# Contributive roles of multilevel organizational learning for the evolution of organizational ambidexterity

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## Abstract

**Purpose** – The purpose of this paper is to reveal how organizational learning at the strategic and operational levels (i.e. strategic learning and business learning, respectively) contribute to the development of organizational ambidexterity along the growth of enterprises from an evolutionary view.
**Design/methodology/approach** – The authors conducted a longitudinal single case study on Huawei – a leading Chinese firm in the telecommunication industry. Data were collected from various sources including interviews, senior speeches, scholarly publications, company magazines and other documents, and was analyzed in line with the principles of grounded theory.
**Findings** – This research reveals that the case company (Huawei) constructed organizational ambidexterity with different foci during different development stages. The organization's ambidextrous capability evolves over time, shifting from one domain to another. Such ambidexterity development was largely beneficial from the multilevel organizational learning at both the strategic level (focussing on the whole organization and long-term goals) and operational level (focussing on local interests and short-term goals).
**Originality/value** – This paper represents one of the earliest works to uncover the ambidexterity building process from an evolutionary approach that requires the collection of longitudinal data. Also, the paper proposes a multi-level learning framework for ambidexterity building in practice. This framework distinguishes strategic learning from business learning and projects the two types of learning into learning at four levels-individual, team, intra-organizational, and inter-organizational, which can be leveraged to guide division of labor among hierarchical levels during the progressive development of ambidexterity.

**Keywords** Organizational learning, Case study, Capacity building, Evolutionary theory
**Paper type** Research paper

## Introduction

A critical challenge faced by enterprises in a turbulent and dynamic environment is organizational ambidexterity, which is how an enterprise balances the need to exploit existing capabilities and search for new ones (Vera and Crossan, 2004). Exploitative

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activities lead to incremental improvements inside the already established organizational routines, therefore they often contribute to an organization's current operational efficiency and ensure the organization with stable short-term profitability (March, 1991). Explorative activities often result in new approaches and ideas deviating from current operations, therefore they can provide an organization with future opportunities and are beneficial for the organization's long-term profitability (March, 1991). It has been found that organizational ambidexterity is positively related to company growth (He and Wong, 2004), technological innovation (Jansen *et al.*, 2006) and financial performance (Gibson and Birkinshaw, 2004).

Despite the strategic importance of exploitation and exploration, enterprises are always faced with the trade-off between the two due to limited managerial attention and scarcity of organizational resources. Single concentration on either side of organizational ambidexterity may bring disaster to an organization, as singular focus on either side leads to overt aggressiveness (Auh and Menguc, 2005; March, 1991). Most organizations are inclined to emphasize exploitation while investing less efforts in exploration. However, this imbalance is potentially self-destructive, because organizations are likely to be trapped in obsolescence and thus lose the chance to lead in future markets (March, 1991). In the same vein, organizations that engage in endless exploration will suffer from considerable uncertainties and finally exhaust their resources (Auh and Menguc, 2005). Thus, it is important for organizations to develop organizational ambidexterity for gaining and sustaining competitive advantage.

Prior research has indicated three ways of organizational ambidexterity: first, structural mechanisms that enable different organizational units to perform separate activities at the same time (Gibson and Birkinshaw, 2004); second, context designs that encourage members to divide their time between conflicting demands under particular systems, processes and beliefs (Gibson and Birkinshaw, 2004); and finally, leadership-based antecedents that stress the responsibility of top management to take care of the tension between exploration and exploitation (Lubatkin *et al.*, 2006). These studies provide important insights that organizational ambidexterity development requires the engagement from multi-levels, including the individual, team, intra- and inter-organizational levels. However, prior studies are mostly dedicated to a single-level analysis, thus, we have little knowledge of how factors at multiple hierarchical levels jointly contribute to the building of organizational ambidexterity. Specific feasible practices across multi-levels have been scarcely discussed (Raisch and Birkinshaw, 2008; Gupta *et al.*, 2006).

Next, considering the lack of a unified framework to interpret the development of organizational ambidexterity in the literature, this research relies on the organizational learning perspective to examine ambidexterity building, since the ambidexterity is a learning process (Huber, 1991). Previous research has shown that organizational learning contributes to the balance between accountability and control (Auh and Menguc, 2005), adaptability and alignment (Gibson and Birkinshaw, 2004), and efficiency and flexibility (Ebben and Johnson, 2005). Learning occurs across multiple levels, in which stakeholders such as top management, work teams, and individual employees, are involved (Raisch and Birkinshaw, 2008). At the strategic level, strategic learning by which top management recognize and interpret the opportunity of disruptive innovations is beneficial for exploration; whereas at the operational level, business learning by which work teams and individual employees assimilate the identified innovations, as well as transform them into organizational routines, is beneficial for exploitation.

Finally, organizational ambidexterity evolves over time, as organizations must continuously adapt to the dynamic environment. Raisch and Birkinshaw (2008) has

pointed out that the existing empirical tests mostly rely on cross-sectional data and have "frequently taken a static perspective of organizational behavior." In fact, organizations have to "continuously reconfigure their activities to meet changing demands" (Raisch and Birkinshaw, 2008). Organizational ambidexterity can be built with different domain foci (e.g. product, market, administration and control domains) (O'Reilly and Tushman, 2013; Voss and Voss, 2013). Seldom can organizations achieve ambidexterity within one snapshot. Thus, a compelling demand is to take a longitudinal perspective to investigate the development process of organizational ambidexterity and examine how organizational ambidexterity shifts from one domain to another.

Taken the above three research gaps into account, this research aims to uncover the building mechanisms of the evolutionary organizational ambidexterity from the organizational learning perspective. Our research framework is drawn on the literature of organizational ambidexterity and organizational learning. We argue that "organizational ambidexterity" may indeed be viewed as a strategic objective, representing the desired "ends" to be achieved via the appropriate "means" or organizational learning processes. Further, we adopt the typology of strategic-business learning (Kuwada, 1998) and unify learning levels with Huber's (1991) four learning sub-processes – acquisition, dissemination, interpretation and organizational memory – to investigate the organizational ambidexterity building over a certain period. In order to fulfill these research objectives, we collected longitudinal qualitative data from Huawei Technologies Co. Ltd (hereafter referred to as Huawei) and depicted its evolutionary path of organizational ambidexterity.

