in order to explain how and why particular outcomes are reached (Newman & Robey 1992). Thus, referring to their study, we construct a three-step sequence for the work of what IT department has done (respectively identifying problems, designing mechanisms and concrete actions) as our analytical framework to present the data and our findings.

With the business’s fast growing, there are arising many challenges to IT department in their daily work. IT department needs to firstly analyze the concrete situations and identifying what problems they are facing, then design relevant mechanisms and take some concrete actions to implement these mechanisms. The three-step responding process here is an illustration of how IT department settle those potential problems. Directing by those mechanisms, IT department has obtained some specific
capabilities correspondingly after processing those problems repeatedly. So we presume that it’s the designed mechanisms that forms the foundation of IT capability.

4 CASE DESCRIPTION

With the fast expanding of M company, IT department has to work under high pressure and employ more staffs. Firstly IT department has to handle more than 500,000 orders each day at present, suggesting it should pay much attention to their information systems and guarantee them reliable. Secondly, it has to make efforts to continuously provide better services for their consumers and meet the growing demands. What’s more, because of its expansion, IT department should not only strengthen collaboration but also keep feedback in IT department or with other departments.

In order to respond to these challenges above, IT department has designed many mechanisms and done lots of work which are all specific applications or actions to implement relevant mechanisms. However, different from those stable developing companies in which different problems maybe happen one by one in different periods, as a fast growing company, these problems in M company are always springing up suddenly at the same time. So it’s very difficult to recognize an accurate process of an event because the problem is evolving dynamically and the relevant responding actions are also changing correspondingly. Thus we put those similar work together and categorize all work into three “periods”, namely pre-event, during-the-event and past-event. The “event” here is not a specific action but all kinds of IT projects set up definitely or indefinitely to solve the dynamic problems by IT department. There will be a clear description about each period in the logic structure of “identifying problems → designing mechanisms → concrete actions” as shown in Figure 1.

4.1 Pre-event: planning the whole

After entering e-commerce domain, the speed of business growth in M company is always exceeding 200% every year, which brings many challenges to IT department. Those challenges could be categorized into two different kinds: some from top tier and others from business department. Because the top tier plans to transform the whole company into a technical and logistic company, they have high expectations on IT department and authorize many privileges to IT department, for example, no limitation on the number of employees in IT department. However, the high expectations and privileges are all special forms of pressures from the perspective of IT department. So how to support the corporate strategy is a problem that IT department needs to think over.

The challenges from business department are more common to IT department. With the business’s fast growing, the daily orders are huge and IT department should guarantee IS systems dependable. Furthermore, there are also emerging many new business patterns and some old business patterns are also needed to be improved, which are all concrete events that IT department has to process. At last since business department are always changing their demands in order to offer better user experience, IT department needs to improve their predictability of their work (Shown in Table 2).

These challenges bring two problems to IT department: how to support the corporate strategy and how to meet the fast growing business demands. In order to process these problems, staffs in IT department design two mechanisms: they decide to improve the predictability to business requirements and apply a scientific task allocation.

In order to implement these mechanisms, IT department has taken many concrete actions. For example, the director in charge of IT department will lead all middle and higher managers to discuss the corporate strategy or recent important issues in their regular meetings to grasp the key points of the top tier and adjust their plan correspondingly in every Monday morning. They also discuss all tasks in the next week or month openly and decide the priority of every task in the meeting. For example, they discuss openly to decide which events should be completed firstly and which events could be put off a little late according to the specific situations and the corporate strategy. The whole process in pre-event period is concisely shown in Table 2.
Identifying Problems

<table>
<thead>
<tr>
<th>Quotations</th>
<th>Key Points</th>
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<tbody>
<tr>
<td>“However, our IT infrastructures and IS systems seem to lag behind and sometimes can’t meet the requirements of business department.” — Vice Director of R&amp;D Division</td>
<td>P1: How to meet the fast growing business demands?</td>
</tr>
<tr>
<td>“It’s difficult to predict the requirements of business department since they may change their demands suddenly when they want to improve the existing business patterns, bringing sundry pressures to our work.” — Director of Support-Related Product Division</td>
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Designing Mechanisms

