The mechanism between the evolution of cognitive logics and entrepreneurial opportunities: A longitudinal comparative analyses of two cases

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Abstract

Although the discovery/creation of entrepreneurial opportunities are extremely important, the process of analysis, evaluation and screening of the ideas cannot be ignored. This study selects two companies from China as case to explore the mechanism between the evolution of cognitive logics and entrepreneurial opportunities. We find that the entrepreneur/entrepreneurial team will pay attention to the innovation, consensus and practicality of ideas, and the cognitive logics using different knowledge structures in the evaluation of ideas include three types of, i.e., single, parallel and natural, logics. Finally, this explores the deeper reasons for the mutual transformation between discovery opportunities and creation opportunities.

Keywords: Entrepreneurship, Cognition, Cognitive logic, Entrepreneurial Opportunities, Mechanism

Introduction

In the 1990s, the study of entrepreneurial personality encountered a bottleneck, so some scholars introduced the relevant research on cognition in the field of psychology into the field of entrepreneurship. Since then, the focus of entrepreneurial research has gradually shifted from “what are the characteristics of the entrepreneur/entrepreneurial team” to “what is the decision-making and behavior process of the entrepreneur/entrepreneurial team” (Shaver & Scott, 1992; Palich & Bagby, 1995; Busenitz & Lau, 1996; ). Shane and Venkataraman (2000) pointed out that opportunity is the focus of entrepreneurial enterprises, which has the core issue of entrepreneurship research. The recent literature discussed the discovery/creation, decision-making, and behavior processes of the entrepreneur/entrepreneurial team around entrepreneurial opportunities (Mitchell et al., 2002; Mitchell et al., 2011). Thereafter, entrepreneurial cognition has become the core topic of entrepreneur research (Mitchell et al., 2007), and a research framework has been gradually
formed with "context-thinking-behavior" as the core (Groves et al., 2011; Mathews, 2016; Chlosta & Welter, 2017; Walsh & Elorriaga-Rubio, 2019).

Cognition, in the field of psychology, is regarded as the process of information processing and the form of information representation (Bandura, 1991). When comparing the differences between entrepreneurs and non-entrepreneurs, Baron (1998) proposed that entrepreneurial cognition is the difference between counter-factual thinking, attributional style, plan fallacy, and so on. Mitchell et al. (2002) further proposed that entrepreneurial cognition is the knowledge structure that the entrepreneur/entrepreneurial team uses to evaluate opportunities and make decisions (Westhead et al., 2005). In the process of starting and building a new business, the entrepreneur/entrepreneurial team will evaluate the innovation, consensus, and practicality of the original ideas formed by entrepreneurial opportunities (Mitchell et al., 2011; Gielnik et al., 2012; Stinchfield et al., 2013; Kier & McMullen, 2018; Clausen, 2020). Due to the influence of internal and external factors, not only will the knowledge structure of the entrepreneur/entrepreneurial team change (Smith & Semin, 2004; Thomas et al., 2019), but also the order of the knowledge structure will change when used to evaluate the above three aspects of an idea in different stages of the entrepreneurial enterprise development. This paper refers to the sequences in which the entrepreneur/entrepreneurial team uses different knowledge structures when evaluating ideas as the cognitive logics.

When the cognitive logics are different, the purpose, agility, and process of dealing with ideas will also be different. The existing literature focuses on the way that ideas are generated (Bodde, 1942; Flynn et al., 2003), the factors that affect the formation of the ideas (Amabile, 1983; Puccio, 1999; Perry-Smith & Shalley, 2003), and the ideas that are beneficial to the firms (Brown, 2008; Kier & McMullen, 2018). However, identifying ideas that can form usable entrepreneurial opportunities is more important for the development of entrepreneurial enterprises. Due to the changes in the market environment and the development of the entrepreneurial enterprises themselves, the requirements of enterprises for entrepreneurial opportunities are also dynamically changing (Buenstorf, 2006; Foss et al., 2013), and, hence, the processes and criteria for entrepreneurial enterprises to choose ideas are also dynamically changing. Therefore, this work will also explore the evolutionary process of cognitive logics, i.e., the evaluation procedure of ideas to clarify the screening processes of ideas that support the formation of entrepreneurial opportunities at different development stages of the entrepreneurial enterprises.

The current research on entrepreneurial opportunities believes that discovery opportunities and creation opportunities can be transformed through an opportunity set (Zahra, 2008; Zahra & Nambisan, 2011), but some scholars have suggested that this transformation must be completed under certain context (Overholm, 2015). The formation process of entrepreneurial opportunities is inseparable from the support of ideas (Vogel, 2017). It is possible for entrepreneurial enterprises to retain ideas that previously have the characteristics of discovery opportunities and creation opportunities under certain contexts, thereby opening the prelude to the mutual transformation of the two types of opportunities. This work will further explore the way that cognitive logics interact with entrepreneurial opportunities to analyze the deeper reasons for the mutual transformation of the two types of opportunities.