## Theoretical underpinnings

### *Organizational ambidexterity*

Organizational ambidexterity is defined as an organizational capability to simultaneously exploit and explore (O'Reilly and Tushman, 2013). While exploration refers to the capability to search, identify and experiment with new alternatives, exploitation refers to the capability to refine, extend and consolidate existing competences (March, 1991). Single concentration on either side of ambidexterity may lead to a disaster. In practice, a number of organizations, especially incumbents, are inclined to invest more in exploitation. This imbalance is potentially self-destructive, since organizations are likely to be trapped in obsolescence, thus lose the chance to lead in future markets (Gupta *et al.*, 2006). Meanwhile, other organizations, particularly start-ups, emphasize breakthrough ideas more than incremental improvements, which results in endless exploration and inadequate exploitation and eventually leads to resources depletion (March, 1991). Therefore, organizational ambidexterity is proposed as a solution for gaining and sustaining competitive advantage (Raisch *et al.*, 2009).

Organizational ambidexterity can be achieved by efforts from multiple hierarchical levels (Raisch and Birkinshaw, 2008). At the individual level, both senior managers and lower-level employees play an important part. For example, transformational leadership style and paradoxical cognitive mode of senior managers may influence how resources for exploration and exploitation are combined for ambidexterity (Smith and Tushman, 2005). The behavioral complexity, diverse knowledge backgrounds and social connections of lower-level employees enable ordinary individuals to divide time between conflicting demands (Mom *et al.*, 2007). At the team level, team compositions and collaboration mechanisms are proposed as important antecedents for ambidexterity. For example, teams with common prior company affiliations tend to engage in exploitation, while teams with diverse prior affiliations tend to encourage exploration.

A mix of common and diverse prior affiliations is found to be a precursor of ambidexterity (Beckman, 2006). At the intra-organizational level, structural design, organizational culture, context, common vision as well as systems and processes are proposed as potential antecedents (Gibson and Birkinshaw, 2004; Adler *et al.*, 1999). At the inter-organizational level, a number of scholars suggest that outsourcing, strategic alliance and cooperation are beneficial for ambidexterity because they enable access to external resources beyond the organizational boundary, which relieves the stress arising from limited intra-organizational resources and management attention (Lavie *et al.*, 2010).

Despite that extant literature has provided fruitful insights in understanding the phenomenon of ambidexterity, it is inadequate due to a number of reasons. First, prior research ignores the dynamic nature of ambidexterity. It's still unclear how organizations pursue ambidexterity along their evolutionary path. Ambidexterity is essentially a dynamic capability by which organizations "mobilize, coordinate, and integrate dispersed contradictory efforts, and allocate, combine and recombine resources and assets across differentiated exploratory and exploitive units" (Rothaermel and Deeds, 2004). The emergent and idiosyncratic nature of dynamic capability is the essence of organizational ambidexterity. However, current investigations often use cross-sectional data and are lack of a process view (Raisch and Birkinshaw, 2008). Second, previous studies use the term "ambidexterity" without specifying concrete meanings attached to the concept. Consequently, there is a lack of knowledge in how organizations prioritize their pursuit of ambidexterity in different domains (Turner *et al.*, 2013). In fact, ambidexterity is a complex phenomenon since the term "ambidexterity" entails different meanings in different functional domains (O'Reilly and Tushman, 2013; Voss and Voss, 2013). Within the product and technology domain, exploration means to generate new technologies, new products and new production capabilities, and exploitation means to increase revenue by refining or consolidating existing products or technologies (He and Wong, 2004). Within the market domain, market exploration refers to discovering new markets or attracting new customers, and market exploitation refers to increasing the purchase of existing customers (Kyriakopoulos and Moorman, 2004). In terms of the control and administration domain, exploration stresses to replace the original operational routines or management systems, while exploitation stresses to reinforce and optimize existing operational routines (Benner and Tushman, 2003). Third, few studies combine factors from different hierarchical levels to provide a full picture of organizational efforts toward ambidexterity, even fewer studies examine the relationships among these factors (O'Reilly and Tushman, 2013; Raisch and Birkinshaw, 2008). More studies across multiple levels of analysis are needed in order to leverage the available antecedents and to design alternative mechanisms for organizational ambidexterity.

In the present work, we concur with scholars in the dynamic capability and organizational learning fields and argue that ambidexterity is shaped by the co-evolution of learning mechanisms that change, renew, and exploit the knowledge resources of a company (Raisch *et al.*, 2009). In the next section, we will propose a learning framework for ambidexterity based on a solid review on learning levels, sub-processes and outcomes.

*Organizational learning*

The organizational learning perspective, emphasizing both cross-level analysis and dynamic learning sub-processes, has been successfully applied to understand the building mechanisms of various types of capabilities, such as absorptive capacity

(Kim, 1998), dynamic capability (Zollo and Winter, 2002), and IT competency (Tippins and Sohi, 2003). We believe that organizational learning offers a powerful framework to understand the evolution toward ambidexterity.

In terms of learning levels, Kuwada (1998) proposes the strategic-business learning typology. Strategic learning is defined as "learning that improves the strategic capability of the organization and changes the basic assumptions underlying the stable generation mechanism that structures the strategic behavior design process" (Kuwada, 1998). In contrast, business learning is the process through which an organization gains concrete operational knowledge under the guidance of established rules (Zollo and Winter, 2002). Due to the fact that this typology distinguishes learning types based on whether learning follows or deviates current routines, it aligns with other typologies in earlier learning literature, such as second-order vs first-order learning (Kuwada, 1998), double-loop vs single-loop learning (Argyris, 1976) and higher-level vs lower-level learning (Fiol and Lyles, 1985). In the present work, we select the strategic-business learning typology mainly because it is the only typology that acknowledges different learning outcomes as a result of efforts from different hierarchical levels (Thomas *et al.*, 2001). By definition, strategic learning leads to a significant impact over the whole organization and causes long-term revolutionary changes such as new basic assumptions. Therefore, strategic learning is closely associated with leadership style at the senior individual and team level, organizational culture, vision and strategic intent at the intra-organizational level and cooperative relationships at the inter-organizational level. In order to achieve incremental improvements, business learning requires familiarity with specific task requirements and sufficient skills. Thus factors such as working experience, team communication and collaboration at the lower individual and team level as well as working and reward systems at the intra-organizational level are closely associated with business learning (Kuwada, 1998). Moreover, this selected typology is appropriate for the organizational context, while the other aforementioned typologies are more often used for the individual learning context.