<table>
<thead>
<tr>
<th>Quotations</th>
<th>Key Points</th>
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<tr>
<td>“We decide to make our work more predictable, that is to say we should understand the corporate strategies and predict the potential demands in advance.” — Director of Transaction System Division</td>
<td>M1: Improving the predictability to business requirements</td>
</tr>
<tr>
<td>“We must consider the details much more than the top tier to grasp their key points.” — Director of Customer-Related Data Center</td>
<td>M2: Applying a scientific task allocation</td>
</tr>
<tr>
<td>“We could allocate the daily tasks scientifically, for example, recognizing and categorizing the key problems firstly, then prioritizing the different tasks and tackling them one by one.” — Director of IT Planning Division</td>
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Concrete Actions

<table>
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<tr>
<th>Quotations</th>
<th>Key Points</th>
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<tr>
<td>“There will be a regular meeting on Monday and all product managers will be present. Each product manager will post his own tasks and they will discuss all tasks together to decide which should be first and which could be put off a little later. And we always could allocate all tasks in an order as satisfied as possible and tackle the potential conflicts on the spot.” — Director of Transaction System Division</td>
<td>A1: Regular discussing meeting for making plans</td>
</tr>
<tr>
<td>“Take a two-month plan for example. Our testing staff will discuss with project managers face-to-face after the plan is drafted and then category different subtasks separately.” — Director of Testing Division</td>
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</table>

Table 2 Concrete problems, mechanisms and actions in pre-event period (The letters P, M and A are shorted for Problem, Mechanism and Action respectively, so are those in other tables).

4.2 During-the-event: strengthening collaboration

User experience is an important factor to the success of e-commerce companies, and those companies that could provide better user experience are more possible to win fierce competition. In the recent years, China’s EC marketing is keeping booming, and there are almost 6 000 B2C companies in China, so M company is facing fierce competition. Although still being the Top 3 in China B2C market, M company has already realized that providing better service and improving user experience should be the focus of the whole company (Shown in Table 3).

Since improving user experience involves the whole company, it’s very necessary to strengthen cooperation in the whole company. Thus IT department has designed two mechanisms: strengthening collaboration among different subunits and doing team work in each unit. Directed by these two mechanisms, IT department has taken many concrete actions such as BI and many relevant systems to improve user experience and received good results.

Take new IS application development for example. When business department plans to apply a new business pattern, the new pattern will be delivered to IT department in the form of business demand. This demand will firstly be delivered to customer-related product managers who will transform the business demand into technical demand from the view of business, then to support-related product division who will analyze how to implement it from the view of technology. After being developed, it will be tested by testing division and then brought back to customer-related product managers. This is a process flow involving every subunit and IT department must prevent the flow from being disturbed, so every unit should not only do team work inside but also collaborate with other unit very well.
4.3 Post-event: keeping feedback

With business’s fast growing, the staffs in IT department are also expanding, from 6 in 2004 to over 800 in 2011 (till our interview). Because e-commerce is a relatively new industry in China, and the demand of staffs relevant to e-commerce are out of supply, so it’s difficult for M company to find qualified employees easily. Therefore lots of staffs in IT department are from other industries, such as finance and telecommunication.

Because of different business background, sometimes it’s difficult for IT staffs to collaborate in IT department or with business staffs very well, for they couldn’t understand other people very well. Responding to these problems above, M company has designed two mechanisms: promoting a person interaction between IT department and business department in order to reduce the potential communicating or feedback problems, and openly discussion on the legacy or possible problems in a regular meeting or emergent meeting in order to feedback timely (Shown in Table 4).