This work takes the entrepreneurial processes of two Chinese entrepreneurial enterprises as the objects of case studies to explore the mechanism between the evolution of entrepreneurial cognitive logics and entrepreneurial opportunities. This study mainly makes the following three main theoretical contributions to the current literature. First, the existing studies propose that entrepreneurial cognition is a knowledge structure that an entrepreneur uses to evaluate opportunities and to make decisions (Mitchell et al., 2007). This work further clarifies the roles of entrepreneurial cognitions in the processes of analysis, evaluation, and selection of ideas. Second, entrepreneurial enterprises generally determine the value of an idea by evaluating its innovation, consensus, and practicality (Mitchell et al., 2011; Kier & McMullen, 2018; Camelo-Ordaz et al., 2020). This work finds that entrepreneurial cognitions will adopt different knowledge structures and logical orders in evaluating the above three aspects, and the entrepreneurial enterprises analyze, evaluate, and select ideas under different cognitive logics with different speeds, processes and, purposes. Finally, the existing literature believes that opportunities for discovery and creation can transform into each other in
a certain context (Welter & Alvarez, 2015) and can coexist simultaneously in entrepreneurial enterprises (Zahra, 2008). This work finds that the essences of this transformation are that different types of ideas inherit some of the characteristics of the opportunities previously used by the entrepreneurial enterprises in the process of formation and that these characteristics are retained after the opportunities are formed. Thus, if only from the perspective of the opportunities, the mutual transformation is between discovery opportunities and creation opportunities based on the opportunity set.

Theoretical Background

Entrepreneurial cognition

Cognition can be used to explain how managers shape organizational responses in routine work (Eggers & Kaplan, 2013), and, furthermore, how managers develop corresponding organizational capabilities to cope with emerging opportunities and threats through their understanding of the external environment (Lorsch & Lawrence, 1967). Cognition is also able to answer why some entrepreneurial enterprises succeed and others fail (de Mol et al., 2015). Baron (1998) proposed that entrepreneurial cognition is the difference between entrepreneur and non-entrepreneur in counterfactual thinking, attribution style, plan fallacy, etc. On the basis, as Shane and Venkataraman (2000) put forward, that the core issue of entrepreneurship is to make good use of opportunities, Busenitz et al. (2003) further interpreted that entrepreneurial cognition was the knowledge structure owned by an entrepreneur in the process of discovering opportunities and creating new goods or services. Mitchell et al. (2002, 2004, 2007) thought that entrepreneurial cognition was the knowledge structure that an entrepreneur uses to evaluate opportunities and make judgments and decisions in the growth of the entrepreneurial enterprises, and Gregoire and Shepherd (2012) suggested that cognitive differences among entrepreneurs will lead to the different quantity and quality of entrepreneurial opportunities. These scholars intrinsically said that entrepreneurs have different knowledge structures. Thus, entrepreneurial cognition is essentially a knowledge structure of the entrepreneur/entrepreneurial team.

In the initial stage of building a business, the entrepreneurial team members have different interpretations of the external environment due to the differences in their gender, age, educational background, work experience, social status, social network relationships, and so on (Zheng, 2012; de Mol et al., 2015). Consequently, how the entrepreneurial team members reach an agreement and strive for the same opportunity is extremely important for the survival and sustainable development of the enterprise in the future in this context. With the development of the start-up and the gradual familiarization of the internal members, the members of the entrepreneurial team will gradually converge on what changes are in the external environment and how the organization should respond (Foss et al., 2008; de Church & Mesmer-Magnus, 2010). This convergence enables the entrepreneurial team to quickly accept and respond to ideas that previously required a certain procedure to recognize and respond promptly.

Big data, intelligent manufacturing, mobile and Industrial Internet, cloud computing, etc. are gradually integrated into the routine production and operations of entrepreneurial enterprises (Cenamor et al., 2017), and also provide a broader space and huger challenges for the development of them (Nambisan, 2017). At the same time, the combination of data and the cognition of the entrepreneurial team has greatly improved the speed, breadth, and depth of cognition, and promoted the entrepreneurial team to make decisions based on the results of data analysis and prediction (Dremel et al., 2017). The entrepreneurial enterprises are beginning to pay attention to subtle changes in consumer demand and take into account cross-border rivals and opportunities that are irrelevant but will affect the survival of the company (Lau et al., 2004). At the same time, with the assistance of digital technology, the entrepreneurial team will abstract a large number of ideas suitable for entrepreneurial enterprises from big data, laying the foundation for the entrepreneurial enterprises to seize opportunities with strategic value potential in future development.
Cognitive logics

The entrepreneur/entrepreneurial team makes full use of the imagination to find new creative points to create a new venture (Suddaby et al., 2015). They would reason, deduce and evaluate different ideas based on their knowledge, previous experience, and context (Isaksen et al., 2010), and follow certain procedures to turn ideas into opportunities that startups can use.