In terms of the sub-processes of learning, Huber (1991) outlines knowledge acquisition, information distribution, information interpretation and organizational memory as four basic learning sub-processes. All four sub-processes span multiple levels and apply to both strategic learning and business learning.

Knowledge acquisition is the process that an organization collects or generates knowledge. At the individual and team level, an individual creates knowledge either through entrepreneurial or expert intuition (Crossan *et al.*, 1999). Entrepreneurial intuition refers to the identification of future opportunities, thus is mainly from seniors at the strategic level, while expert intuition refers to past pattern recognition, thus is mainly from staff at the operational level. At the organizational level, activities focussing on future-oriented knowledge such as research and development (hereafter R&D) efforts and market reports are categorized as strategic learning, while activities focussing on consolidating past experiences such as performance reviews and trainings are categorized as business learning (Thomas *et al.*, 2001). At the inter-organizational level, knowledge can be acquired beyond the organizational boundary through strategic alliance, outsourcing and partnerships between organizations. Information distribution enables information to be spread and shared from its source to the whole organization (Huber, 1991). If the distributed knowledge originates from managers at a higher hierarchical level, then the knowledge flows in a top-down manner. If the distributed knowledge comes from persons at a lower hierarchical level or from peers at the same hierarchical level, then the knowledge flows in a bottom-up

or horizontal manner. Mom *et al.* (2007) argue that top-down knowledge flows usually relate to specific functional expertise and the cause-effect relationships between such knowledge and current practices are well-established. Thus top-down knowledge flows are positively associated with exploitation. On the contrary, horizontal and bottom-up knowledge flows span a wide range of expertise and are characterized by unpredictable and unstructured knowledge. Thus they are more likely to trigger novel solutions required by exploration. Information interpretation is the process of generating varied understandings toward organizational events and developing shared conceptual schemes (Daft and Weick, 1984). Controversy and consensus can be developed at the team level through communication and collaboration, or at the organizational level through virtual communities or at the inter-organizational level through knowledge transfer processes between firms. While interpretation in strategic learning focusses on cause-effect relationships, interpretation in business learning focusses on specific operational procedures (Kuwada, 1998). Organizational memory is the process of storing knowledge in culture, social norms, procedures and systems. At the individual level, strategic learning focusses on changes in cognitive modes while business learning focusses on change in behavioral modes (Crossan *et al.*, 1999). At the organizational level, culture and social norms fit in strategic learning, systems and procedures fit in business learning. At the inter-organizational level, organizational memory is embodied in best practices acquired from other firms (Crossan *et al.*, 1999). An organization does not necessarily learn in sequence from knowledge acquisition to organizational memory. Rather, sometimes the four sub-processes simultaneously occur in a single activity and it is difficult to set explicit boundaries between them (Huber, 1991).

We propose that both strategic learning and business learning have Huber's four sub-processes, but with distinct foci. Table I summarizes their differences.

| Learning sub-processes | Strategic learning | Business learning |
|---|---|---|
| Learning levels | Mainly occurs at higher hierarchical levels and has an overall impact on organizations | Mainly occurs at lower hierarchical levels and has a local impact on organizations |
| | Manifested at the senior individual level, senior team level and intra and inter organizational levels | Manifested by ordinary employees' learning at the team and individual levels |
| Knowledge acquisition | Entrepreneurial intuition | Expert intuition |
| | Knowledge from R&D efforts and market reports | Knowledge from performance reviews and trainings |
| | Loosely related knowledge from strategic alliance and inter-firm partnerships | Tightly related knowledge from strategic alliance and inter-firm partnerships |
| Information distribution | Bottom-up and horizontal manner | Top-down manner |
| Information interpretation | Cause-effect relationships<br>Why knowledge | Operational details<br>What and how knowledge |
| Organizational memory | Mainly causes cognitive changes that have global and long-term influence on organizations | Mainly causes behavioral changes that have local and short-term influence on team or individuals |
| | Embedded in systems, structures, strategies and culture | Embedded in best practices and standard operational procedures |

**Table I.**
Differences between strategic and business learning across the four sub-learning processes

*Organizational learning and organizational ambidexterity*

Based on the literature review of organizational ambidexterity and organizational learning, we propose an initial research framework shown in Figure 1, which guides us to collect and analyze large amount of case materials. In this framework, organizational learning is conceptualized as a multilevel construct consisting of strategic learning and business learning. Both types of learning would go through the four sub-processes proposed by Huber (1991), namely, knowledge acquisition, information distribution, information interpretation and organizational memory. Accordingly, organizational ambidexterity is conceptualized as a higher-order construct composed of explorative capability and exploitative capability (Kathuria and Konsynski, 2012). The two components have different concrete meanings in technology, internal management and control, and market domains. The basic contention of our framework is that the four learning sub-processes at the strategic and business levels contribute to exploration and exploitation in technology, internal control and market domains, respectively. More specifically, strategic learning contributes to explorative capability, since the breaking of existing routines and establishment of new assumptions require organizational support and enforcement (Kuwada, 1998). Meanwhile, business learning contributes to exploitative capability, since the consolidation and optimization of existing routines are usually achieved through learning by doing at the operational level. In addition, prior research indicate a positive interaction between strategic learning and business learning under certain conditions (Kuwada, 1998). Similarly, the explorative and exploitative capabilities also interact with each other. However, these interactions are not the focus of this research, therefore, we use dash lines to represent them.

## Methodology

A longitudinal single case study is suitable for investigating the proposed research question for the following three reasons. First, our study is exploratory rather than confirmatory. We aim to uncover how to establish organizational ambidexterity through organizational learning, and case studies are most suitable for answering "how" and "why" questions that are deeply embedded in complex organizational contexts (Yin, 2009). Second, longitudinal data are beneficial to depict the evolutionary footprints of capability building (Walsham, 1995). Finally, a single case study design enables us to delve into the complexity of this problem and generate rich interpretations that may be revelatory to other enterprises (Walsham, 1995). Consequently, we selected Huawei as the focal company, because it has successfully accomplished several major strategic renewals that require the balance of explorative and exploitative efforts, and senior executives of Huawei highlighted the important role of learning efforts from different hierarchical levels.