Directed by these two mechanisms, IT department has taken many feedback systems, such as different kinds of meeting and “big ears” plan. These feedback systems are designed to deliver information between different persons, such as from the top down to the bottom, from the bottom up to the top or communicating in the same level.
adds some difficulties to our work, which is negative for us to discuss those possible problems.” —Director of Support-Related Data Center

“Our partners (i.e. customer-related product division) are special and some of them know technology well. It’s difficult to capture their demands as we always turn to pure technology discussion and neglect the real nature of business demands.” —Director of Support-Related Product Division

<table>
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<tr>
<th>Designing Mechanisms</th>
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<tbody>
<tr>
<td><strong>Quotations</strong></td>
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<tr>
<td>“We always spend time together and make a person interaction. Sometimes we will go to business department to observe what they are doing, and sometimes we will invite them to offer lessons about business, and sometimes we will play games together or attend parties out of work, which are quite useful for us to understand each other.” —Director of Support-Related Data Center</td>
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<tr>
<td>“At the meeting on Monday, we will discuss every potential topic openly, such as legacy problems at the last week or task planning in the next week. And the potential problems will be discussed and resolved face-to-face in order to avoid unnecessary misunderstanding.” —Director of Support-Related Product Division</td>
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<tr>
<th>Concrete Actions</th>
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</thead>
<tbody>
<tr>
<td><strong>Quotations</strong></td>
</tr>
<tr>
<td>“There is a daily morning meeting for the top tier in our company which will discuss any sharp or tiny change of corporate strategies and important issues in the past day. After the top-tier meeting, our department director will deliver top decisions to us in our own meeting and lead us to look for potential solutions for the problems.” —Director of Support-Related Product Division</td>
</tr>
<tr>
<td>“In order to meet business demands, there will be an emergent meeting to cope with accidental situations between IT department and business department. We also have a weekly meeting on Monday to discuss the potential problems in our work or allocate tasks in the next week.” —Director of Support-Related Data Center</td>
</tr>
<tr>
<td>“We also have a ‘big ears’ plan to collect recommendations or complaints from bottom employees, which is good for us to discover potential problems.” —Director of IT Planning Division</td>
</tr>
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</table>

Table 4 Concrete problems, mechanisms and actions in post-event period

5 DISCUSSION

With business’s fast growing, the IT department in M company is facing many challenges. For example, IT department has to process more than 500 000 orders everyday, which are still rising sharply, bringing many pressures to IT department. In order to improve user experience, IT department has designed many mechanisms to strengthen collaboration. Moreover, along with its expansion, IT department itself needs to communicate and feedback timely. In order to process these challenges, IT department has designed many mechanisms and implemented them through lots of concrete actions, which could be categorized into three periods. And in each period IT department has obtained some special capabilities, which have formed an agile IT capability.

5.1 Pre-event: scientific planning capability

Facing the problems from top tier and business department, IT department has sensed that their biggest problem is how to meet the fast growing business demands; they have designed two mechanisms: improving the predictability to business requirements and applying a scientific task allocation, in order to tackle the huge business demands, and formed a routine of regular discussing meeting for making plans, which are concisely illustrated by Table 2. Based on the information in Table 2, we could find that what IT department has done in this process is directed by the principle “first thing first”.

First thing first is a directing principle in software development and project management (Firesmith 2004; Wiegers 1999), which highlights distinguishing the priorities of different tasks and allocating
them separately. This principle is being used in IT department to direct its daily work. With the business’s fast growing, IT department has to support the corporate strategy and business department by improving its predictability and scientifically allocating different tasks.

In order to implement these mechanisms, IT department has taken many actions directed by the principle “first thing first” through flexible prioritizing on different events. For example, there is a regular weekly meeting in IT department and they always discuss face-to-face to decide which task should be first and which task could be put off a little late, and allocate different priorities to different tasks according to the specific situation. After processing similar situations repeatedly and flexibly IT department has obtained a scientific planning capability.

5.2 During-the-event: improvisation capability

User experience is the critical factor for success e-commerce company. In order to improve user experience, IT department has designed two mechanisms: strengthening collaboration among different subunits and doing team work in each unit, moreover, they also have adopted BI and data analysis, implemented many systems. These mechanisms and concrete actions are all done by improvisation, and the detailed information is shown in Table 3.