While it is extremely worth choosing the suitable ideas to create a new venture (Kier & McMullen, 2018), the generation of the suitable ideas requires the creative imaginativeness to provide the source (Eckhardt & Shane, 2003), the social imaginativeness to confirm the degree of support (Galinsky et al., 2008), and the practical imaginativeness to assess the feasibility (Miščević, 2018). Kier and McMullen (2018) believe that imagination itself is a cognitive capability to predict the future. However, cognition has not only a predictive role but also more importantly a role in the analysis, evaluation, and selection of ideas through the perception and response to the external environment in the process from the emergence of ideas to the use of entrepreneurial opportunities (de Mol et al., 2015).

The entrepreneurial team needs to further evaluate the ideas that appear within the entrepreneurial enterprises (Dean et al., 2006). Those ideas that meet the expectations of the pioneer enterprise in terms of innovation, consensus, and practicality can be retained to form the opportunities that the entrepreneurial enterprise can take advantage of (Basadur et al., 1982; Perry-Smith & Mannucci, 2017). Along with the development of the entrepreneurial enterprise, the number of ideas within the entrepreneurial enterprise continues to increase (Girotra et al, 2010), the requirements to evaluate ideas faster continue to change (Blohm et al, 2011), and the criteria and purpose of idea screening will also change (Giones et al., 2013). The entrepreneurial team will analyze, evaluate and select ideas in different orders of the knowledge structure at different stages of the entrepreneurial enterprise development. Therefore, different cognitive logics not only select and evaluate ideas at different efficiency but also have different procedures in converting the ideas to entrepreneurial opportunities.

Entrepreneurial opportunity

Shane and Venkataraman (2000) initially introduced the concept of opportunities into the entrepreneurial field, and expounded that the establishment of a new venture is the process of introducing new goods, services, raw materials, etc. on the basis of innovation, and then integrating them to create outstanding value. The current research on entrepreneurial opportunities can be divided into the views of discovery and creation (Martin & Wilson, 2016). Some scholars believe that the two views are opposite to each other (Fletcher, 2006; Buenstorf, 2007), but others, as the ones represented by Zahra (2008), suggest that the discovery opportunities and creation opportunities can be transformed into each other in a certain context (Overholm, 2015; Welter & Alvarez, 2015).

The view of discovery, based on the Austrian School of Economics, believes that individuals with certain characteristics can find opportunities that exist objectively in the market (Alvarez et al., 2013; Suddaby et al., 2015), and the emergence of these opportunities is caused by the mismatch between supplies and demands in nature (Eckhardt & Shane, 2003). The view of creation considers that an opportunity is the social construction process in which the entrepreneur/entrepreneurial team gives full play to their subjectivity and is affected by many factors such as innovation, social network, and personal emotion (Alvarez & Barney, 2007; Vaghely & Julien, 2010; Korsgaard, 2013).

At the beginning of the establishment of the entrepreneurial enterprises, due to the constraints of resources, networks, capabilities and, other aspects (Terpstra & Olson, 1993; Cai et al., 2016), most of the entrepreneurs/entrepreneurial teams can only use the opportunities that exist objectively in the market. At the same time, the entrepreneur/entrepreneurial team must follow certain cognitive logic to reduce the cognitive differences among individuals, so that the initial ideas can be turned into opportunities that the entrepreneurial enterprises can use. With the development of entrepreneurial enterprises, ideas will appear faster and faster, and the number of ideas that need to be processed will increase quickly (Blohm et al.,
The cognitive logic will change to some extent for the sake of more flexibly processing all kinds of ideas in the entrepreneurial process for selecting ideas meeting the needs of the firms. This change provides conditions for transforming ideas into opportunities and for continuously accumulating opportunities to form an opportunity set. At the same time, the opportunities in the opportunity set disappear, reborn, and iterate with the continuous emergence of ideas. Compared with the beginning of the establishment, entrepreneurial enterprises will have abundant resources, diversified networks, and excellent capabilities after a period of development (Zahra et al., 2006). They can use the opportunities in the opportunity set with the direction of the development of the firm, or use the conceptualization, objectification, and implementation of opportunities hidden deep in the opportunity set to inject new vitality into the development of the firm.

Research Methodology

The reasons for this work to choose the research method of comparative analyses of longitudinal double cases are given as follows. First, this work aims to answer the "how" questions, i.e., "how the cognitive logics evolve during the development of entrepreneurial enterprises, and how the mechanism works between different cognitive logics and entrepreneurial opportunities" (Eisenhardt & Graebner, 2007). This research method is beneficial for researchers to clarify, reveal and understand the essence of the evolutionary process and the driving forces of the evolution (Benbasat et al., 1987).

Second, based on the cognitive theory, the opportunity set is used to reveal the action mechanism between entrepreneurial enterprises in different development stages and entrepreneurial opportunities from the perspective of cognitive logic, to fill the relevant gaps in the cognitive theory. The case study method is effective in constructing a new theory or infilling/pulling the original theory (Eisenhardt, 1989).

Finally, case studies allow researchers to investigate interesting phenomena in a certain context (Eisenhardt & Graebner, 2007), while double-case comparative analyses can appropriately reduce the particularity brought by cases and form mutual confirmation so that the research conclusions have better external validity. At the same time, the goal of this study is to reveal the evolution of cognitive logics in the development process of entrepreneurial enterprises and the action mechanism between cognitive logics at different stages and entrepreneurial opportunities. Therefore, longitudinal data of the entrepreneurial enterprise development are needed, and comparative analyses of longitudinal double cases are indispensable.