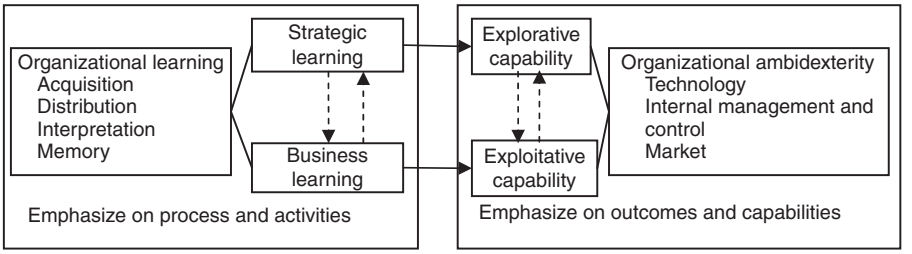


**Figure 1.** Relationships between organizational learning and ambidexterity

Following guidelines of grounded theory, our data collection and analysis were carried out concurrently and iteratively (Strauss and Corbin, 1990). Table II outlines our major activities during the research period from 2009 to 2014. Since we gained access to the case company in 2009, we conducted three initial interviews with its senior managers to collect information about the company's major strategic decisions. Archival data on the company's history, chronicle of events and organizational structure were collected from public data sources such as company websites, public presentation slides and company news. At the first research stage, instead of rushing to the case materials with theoretical lens, we focussed on the raw data and met weekly to share the most impressive events, which triggered further discussion and interpretation toward these events (Miles and Huberman, 1994). From 2011 till 2013, we conducted 15 interviews with managers and ordinary staff from the R&D, human resource and marketing divisions to collect information about their specific learning activities toward exploitation and exploration. Meanwhile, we systematically compiled 21 president's office e-mails, 72 public speeches of the CEO, staff learning notes published in the company's internal newspaper (such as "Huawei People" and "Management Optimization"), and the discussion on key topics posted on the virtual community (i.e. Tiany). These archival data comprised a longitudinal data set that covered the period from 1994 to 2013. During this period, we came to focus on the learning efforts from different hierarchical levels. Each researcher conducted initial coding and axial coding, then we compared and discussed the identified patterns and drafted further data collection and analysis plans. As our understanding toward the company went deeper, the theoretical perspective became shaper (Miles and Huberman, 1994). We finally extracted two learning levels and four learning sub-processes as our theoretical lens. During 2013 and 2014, we confirmed and revised our findings by conducting ten follow-up interviews and sending out 15 surveys to previous

| Research stages | 2009-2011 | 2011-2013 | 2013-2014 |
|---|---|---|---|
| Data sources | 3 initial interviews with senior managers<br>Archival data from company website, public presentation slides, and news report | 15 interviews with managers and ordinary staff<br>Office e-mails<br>72 CEO speeches<br>Internal circulations<br>Virtual community | 10 follow-up interviews<br>15 e-mail surveys<br>Research Memos |
| Data analysis outputs | 3 development stages<br>A chronicle of events<br>Organizational structure | Vivo codes<br>Initial coding<br>Axial coding<br>Memo by events | Manuscript |
| Theoretical focus | General topics such as strategic renewal, innovation | Two learning levels and four learning sub-processes<br>incremental and radical innovation | Ambidexterity in the R&D, internal control and marketing domain |
| Coding examples | E.g. "cultivating vision," "promoting a culture," "direct information flow," "market performance" | E.g. "set personal examples," "culture reframing", "required learning," "autonomous learning," "reveal issues on periodic work review," "set up predefined process," "adjusted team structure," "focus on customer communication," "empowerment" | |

**Table II.**
Data collection and analysis during three research stages

interviewees. These interviews and e-mails also served as a complementary data source to the archival data set, which formed data triangulation and helped the research group to interpret the archival data more accurately (Yin, 2009). We iterated our coding until we arrived at theoretical saturation, where theory, data and proposed model aligned with each other (Strauss and Corbin, 1990). We concluded our case research by writing the case report.

## Case description

Huawei, a Chinese high-tech company in the tele-communication industry, was founded in 1987 with a registered capital of only RMB 20,000 (about $3,000). By 2013, it has surpassed Ericsson and become the biggest telecom infrastructure provider with annual sales reached 39.5 billion USD (see www.huawei.com/cn/). In 2008, the company was honored by *Business Week* as one of "The World's Most Influential Companies" (Mcgregor, 2008).

Based on our case analysis, two turning points were identified to divide the company history into three stages. The first turning point is 1997 when Huawei shifted its emphasis from technology enhancement to management efficiency. The second turning point is 2008 when Huawei shifted its emphasis from internal management to external market opportunities. In the following sections, we will present how strategic learning and business learning processes contributed to the two dimensions of organizational ambidexterity in three distinctive development stages.

### *Stage 1: technology-oriented ambidexterity (1987-1996)*

Huawei started out as a switch agent with only 14 employees. It lacked core technologies and the telecommunications equipment market was dominated by European and American companies.

*Learning processes*. During this period, strategic learning was conducted mainly at the senior individual and team level. Since there was no explicit division of labor among employees, everyone including the CEO, had to assume multiple roles in marketing, delivery and after-sales services. Most employees worked from 8 a.m. to 10 p.m. from Monday to Sunday. In 1989, the CEO shut down the business and risked all resources in R&D for self-developed switches. He explained this decision to all his staff:

> As foreign companies have monopolized the telecommunication industry, domestic companies have to sacrifice market share in exchange for technology. This price is too high to bare […]. If we choose to be an agent, we'll make profits by attaching to the big brands, but we also choose to give up the equal position to compete in future markets […] without independent R&D and breakthrough products, survival for this company will be hopeless, and industrial independence for the country will be unrealistic (Ren, 1994).