Improvisation is a word borrowed from music and seen as one of the key enablers of innovativeness and spontaneity, with traits that are crucial for dealing with the complex, unpredictable, and time-critical issues that are frequently confronted by organizations today (Crossan 1998). Besides of organizational improvisation, there is also collective or group improvisation. Collective improvisation emphasizes that there should be at least two agents interact around a theme or referent, so it may be produced by the joint of activities of individuals who are themselves improvising (Moorman & Minar 1998). The joint of activities produces collective improvisation, which is composed of two parts: each individual should be improvising and different individuals should be cooperating with each other to be improvising around one theme.

In order to improve user experience, M company has designed many systems. Around improving user experience and these specific systems, IT department has implemented them by improvisation. Take business pattern design for example, which is a process flow among different subunits in certain order. So every subunit should be improvising inside firstly by doing team work to prevent the process from being disturbed. Then different subunits should cooperate with each other because business pattern design is a process flow involving every subunit, which means the work in IT department are needed to be done by collective improvisation. As a fast growing enterprise, the work that IT department has done are huge and time sensible, if they couldn’t tackle the problems timely, a tiny problem may evolving into a disaster. So by handling those similar situations repeatedly and timely, IT department has obtained an improvisation capability.

5.3 Post-event: timely feedback capability

Since there is always much uncertainty in IT department’s daily work, i.e., unpredictable demands, sudden demands change, etc, it’s very necessary to communicate and keep feedback fluently. Thus M company has designed a timely feedback mechanism, such as person interaction between IT and business departments, and openly discussion routines in IT department.

As described in Table 4, timely feedback mechanism is very critical to complete daily work in IT department, and many work such as making a plan or implementing those mechanisms for user experience are all relevant to the company’s timely feedback system. Timely feedback is also helpful for M company to accumulate useful knowledge and experience. As a fast growing enterprise, M company has to solve lots of similar tasks or problems. If experience and skills obtained in the past can’t be inherited, the past efforts will be in vain, which is harmful to accumulate organizational knowledge and leverage organizational capabilities (Moon 2011; Zhao et al. 2011). Thus feedback timely to the problems and routinizing the inspiration obtained by improvisation timely are very useful to form enterprise agility (Goh et al. 2010). The daily orders that IT department has to process
is very huge and still keeping rising. Moreover, many staffs in IT department are from other industries and have different business background. If IT department can’t response to the potential problems timely, a tiny problem may cause a disaster. If good experience can’t be inherited and reused in their daily work, IT department will reinvent the wheel every day.

Thus IT department has design and implemented many mechanisms, such as promoting person interaction between IT department and business department and openly discussions in order to settle the communicating problems, which have covered different hierarchies in M company and different units in the same level and provided better support to corporate strategies and business. Directed by these mechanisms IT department has set up many good feedback systems, such as daily morning meeting and weekly Monday meeting. By handling the similar situations repeatedly IT department has obtained a timely feedback capability.

5.4 An agile IT capability

IT department has obtained three different capabilities during their daily jobs, respectively scientific planning capability, improvisation capability and timely feedback capability. Through a reinforced process (if necessary) of “pre-event: scientific planning capability → during-the-event: improvisation capability → post-event: timely feedback capability”, IT department has obtained an agile IT capability, which can be concisely illustrated by Figure 2. The top half in Figure 2 is an illustration of our research which means IT department is able to reach the alignment between IT and Strategy, and the alignment between IT and business through developing and manipulating its IT capability, while the bottom half is a demonstration of the process of how to develop an agile IT capability.