The case selection

The selected cases, based on the research problems in this work, must meet three conditions. First, after a period of development, the entrepreneurial enterprises must be successful so that the process in which the cognitive logic of the entrepreneurial enterprises evolves can be explored. The selected firms for the case studies include Qingdao Kutesmart Co., LTD. (QKS) and Handuyishe E-Commerce Group Co., LTD. (HEG), which have overall overcome the impact of clothing market depression and e-commerce on the clothing industry and achieved initial successes.

Second, the market backgrounds of the entrepreneurial enterprises are different when these two firms were founded. QKS was founded in 1995, but due to poor management, the current entrepreneurial team inherited the QKS brand in 2003 and focused on garment production. HEG was founded in 2006 when Japanese and Korean fashion was prevailing in the Chinese clothing market. Through the longitudinal comparative analyses of the two cases, the influences of the development of the firms on cognitive logic can be clarified, and the particularity and contextuality brought by the individual cases can be weakened so that this study has a certain external validity.

Finally, the two firms have been well integrated with the emerging technologies, such as big data, artificial intelligence, mobile/Industrial Internet, cloud computing, and so on, in the processes of the development. With the help of these technologies, both of the firms can respond immediately to the needs and can tap the
potential needs of their consumers. Therefore, for practice, the entrepreneurial processes of the two firms can explain the influences of the development of these emerging technologies on the cognitive logic of the entrepreneurial enterprises and can expound the transition from discovery opportunities to the collaborative use of discovery opportunities and creation opportunities.

Data collection

Data collection consists of three steps. First, relevant second-hand data that included official website information, media coverage information, Annual Report, development record, or other related data (e.g., government publication, press articles, industry reports, etc.) were initially collected from QKS and HEG (Table 1 provides the details of second-hand data). These data enable the investigators to have a comprehensive understanding of the development processes, major events, and current situations of the firms, enhance the sensitivity of the investigators to some unique phenomena reflected by the firms, and provide a solid foundation for the subsequent determination of the direction of primary data collection (Darke et al., 1998). At the same time, the theoretical perspective of the research was determined to be cognitive theory through reading and combine the classic and the current literature. The investigators, combined with the collection of secondary materials, preliminarily designed a semi-structured interview outline and also paid attention to maintain a certain openness to allow the emergence of new constructs and the development of the theoretical perspective (Walsham, 2006). In addition, the collection of secondary data and the adoption of cognitive theoretical perspectives enable the investigators to build a preliminary theoretical framework (Pan & Tan, 2011), which is used as the blueprint for the following interviews and case analyses.

Table 1 Second-hand data of QKS & HEG

<table>
<thead>
<tr>
<th>Firm</th>
<th>Types of second-hand data</th>
<th>Number of documents</th>
<th>Document source</th>
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<tbody>
<tr>
<td>QKS</td>
<td>Official website information</td>
<td>5</td>
<td>Authors Collection</td>
</tr>
<tr>
<td></td>
<td>Media coverage information</td>
<td>42</td>
<td>Authors Collection</td>
</tr>
<tr>
<td></td>
<td>Annual Report (2003-2020)</td>
<td>18</td>
<td>Firm offers</td>
</tr>
<tr>
<td></td>
<td>Development record</td>
<td>31</td>
<td>Firm offers</td>
</tr>
<tr>
<td></td>
<td>Other related data</td>
<td>19</td>
<td>Authors Collection</td>
</tr>
<tr>
<td>HEG</td>
<td>Official website information</td>
<td>7</td>
<td>Authors Collection</td>
</tr>
<tr>
<td></td>
<td>Media coverage information</td>
<td>34</td>
<td>Authors Collection</td>
</tr>
<tr>
<td></td>
<td>Annual Report (2006-2020)</td>
<td>15</td>
<td>Firm offers</td>
</tr>
<tr>
<td></td>
<td>Other related data</td>
<td>15</td>
<td>Authors Collection</td>
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</tbody>
</table>

Second, the investigators conducted interviews and long-term tracking with the QKS and HEG founding members, senior management team members, and ordinary staff (Table 2 provides the details of the interviews). Each informal interview lasted about 30 minutes, and each formal interview lasted about 60-120 minutes. The interviewees were invited to the interview room for one-to-one/one-to-many interviews. In the process of the interview, according to the content of the recorded interview, an interviewee was advised to recommend and choose the next interviewee. This process, similar to the snowball sampling method, was used because it was difficult to identify suitable interviewees by the interviewers (Biernacki & Waldorf, 1981). Both formal and informal interviews begin with open questions, focusing on the company’s entrepreneurial experience, entrepreneurial team composition, major decisions, business development, and integration with new technologies.