In order to achieve breakthroughs in the technology domain, the CEO made a metaphor by applying the concept of "intensity of pressure" in the physics science to the R&D domain. In physics, "intensity of pressure" measures the effect of forces and is defined as the normal force per unit area, while in the R&D domain, it measures the effect of technology exploration and is determined by the amount of resources invested in explorative projects. In the development of C&C08, a large-scale telephone exchange, Huawei allocated almost all technical experts for this project and after several months' hard work, the project team finally came up with a qualified product one month ahead of its competitors. The culture of hard-working and plain-living was heavily relied on to

overcome difficulties posed by technological deficiency and resource shortage. This dedication, as well as Huawei's sharp sense of competition, strong team spirits and self-sacrifice, was referred to as "Wolf Culture" (Low, 2007).

Meanwhile, business learning was carried out at the lower individual and team level to acquire mature technologies. Employees improved operational efficiency through self-training and informal communications. The operational knowledge remained tacit in individuals' memory. A director of the strategic planning department, who is one of the earliest employees and has worked in Huawei for more than 20 years, commented on the company's business learning:

> We have to give up the dream of quick success, chances prefer down-to-earth workers […] we learned the rules of competition through competition […]. Every employee has to squeeze time to conduct self-training […]. We advocate learning by doing. If one is good at summarizing and reflection, one can make bigger progress (Interview transcript, September 2012).

Moreover, employees were encouraged to be role models in their positions. For example, Huawei honored and rewarded employees who significantly reduced production costs, designed best-seller products and even those were efficient at secretarial work.

*Established ambidextrous capabilities*. In the early stage, Huaiwei's ambidexterity was manifested in the technology domain. In terms of technology exploration, the company developed its core technology and products, and transformed from an agent to a producer. Associated strategic learning activities were mainly at the senior individual level. The CEO played a critical role in identifying potential technological opportunities and prioritizing explorative and exploitative efforts. When the organization tended to favor exploitation, he directed organizational attention to independent R&D and breakthrough ideas. Information was spread in a top-down and lateral manner through passionate speeches and informal socialization, such as working and chatting with employees. Knowledge interpretation mainly relied on entrepreneurial and expert intuitions from senior team members. In terms of technology exploitation, the company accumulated hands-on experiences in improving existing technologies and products. Associated business learning were mainly at the lower individual level. Information was acquired, distributed and interpreted through lateral communication such as face-to-face chats and leaderless group discussion. Behavioral modes were shaped by role models. By this stage, organizational memory remained scattered and tacit in individuals.

*Stage 2: management-oriented ambidexterity (1997-2008)*

As Huawei entered overseas markets, senior managers realized that individual heroes and endless overtime work were intolerable in some oversea branch offices and were never sustainable for long-term development. The vice-president of the R&D department, who was among the first to recognize the necessity of transformation, commented that:

> Due to weak technology base, we have wasted a lot of resources in achieving limited R&D improvements, we got other problems like redundant processes, overlapped structures, short-term focused decision making habits […] it's time to import mature management systems such as IPD (Integrated Product Development) to support rational decision-making (Interview transcript, April 2013).

During 1997-2008, Huawei focussed on management optimization with the help of consulting companies including IBM, Hay Group, PwC and SAP. Since the successful

experience of IPD project had helped Huawei introduce subsequent projects such as integrated supply chain and integrated financial system, we here take the IPD project as an example.

*Learning processes*. Strategic learning was carried out at the team and organizational level, aiming to overturn the redundant, inefficient and short-term oriented management routines and establish process-oriented management routines that integrate short-term and long-term goals. In view of internal resistance toward this transformation, senior teams worked out a number of learning principles. For example, many employees complained that the process-oriented R&D procedures contrasted sharply with their traditional master-apprentice procedures, making their current work processes inefficient. Besides, numerous training of the new procedures had caused heavy burden on the R&D staff, which slowed down rather than accelerated their work. The principle of self-criticism were proposed to cope with the resistance. Self-criticism required individuals to criticize their current management practices and prepare an open mind for radical changes. This principle helped individuals become aware of the problems in existing routines and triggered internal motivations for new procedures. A qualified manager in the human resources department shared his understanding of self-criticism with us:

> Self-criticism is the best solution to inertia. Inertia is nothing horrible. It's common. It exists in all organizational levels. We all have inertia, especially when we confront new problems and challenges. However, we need to realize that it's impossible to solve the problem by one step. We have to refresh ourselves by self-criticism, learn from our own reflection and make progress step by step (Interview transcript, 2013, human resource manager).

A learning principle named "ossify, institutionalize and optimize" was also proposed to ensure system implementation. It emphasized that the IPD system should be accepted uncritically at first because customization was based on comprehensive understanding. If adjustments and revisions were made at the beginning of implementation, the organization might lose the chance to appreciate the real impact of the intact system. Although these principles for system implementation were eventually enacted by senior managers, the formulation and interpretation took place in cross-functional teams. An "observer" and an "operator" were selected from each department to form the cross-functional teams. Once "observers" passed the training of consultants, they would join another cross-functional team and act as "operators." Thus the transformational idea spread to other organizational members in a more controlled and accurate way. Organizational memory was precipitated in "Huawei Basic Law" that addressed standardized operating procedures and concerted actions.

Business learning was carried out to consolidate the transformation triggered by strategic learning. Typical learning activities included implementing the principle of "self-criticism" among lower-level individuals and teams, initiating "periodic work review" in all hierarchical levels and producing internal publications to share best practices. Self-criticism urged employees to get rid of complacency and metal inertia, which helped Huawei make subsequent adjustments step by step. When this principle was applied at the team level, it became "periodic work review," where team members criticized their own recent work, exposed problems and came up with potential solutions. Huawei rewarded members who shared their observation, interpretation and reflection on internal publications like "Huawei People" and "Management Optimization." Besides, employees were also rewarded if they attended training courses in "Huawei University," a sub-division dedicated to collecting best practices and providing trainings courses.

*Established ambidextrous capabilities*. In terms of management exploration, the casual and human-centered decision-making process was replaced by a rational and system-centered process, where management systems were leveraged to identify, seize and implement novel opportunities and more comprehensive information was used as input for improving existing products and services. Associated strategic learning were mainly performed by cross-functional teams. The information dissemination process stood out among other learning sub-processes to ensure adequate understanding and cognitive changes. In terms of management exploitation, the internal control and administration processes become more efficient. In contrast with the reliance on autonomous learning at the individual level at stage 1, business leaning at stage 2 relied more on predefined regulations and processes at the organizational level. Besides, business learning emphasized the organizational memory process which encouraged tacit individual knowledge to be codified as explicit organizational knowledge.