![Figure 2. The process of developing an agile IT capability](image)

The agile IT capability here has the common characteristics of IT capability defined by previous literatures, such as BI systems and elaborate data analysis corresponding to a sustainable and expansible IS systems, person interaction between business department and IT department corresponding to a fusion of IT knowledge and business knowledge, and scientific planning corresponding to a proactive stance of using IS tools (Lu & Ramamurthy 2011). It also has a specific character that is high agility. This character is especially obvious in scientific planning during the pre-event period, improvisation when strengthening collaboration in the during-the-event period, and timely feedback in the post-event period, which is similar to these previous researches that treat agility as an ability to consistently fast response to opportunities or problems in the turbulent environment (Sambamurthy et al. 2003). Thus, taking these characters into consideration, we conceptualize this IT capability as an agile IT capability.

In the bottom half, the phrases (such as improving predictability and applying scientific task allocation, strengthening collaboration and doing team work, person interaction and openly discussion)
are the mechanisms of how to develop different capabilities in the different period, which are mainly from the three tables (Table 2, Table 3 and Table 4) in section 4 and discussions in section 5. However, there is one thing needed to be emphasized. Different from these stable developing companies in which different problems may be arising in different periods, these problems may spring up at the same time in these fast growing companies, i.e. M company. So these three capabilities are not obtained in the order of one after another but may be formed at the same time.

6 CONCLUSIONS

This paper chooses a Chinese e-commerce company M and conduct a single case study to analyze the research question that how is IT capability developed accompanying business’s fast growing, which is not well addressed by previous literatures. Through analyzing how IT department processes varieties of problems rising along with business’s fast growing, we find that M company has designed and implemented many mechanisms in order to tackle the problems caused by business’s fast growing. For a specific problem, what M company has done could be categorized into three periods, respectively pre-event, during-the-event and post-event.

Through planning the whole in the pre-event period, strengthening collaboration in the during-the-event period, and keeping feedback in the post-event, IT department has obtained three capabilities, respectively scientific planning capability, improvisation capability and timely feedback capability, which compose an agile IT capability. This agile IT capability not only has the common characters of IT capability defined by the previous literatures, such as Lu and Ramamurthy in 2011, Peppard and Ward in 2004, but also has a character of high agility enabled by scientific planning during the pre-event period, improvisation when strengthening collaboration in the during-the-event period, and timely feedback in the post-event period. Lastly we summarize a process model to illustrate an approach of how IT capability is formed (shown in Figure 2).

The implication of this paper has three levels. Firstly, we find the gap that how IT capability is developed is not well studied, and address this gap by case study on a Chinese fast growing e-commerce company M, which will be an implement to the literature of IT capability. Furthermore, based on dynamic capability theory, we construct an approach to explain how IT capability is developed by tackling the problems in a turbulent environment, which will rich the studies of IT capability and dynamic capability theory. What’s more, our work also has strong practical implication. Firstly, we dissect a fast growing company; we divide what IT department in M into three periods, and analyze what the problems in each period and their corresponding measures, i.e., different mechanisms, which are the foundation of agile IT capability. To those IT managers in the similar situations, these data are vivid, which will offer much insight to them. Secondly, we offer an example of how a company maintains its fast growing through tackling different changes and obtains an agile IT capability during its developing, and also summarize a process model of how IT capability is formed; our work will help IT managers understanding IT capability better, and also could decrease the mystery of IT capability, which will sheds to IT managers to develop their own IT capability.

There are also some limitations in our paper. First, like many single case studies, the problem of external validity is one of the key limitations as advocated by many researchers (Walsham 2006). Yet, it should be noted that a single case methodology is actually a typical and legitimate endeavour in qualitative research (Goh et al. 2010), so what we have done in this paper has its special implications. Second, our object is an EC enterprise which is much relied on IT or IS resources and may spend more resources on IT infrastructure development than those traditional enterprises, which may make our conclusions less external validity. So if permitted, we will and also hope other scholars to do a comparable research between EC enterprises and traditional enterprises in the future. Finally, we want to explore how a fast growing enterprise develops its IT capability, but our interviewees are all from IT department. Although we have argued the rationality in the section 3, IT department is not the same with the whole company after all. To address this limitation, we contact M company again and wish to plan to do a longitudinal study in the future.
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