Table 2 Interviewees and interview time

<table>
<thead>
<tr>
<th>Firm</th>
<th>Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>QKS</td>
<td>Chairman of the board (Mr. Zhang)</td>
</tr>
</tbody>
</table>
Firm | Interviewees
---|---
VP (Mr. Li) | April 8, 2019 (3.2h)
Reception manager (Ms. Song) | May 12/15, 2018 (5.2h)
April 6, 2019 (6.1h)
Employees (18) | August 8-15, 2017 (About 1h/Employee)
May 12-16, 2018 (About 1.5h/Employee)
April 4-9, 2019 (About 1.5h/Employee)
May 20, 2017 (2.2h)
April 7, 2018 (2.1h)
June 4, 2019 (1.8h)
Team leader of IOSSP (6)
Note: (1) IOSSP means Integrated Operating System for a Single Product, which is an...the reliability and validity of our study, and did not involve the disclosure of their own privacy.
HEG VP (Mr. Jia) | June 21, 2017 (2.5h)
April 9, 2018 (2.3h)
June 4, 2019 (2.2h)
Reception manager (Mr. Li) | June 20, 2017 (2.2h)
April 7, 2018 (2.1h)
June 4, 2019 (1.8h)
Team leader of IOSSP (6)
Note: (1) IOSSP means Integrated Operating System for a Single Product, which is an...the reliability and validity of our study, and did not involve the disclosure of their own privacy.
HEG Reception manager (Mr. Li) | April 6, 2019 (2.3h)
HEG Employees (12) | June 20-22, 2017 (About 1h/Employee)
April 7-9, 2018 (About 1.5h/Employee)
June 7-8, 2019 (About 1.5h/Employee)

Furthermore, a field supplementary interview and several online interviews were conducted to make up the missing and weak data for the two firms to ensure the integrity of the evidence chain of the case analyses. All interviews were digitally recorded and transcribed by the investigators within 24 hours after the respective interviews, forming more than 200 pages of written materials. At the same time, more than 80 pages of on-site records and more than 100 photos of on-site interviews were collected as supplements. All the collected text materials, photos, notes and, other auxiliary data were entered into the database to manage and analyze these qualitative data.

**Data analyses**

With the flexibility of the case study method, data collection and data coding were carried out simultaneously to achieve complementary effects in this study (Eisenhardt, 1989). The temporal bracketing strategy, the narrative strategy, and the continuous comparison strategy were adopted in the process of data analysis (Eisenhardt, 1989).

Data collected through formal and informal interviews, together with secondary data, were classified according to the emerging topics and subjects in the literature, and additional data were continuously collected through formal and informal interviews (Gregory & Keil, 2014). Meanwhile, data processing was conducted according to open coding, selective coding, process analysis, and theoretical coding in rooted theory (Bryant & Charmaz, 2007; Gregory et al., 2013). Afterward, to facilitate data management and in-depth analysis, a figure to represent each stage of the development of the two firms, and the data are integrated into the narratives of each stage.

The first author of this paper proposed the initial framework, and the other authors played the role of devil’s advocates, constantly questioning and analyzing, so that the theory-based model could explain the phenomena reflected in the data to the greatest extent, and could promote the credibility and validity of the case analyses (Pan & Tan, 2011; Gregory & Keil, 2014). The new model was saturated through the temporal
bracketing strategy, the narrative strategy, and the continuous comparison strategy. When more data are collected and entered into the model, the model can explain the phenomena without further correction (Eisenhardt, 1989).

Based on the above coding analysis, this work presents the coding results using the data structure method proposed by Gioia, Corley and Hamilton (2013). The first-order categories are the different categories condensed from the primary and secondary data, the second-order themes is the clustering of the condensed categories into different themes, finally, we assembled the second-order themes into overarching dimensions that made us clarify entrepreneurial cognitions and cognitive logics and establish a theoretical framework to connect the various phenomena that emerge from the data. This analysis generated Figs 1 and 2.

Fig. 1. Data structure – Types of entrepreneurial cognition

Fig. 2. Data structure – Cognitive logic

In order to ensure the credibility and validity of the case analyses, the investigators mainly adopted the triangulation strategy, the informant and group check-up strategy, and the case database strategy in the stage of data collection and analysis. The narration and analysis in each stage were based on triangle statistics from at least two sources and agreed upon by at least two interviewees. The case descriptions and case analyses were repeatedly sent to the information providers and peers for review and modification until an agreement was reached.

Case Descriptions

The process of entrepreneurship in QKS

QKS located in Qingdao, Shandong Province, China, its brand was created in 1995, but the company now working in the clothing industry was created in 2003, and this paper divides its entrepreneurial process using 2003 as the starting date. It has undergone three major strategic reforms in the process of development. First, the digital reform of the firm, focusing on solving the problem of overstocking, was carried out in 2006. Second, it began the strategic layout of mass personalized customization (MPC) in 2008 and gradually realized the customer demand-oriented make-to-order production mode, i.e., “sell first and produce later”. Third, it built its own MPC service platform, completed the strategic layout of MPC, made all production demand-oriented, and began to cultivate and develop the source theory of data engineering (SDE) in 2015. The QKS entrepreneurial process could be divided into the following three stages (Fig. 3).