*Stage 3: market-oriented ambidexterity (2009 till recent)*

As Huawei became more active in the international markets, the standardized management system was too rigid to cater to changing local demands. Consequently, the organizational structure, process and culture were challenged again by the market-centered strategy.

*Learning processes*. Strategic learning was evident in the change of organizational structure. In 2008, a project team in the North African market failed a government bid despite its intense effort. After months' reflection, the project team reported that their misunderstanding of customer needs, slow decision making and long approval processes were the root causes of this failure. They proposed a high-quality product but ignored their customers' particular demand on cost reduction. Different customer representatives had made inconsistent promises. Worse still, they failed to deliver promised products on time. This project team then formed "the iron triangle combat unit," which consisted of a customer manager, a product expert and a delivery professional. The customer manager was responsible for collecting accurate customer needs, the product expert took care of the customized and all related technical details, while the delivery professional fixed problems during installation. This new structure ensured clear division of labor and empowered frontier employees to leverage organizational resources, thus enabled accelerated decision making and approval processes. By 2009, the North African team had successfully gained several government bids. During a senior work review, the CEO thought highly of this new structure, but he also emphasized that spreading the new structure to the entire organization requires employee training programs, an open culture and more collaborations with external organizations:

> The new structure signals our transformation from a technology-oriented firm to a customer-oriented one. The tenet of Iron triangle is to fulfil tasks responsively and with high quality. It may exist in all processes. However, changes in the frontier marketing team is not enough, we need to align the whole management office, such as culture and training systems with our market-oriented strategy. All administration work serves to provide support rather than control to the frontier teams (Ren, 2009).

The new marketing structure triggered radical changes including more external partnerships, systematic training programs and an "openness, compromise and grayness" culture[1]. Partnerships enabled a larger resource pool. By the end of 2009,

Huawei had established 36 training centers and 17 joint innovation labs (see 2010 annual report of Huawei, p. 48). Training programs at the organizational level improved the expertise of frontier employees. For example, customer managers sharpened their expertise in negotiation skills; product experts were trained to be more capable of finding help from other organizational members; and delivery professionals were trained to make emergency plans. The "openness, compromise and grayness" culture exposed the company to more opportunities, reduced the resistance for radical changes, and thus enabled the company to stay firm in the right direction of transformation. Based on efforts from the senior manager, project team, frontier employees as well as consultants, Huawei quickly redesigned its empowerment mechanisms and made adjustments to its incentive systems.

Business learning occurred to reinforce the new practices by making appropriate adjustments under various contexts. Most learning sub-processes were initiated by ordinary employees. The "Iron triangle unit" from the North African market was spread to other markets with different cultures. And this practice was replicated in various functional departments beyond marketing. Periodic work reports across all hierarchical levels, internal publications and self-criticism were still used as information distribution channels. But by this stage, the direction of information flows became more diverse.

*Established ambidextrous capabilities*

In terms of market exploration, the company overturned its technology-oriented strategy and established a market-oriented strategy by altering its structure, processes and culture. Associated strategic learning was inspired by ordinary employees at the market front rather than senior managers at the rear. In terms of market exploitation, the company improved customer satisfaction in existing markets. Associated business learning was increasingly carried out by lower-level employees. The resultant customer-centered structure and open culture allowed quick configurations of resources to fulfill both emerging and existing customer demands. Ambidexterity was embodied in the market domain.

## Discussion

Based on our case analysis, we depicted the ambidexterity building path for the focal firm in Figure 2. We discussed the findings as follows.

First, the case company prioritized ambidexterity in different functional domains and approached domain-specific ambidexterity differently based on its resource availability, management experience and strategic objectives. In pursuing technology-oriented ambidexterity, Huawei lacked financial and human resources as well as management experiences, it heavily relied on individual efforts in pursuing exploitation and exploration. Senior managers allocated resources to emerging technologies and encouraged individual employees to explore new technological opportunities, whereas ordinary employees learned from role models and hands-on experiences.

In pursuing management-oriented ambidexterity, with better financial conditions and operational knowledge, Huawei relied on management systems that not only facilitated individual procedures for exploitation and exploration but also enabled the systematic integration of the two. Since the effectiveness of these mature management systems had been tested by leading companies, the case company focussed on changing cognitive and behavioral habits and internalizing the management