Fig. 3. QKS entrepreneurial stages

The process of entrepreneurship in HEG

HEG, located in Jinan, Shandong Province, China, is a fashion brand clothing sales enterprise established in 2006 relying on the T-Mall E-Commerce Platform. There are three key historical milestones in the process of HEG entrepreneurial development. First, it began the journey of creating a new brand in 2008, and then successfully created four brands. Second, it changed organizational structure to a Product Group System to develop new garments and successfully replicated its previous experience of creating brands, increasing the number of brands owned by the company to over 20. Third, it has formed a well-established Integrated Operating System for a Single Product (IOSSP) and laid out a Fashion Brand Incubation Platform (FBIP). HEG entrepreneurial process is shown in Fig. 4 below.

Fig. 4. HEG entrepreneurial stages
Case Analysis

This section will provide an in-depth analysis of each stage of the QKS and HEG entrepreneurial process, specifically, the role played by three types of, i.e., creative, social and practical, cognitions, the process by which three types of, i.e., single, parallel and natural, logics analyze, evaluate and screen ideas, and the relationship between ideas, opportunity set, discovery opportunities and creation opportunities.

Types of entrepreneurial cognition

*Types of entrepreneurial cognition in QKS.* The period from 2003 to 2007 was the initial stage of its entrepreneurship, and they seized the opportunity of short supply in the clothing market at that time and began to carry out large-scale production. Meanwhile, QKS had obtained a series of ideas from stakeholders and the market, and analyzed, predicted and evaluated the innovation, fit and practicality of them to form opportunities that the firm could take advantage of. As Mr. Li, VP of QKS, recalled,

At that time, demand exceeded supply, we only needed to analyze the demand from the feedback from dealers and chose the types of clothing that the firms could produce in large quantities. ...

The Chinese clothing market has entered a period of oversupply and personalized demand since 2008. With the problem of high inventory, QKS began to take the road of digital transformation to narrow the distance with consumers and to more accurately grasp the changing trend of market demand. Meanwhile, QKS gradually regarded customer demand data as one of the criteria for novelty, acceptability, and enforceability for evaluating ideas, to screen and refine the opportunities suitable for the current development of the enterprise. As Mr. Zhang, chairman of QKS, recalled,

Consumer personalized demand for clothing was becoming more and more prominent. We should find ways to obtain customer demand data and should consider the problem from the customer perspective. ...

QKS accurately predicted that the future demand of the clothing market would be personalized and fragmented, and began the strategic layout of MPC in 2014. Mr. Zhang, the chairman of QKS, believed that MPC was the future development direction of clothing enterprises after observing the many trend changes abroad. In the interview, Mr. Zhang also mentioned,

The market demand for clothing in the future should be personalized and fragmented. What we need to do is to turn the market demand into the source of mass production through data collection and analysis. ...

After the successful transformation, QKS implemented the make-to-order production mode which is completely driven by customer demand data, and the products to customers must be delivered within 7 days. Since 2015, QKS has successfully built its own personalized customized service platform to further promote real-time interaction between itself and the customers. At the same time, QKS established the Institute of New Drivers and Governance Engineering, using its own successful transformation experience in MPC, and formed the SDE to provide solutions of digital transformation and MPC for other enterprises. At this stage, QKS can communicate directly with customers, and accumulate their demand data in the platform for analysis, integration, and reshaping, to combine novelty, acceptability, and enforceability to select opportunities suitable for the current context and future development planning of the entrepreneurial enterprises. As Mr. Zhang, chairman of QKS, recalled,

We have realized the production mode of MPC, but many Chinese enterprises are not aware of its existence. Thus, we should extend our experience to help more enterprises, which is a challenge but also an opportunity. ...

*Types of entrepreneurial cognition in HEG.* In the first stage from 2006 to 2007, HEG was mainly engaged in clothing purchasing and sales. It needed to make comprehensive analyses of the changes in consumer demands, the acceptance of stakeholders, and the maneuverability of decision-making, to determine what fabrics, styles, and brands of clothing the firm chose to sell. As Mr. Jia, the VP of HEG, recalled,
At that time, Japanese and Korean-style clothing sold very well in the Chinese market, and we only needed to sell selectively according to the feedback of consumers.

As the second stage, HEG began to refocus strategy and create brands in 2008. At the same time, it needed to make comprehensive analyses of the novelty and enforceability of the brands, stakeholder acceptance, and so on according to the development status of the firm and the changes of consumer needs in the process of creating brands. With the success of the first brand creation, HEG promted this successful experience and possessed more than 20 private brands by 2016. Mr. Jia, the VP of HEG, gave a brief overview of their brand-building process in an interview.

We analyzed the demand data of the consumers and designed the brand characteristics, culture, and logo, to quickly get the recognition of and popularity among the consumers.

HEG realized that not only could it build a brand, but it could also share its brand-building experience with other companies. Therefore, in the third stage, it began to build the FBIP and established a comprehensive analysis and evaluation system to evaluate the novelty, acceptability, and enforceability of each brand, to greatly improve the survival rate of the brands in the market. As Mr. Jia, VP of HEG, recalled,

We had accumulated a lot of experiences in building our brands and were wondering if we could pass those experiences on to other companies to help them build their brands. HEG has created the FBIP after several years of efforts and launched more than 70 brands out of the platform.

According to a brief overview of the entrepreneurial processes of the above two entrepreneurial enterprises, it can be found that they need to carry out a series of analyses and evaluations from the creation of ideas to the entrepreneurial opportunities that the entrepreneurial enterprises can implement. Specifically, the entrepreneurial team should predict, analyze and evaluate the novelty, creativity, and attractiveness of an idea, and the possibility of an idea causing emotional resonance among entrepreneurial team members and other stakeholders. The entrepreneurial team should also analyze the suitability of an idea for entrepreneurial enterprise development, market demand trends, and the interests of stakeholders. Therefore, this paper refers to the knowledge structure used by entrepreneurial teams in the three analysis and evaluation processes of innovation, consensus, and practicality of ideas as creative cognition, social cognition, and practical cognition.

The relationship between cognitive logics and ideas

Single logic. In the early stage of entrepreneurship, since the entrepreneurial enterprise was just established, the entrepreneurial team members were not familiar enough with each other and did not form a unified view of some key events and major decisions. Thus, the ideas generated externally and internally needed to be procedurally analyzed, evaluated, and screened before they could be accepted and executed by most members of the organization so that the ideas could be transformed into opportunities that the entrepreneurial enterprise could use.

At this stage, the kind of fabrics, styles, and specifications of clothing that QKS produces need to be determined by the entrepreneurial team according to the prediction of changes in market demand and combined with their existing knowledge structure. First, the entrepreneurial team captured ideas about what style of clothes to produce internally or externally, and integrated them into the operations of the entrepreneurial enterprise. Second, the entrepreneurial team members analyzed and evaluated the novelty, creativity, and attractiveness of these ideas, and eliminated those ideas that were underperformed in terms of creativity. Third, they analyzed and predicted whether the remaining ideas could arouse the emotional resonance of the entrepreneurial team members, stakeholders and consumers, and eliminated those ideas that were innovative but could not be accepted by stakeholders and consumers. Fourth, they analyzed and predicted whether the remaining ideas were suitable for the current context of the entrepreneurial enterprise development, future strategic planning, and maneuverability. Finally, the remaining ideas would be optimized, integrated, and reshaped to form an opportunity set within the entrepreneurial enterprise,
laying the foundation for the next step to derive opportunities that the entrepreneurial enterprise could take advantage of. As Mr. Zhang, the chairman of QKS, and Mr. Li, the VP QKS, recalled,

...There were procedural evaluation criteria for all kinds of clothes we produced at that time. On the one hand, in this way, we could reduce the conflicts caused by high-level disagreements and enhance the cooperation among team members. ... On the other hand, we could quickly screen out the ideas that met the requirements. ... 

Choosing which brands, styles, and prices to buy as an agent is a decision HEG needs to make based on changing trends in market demand and taking into account its own actual situation. Through the analysis of the interview data of HEG, the processes of analyzing, evaluating, and selecting ideas are found to be similar to those of QKS. As Mr. Jia, the VP of HEG, recalled,

...We also had our own set of evaluation criteria for the kinds of clothes to choose from at that time, so that we could avoid many problems and make decisions quickly.

In the first stage of entrepreneurship, ideas must be analyzed, evaluated, and predicted by creative cognition, social cognition, and practical cognition to accumulate to form an opportunity set within the entrepreneurial enterprises, and then further derive the opportunities that the entrepreneurial enterprises can use. In this work, the cognitive logic composing of the above three types of cognitions that play a role in evaluating ideas in the sequence is called the single logic. At the same time, there may be a second round or even more rounds of evaluation in the process of correcting the ideas through the single logic until an idea can be adopted into the opportunity set or discarded.

Parallel logic. The entrepreneurial team members become gradually familiar with each other and form a similar knowledge structure in the process of long-term communication and learning. They will also tend to have consistent interpretation and prediction of the same key event. When an entrepreneurial enterprise enters this stage, the organization no longer needs procedural single logic to legitimize ideas but needs to improve the efficiency of analyzing, evaluating, and screening the ideas to quickly respond to the changes in market demand and to seize the fleeting entrepreneurial opportunities.

The way QKS and HEG analyze, evaluate, and screen ideas within the organization during this stage is different from the stage of single logic. First, according to the attributes embodied within the ideas, after entering the organization, these ideas will naturally be marked with one, two, three, or no of the labels innovation, resonance, and practicality. As employees of QKS recalled,

...With the help of digital technology, many ideas related to product design and production in the firm would be labeled to help us distinguish them. ...

As HEG’s team leader of IOSSP recalled,

...Within our capabilities and with the help of digital technology, we would also label the ideas that emerged within the organization as our own and divided them into different categories.

Second, the ideas with different labels are handled in different ways. The ideas without any label are analyzed and evaluated for their innovation, resonance, and practicality. The ideas with only one label are analyzed and evaluated for their other two attributes, for example, the ideas with labels innovation are further analyzed and evaluated for their resonance and practicality. The ideas with two labels are analyzed and evaluated for their remaining attribute, for example, the ideas with labels resonance and practicality are analyzed and evaluated for their innovation. Meanwhile, the ideas with all three labels do not need to be analyzed and evaluated for any of their attributes. As Mr. Li, the VP of QKS, recalled,

...We would analyze and evaluate ideas according to their labels, keep those ones that met our expectations, and eliminated the others. ...