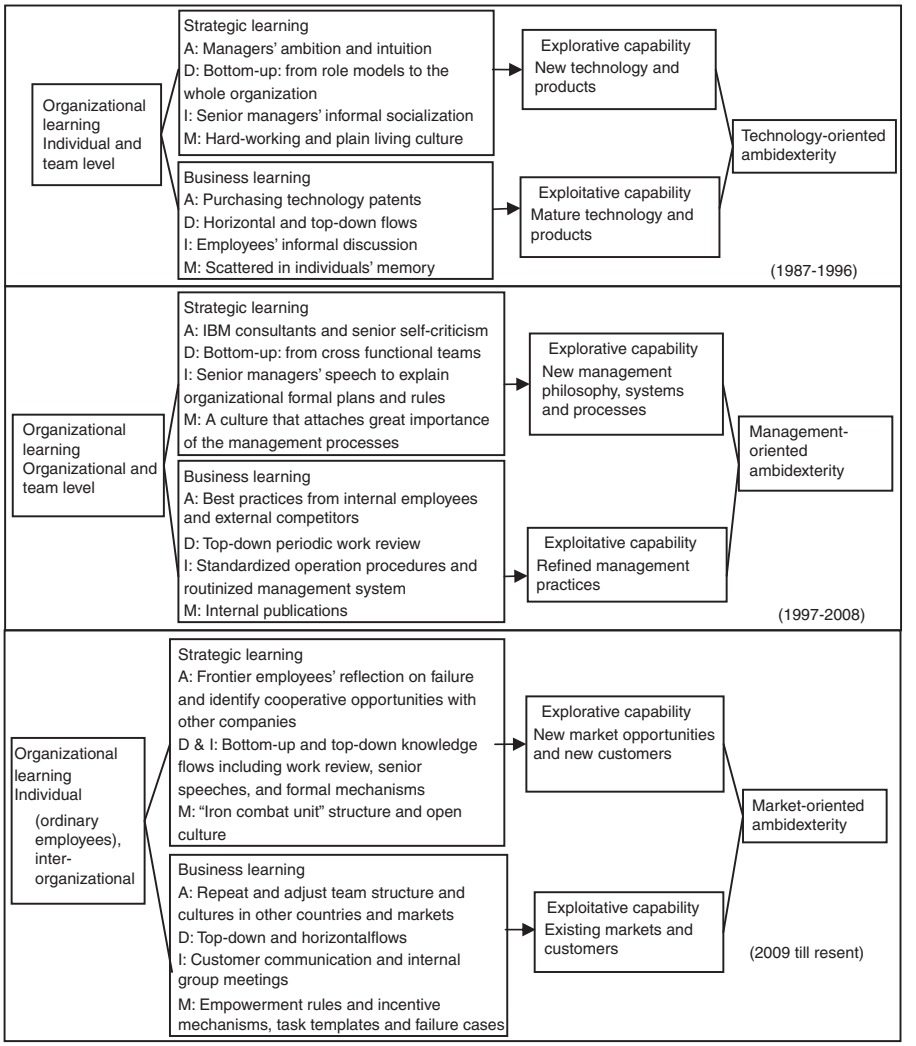


**Figure 2.**
An evolutionary map of organizational ambidexterity building

**Notes:** "A", "D", "I", "M" letters are four sub-processes of organizational learning. A, acquisition; D, distribution; I, interpretation; M, memory

philosophy embedded in these systems via strategic learning and business learning at the team and organizational levels. This is similar to the structural approach proposed in the ambidexterity literature, in which exploration and exploitation are separated by different routines and are integrated by management oversights (Siggelkow and Levinthal, 2003).

In pursuing market-oriented ambidexterity, Huawei emphasized the "openness, compromise, and greyness" culture, which means maintaining an open attitude to various opinions and making concessions on details. It encouraged individuals to change mindsets and develop the cognitive and behavioral complexity required by

ambidexterity. This approach embodies features of contextual approach in the ambidexterity literature (Gibson and Birkinshaw, 2004). Strategic and business learning relied on efforts across all organizational levels, especially from the frontier employees. It's easy to notice that the strategic goal of Huawei shifted from survival to competitive advantage and sustainable development, which is increasingly long-term oriented.

Second, although Huawei changed its ambidexterity focus along its development path, ambidexterity building was an accumulative process. For instance, the technology-oriented ambidexterity was not emphasized only at the initial stage, but was stressed throughout Huawei's history. To some extent, the evolutionary path of Huawei supports that ambidextrous market expansion is based on ambidextrous products and ambidextrous internal control processes. This finding conforms the multi-faceted conceptualization of organizational ambidexterity which demands deliberate learning processes (O'Reilly and Tushman, 2013).

Third, the different facets of ambidexterity in each stage (technology, internal management and marketing) were all achieved through strategic learning and business learning, but learning activities at different stages rely on efforts from different hierarchical levels. Technology-oriented ambidexterity at stage 1 relied on learning at the individual and team levels, since the limited technological knowledge and scarcity of financial and human resources forced its staff, especially the senior managers, to assume multiple roles (Gibson and Birkinshaw, 2004). Besides, breakthrough innovations in the R&D domain were highly dependent on tacit knowledge from individuals (Mascitelli, 2000). Management-oriented ambidexterity at stage 2 relied on learning at the team and organizational levels. This is because as the company accumulated more experience, individual efforts reached its limits in managing large amount of management practices, which constrained scale expansion of the company. Besides, organizational inertia and individual decision bias tended to favor exploitation of existing practices but ignore or avoid risky transformation of existing procedures (i.e. exploration). Learning processes at the organizational level such as building common vision, designing incentive systems and consolidating best practices were essential to arrive at consensus and concerted actions among different sub-units (Jansen *et al.*, 2009). Marking-oriented ambidexterity at stage 3 relied on learning across the individual, team, intra-organizational and inter-organizational levels. Inter-organizational mechanisms were added because the company had significantly improved its competition position, which enabled better access to external resources. Also, gaining new customers in the market demanded responsiveness and agility (Kyriakopoulos and Moorman, 2004), which required collaboration across all hierarchical levels: Lower-level employees reflected on their failures and developed a new team structure; senior managers promoted this organizational structure and called for an open and tolerant culture; team-level discussion served to refine action plans, and organizational mechanisms ensured empowerment and incentive policies. We may conclude from the case company that resource endowment (including knowledge, financial, human resource and other tangible resources), management capability, competition position and the company's strategic intent determined the relative importance of efforts at each hierarchical levels. This finding affirms that resource endowment, firm scope and market orientation are important moderators for ambidexterity (Raisch and Birkinshaw, 2008), but we offer further insights on their moderation effects in different functional domains.

Fourth, each of the four learning sub-processes relied on efforts from different hierarchical levels across the three stages. Knowledge acquisition initially relied on

ambidextrous seniors and role models, then relied on cross-functional teams and rigid organizational processes, and finally relied on frontier employees and inter-organizational cooperation. The sources of knowledge also shifted from internal individual experience, internal organizational practice to external customer relationships. At first, the information was disseminated horizontally though informal socialization among employees, then the information was distributed in a formal top-down manner based on organization mechanisms, and finally the direction of information mixed the bottom-up and top-down manner by encouraging empowerment. Information interpretation initially relied on senior managers, then relied on cross-functional teams and finally incorporated the efforts from frontier employees. Changes in organizational memory were embodied in organizational strategy, culture, structure and processes (Li Sun, 2009).The strategy shifted from technology enhancement, management optimization, to customer relationships. The culture shifted from "hard-working" to "standardized routines" to "openness, compromise and greyness." The structure transformed from a loose hierarchical structure to a rigid matrix structure, and finally to a customer-oriented platform structure. A number of best practices and operation templates were added to the organizational memory.

## Implications

### *Theoretical implications*

Our study has theoretical implications for the ambidexterity and organizational learning literature. First, it contributes to the literature of organization ambidexterity by taking an evolutionary approach to illustrate an organization's capability building. We illustrate an evolutionary path of the organizational ambidexterity development of Huawei, in which its ambidextrous capabilities shift from one domain to another over time based on the organization's strategic positions, resource endowment and management capability at different stages. Such a result consolidates that the development of organizational ambidexterity is dynamic and an organization's capability building is accumulative (Raisch *et al.*, 2009).

Second, we affirm the notion that ambidexterity requires efforts from multiple levels (Turner *et al.*, 2013). The similarity across the three development stages reveals that ambidexterity in the technology, internal management and marketing domains is achieved through combining strategic and business learning activities. But at different development stages, the organization relies on efforts from different hierarchical levels (i.e. the individual, team, intra-organizational and inter-organizational levels) and different sub-learning processes. At the initial stage, individual ambidexterity was "pushed" by competition and mainly served to ensure short-term survival, while at later stages premeditated ambidexterity was "pulled" by a clear strategic intention and could be counted for long-term viability.

Third, our research sheds light upon the complementary relationship between exploration and exploitation. In the Huawei case, we find that exploitation benefits exploration when there is adequate prior knowledge, slack organizational resource, and reasonable empowerment for organizational members. Accumulated prior knowledge serves to make better predictions of future trends and enables better interpretation and assimilation of new knowledge (exploration) (Cao *et al.*, 2009). Slack resources allow the company to tolerate risk and experiment with new opportunities. Reasonable empowerment encourages employees to act more proactively, which increases the probability of coming up with creative tension resolutions (Kyriakopoulos and Moorman, 2004). Exploration also benefits exploitation because the novel knowledge from

exploration can be applied to refine current practices (exploitation). For example, in the Huawei case, the new structure ("Iron Triangle" team structure) and open culture resulted from exploration at stage 3 facilitate a deeper understanding of existing customers.

Fourth, we contribute to the learning literature by combining two types of learning (i.e. strategic learning and business learning) and four sub-processes of learning (i.e. knowledge acquisition, information distribution, information interpretation and organizational memory) to form a learning framework for ambidexterity. This framework is useful to reveal the concrete activities performed by the case company.

*Managerial implications*

Our study also provides valuable advices for managers. First, organizational ambidexterity development is a dynamic process rather than a one-shot configuration. Managers need to think strategically and learn to prioritize ambidextrous goals in different domains. Besides, during a specific development phase, the organization should maintain a relative stable and consistent pursuit. Our research demonstrates that the case company sequentially pursued ambidexterity in the domains of technology, management and marketing. It is worth noting that at different developmental stages organizations may rely on the learning efforts from different hierarchical levels to balancing conflicting demands. Thus, managers should improve their ability of integrating talents and intellectual capitals from multiple levels and effectively allocate resources in organizations.

Second, managers should distinguish strategic learning from business learning, since the two learning types play different roles in building ambidexterity. Strategic learning helps companies to rethink the existing operations and form new assumptions, structures and interpretations, while business learning refines and consolidates existing practices.

## Conclusion

In the present work, we attempt to understand how efforts at different hierarchical levels contribute to the dynamic and accumulative process of ambidexterity building. We collected longitudinal data from a revelatory Chinese case and depicted its evolutionary path across three stages. We interpret the dynamic and complex capability building process from the multi-level organizational learning perspective. Our in-depth case study shows that the case company sequentially pursued technology-oriented ambidexterity, management-oriented ambidexterity and market-oriented ambidexterity based on its resource empowerment (including prior experience, financial and human resources), competition position, management capability and strategic intent. By making comparisons across the three stages, we conclude that ambidexterity relies on joint efforts from strategic learning that focusses on overall impact and long-term goals, and business learning that focusses on local impacts and short-term goals. Although both types of learning go through the four learning sub-processes, i.e., knowledge acquisition, information dissemination, interpretation and organizational memory, they are manifested at different hierarchical levels at different development stages. As a result, ambidexterity in different domains relies on efforts from different hierarchical levels and emphasizes different learning sub-processes.

Several limitations have to be admitted in this research. The first limitation roots in the research method of single case study. Even though the specificity of the case

company may limit the generalizability of our findings (Eisenhardt, 1989), we believe this research copes with essential management problems and brings new thinking on the ambidexterity construction topic. In the future, we plan to conduct multiple case studies based on this preliminary single case study. The present work serves as a guidance for our further theoretical sampling. We may be able to confirm, revise or identify moderators for our current findings. The second limitation is the insufficient examination on the interaction effects between exploration and exploitation. Since the evolutionary footprints and concrete learning activities during each stage are the focus of this study, we only show some surface level discussion on the complementary relationship between exploitation and exploration. The interactive relationship between exploration and exploitation has attracted much attention. Some studies have found that the two distinguished capabilities may not always compete for resources and can co-exist to reinforce each other (Crossan and Berdrow, 2003). Thus, the complementarities of exploration and exploitation is a promising future research direction.

## Note

1. "Openness" means to proactively learn from partners outside of the company, to find new objectives, and to enable genuine self-reflections. "Compromise and grayness" means to abandon the absolute right/wrong criteria and to stay harmony with various conflicting opinions.

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## Appendix. Interview protocol

Part I: background and purpose questions:

(1) Can you share your working experience in Huawei?

(2) What major changes Huawei had experienced since its foundation?

Part II: experience questions:

(3) Were there any occasions when it was challenging for the organization to overturn and consolidate existing routines at the same time? What difficulties and challenges did Huawei experience to satisfy both demands?

(4) How did Huawei cope with these difficulties and challenges? What learning practices did Huawei conduct? What were the roles of senior managers, middle managers, and ordinary employees? What benefits did the company gain from the ambidextrous capability building?

(5) How did the employees at different hierarchical levels communicate across levels?

(6) What were the management and resource conditions when the company tended to balance exploration and exploitation? What were organizational culture, strategy, and vision? How did employees adapt to the strategic changes of organizational structure, culture and goals?

Part III: closing questions:

(7) What are the critical factors that help Huawei to achieve remarkable progresses in the technology/internal management/marketing domains?

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