As Mr. Jia, the VP of HEG, recalled,
We would use different analysis and evaluation methods for different types of ideas, so as to deal with them more efficiently.

Finally, the ideas with all three attributes of innovation, resonance, and practicality will remain within the organization and will be added into the opportunity set after further optimization, integration, and reshaping. At the same time, the entrepreneurial team then derives the entrepreneurial opportunities that the entrepreneurial enterprise can use from the opportunity set.

In the second stage, the ideas do not need to be analyzed according to the established procedures of single logic. But according to the attributes of the ideas, the entrepreneurial team selectively uses zero, one, two, or three from creative cognition, social cognition, and practical cognition to analyze, evaluate, revise and screen the ideas. In this work, the cognitive logic in which the three types of cognition are used selectively but not in order according to the attributes of ideas is called parallel logic.

Natural logic. The rapidly developed digital technology breaks through the limitations of time and space in communication between the entrepreneurial enterprises and their consumers, and captures the demand data of the consumers in real-time. Therefore, the decision-making style of the organizations gradually shifted from experience and prediction based to data and analysis results based. At this stage, the focus of the entrepreneurial enterprises is no longer on the consensus or efficient screening of the ideas, but on the analysis, abstraction, and condensing of consumer demand data to directly form ideas that are in line with the current development and future strategic planning of the entrepreneurial enterprises, and on the instant interaction between entrepreneurial opportunities and changes in consumer demand.

QKS began to apply digital technology to business management, production, and sales, and gradually implemented the data-driven production and manufacturing processes. QKS began to build the MPC platform to capture, analyze, integrate, and transmit the consumer data in 2015 so that various stakeholders inside and outside the organization gradually realized data-based collaboration.

HEG built the FBIP based on its own brand-building experience and digital technology, and helped itself and the companies on the platform create brands that met its image and market demand trends through the acquisition, analysis, and abstraction of consumer demand data.

Great changes have taken place in obtaining and evaluating ideas in QKS and HEG. First, ideas initially come from the acquisition, analysis, and abstraction of consumer demand data, which are no longer predictions of future changes in consumer demand, but demands that already exist or will occur. As employees of QKS recalled,

...After our system analyzes the consumer demand data, the factory produces the clothes needed at this stage according to the instructions formed from the results of data analysis.

As employees of HEG recalled,

We made certain adjustments to our products based on the constant changes in consumer demand data to quickly respond to changes in demand.

Second, QKS and HEG use digital technology to assist in the processes of analysis, evaluation, and screening of ideas. In the process of evaluating innovation, resonance, and practicality of ideas, the platform will use specific algorithms to break down the ideas, predict efforts needed by various departments within the firm, and figure out cooperation needed by external stakeholders, in order to analyze whether the ideas can be accepted or can resonate. The consumers also participate in the evaluation to determine the innovation and enforceability of the ideas. As Mr. Li, the VP of QKS, recalled,

...The demand data of consumers are varied. We use the platform to collect them and split them into standardized steps that can be performed by the factory through the algorithm for MPC production.

As Mr. Jia, the VP of HEG, recalled,
We must clean and process the collected data and get a clear consumer expectation of the brands to make appropriate changes to the brands.

Finally, the evaluation of innovation, resonance, and practicality is carried out at the same time. The entrepreneurial enterprises only retain the ideas with attributes meeting the three evaluation criteria. The retained ideas are then added to the opportunity set after optimizing, integrating and reshaping within the entrepreneurial enterprises. As employees of QKS recalled,

...The standardized processes resulting from these splits would only be implemented if we could personalize, and the others were not within our scope of consideration. ...

As employees of HEG recalled,

...We only made adjustments according to the consumer expectations that we could all meet at this stage. ... The others would be kept in the database and might be improved to the brand in the future. ...

The entrepreneurial team, based on the data of stakeholders and consumers in the digital platform and with the help of digital technology, analyses, evaluates and predicts ideas in real-time. The ideas are screened through the interactive evaluation between the three, i.e. creative, social and practical, cognitions, which is similar to entering a three-dimensional spatial model composed of three types of entrepreneurial cognitions, and are modified to enter the opportunity set and then transformed into opportunities that the entrepreneurial enterprises can use. This work refers to the logical relationship between the three types of cognition using digital technology to form a similar three-dimensional spatial model to analyze, evaluate and predict creativity as natural logic.

In summary, the cognitive logics of the two firms have undergone three stages in the entrepreneurial process (Fig. 5). These three stages are the single logic to gain recognition and support from the entrepreneurial team, the parallel logic to improve the efficiency of analysis, evaluation and screening of the ideas, and the natural logic of ideas for abstraction, analysis, correction and selection based on data analysis.

**Fig. 5. The evolutionary process of cognitive logic**

**The relationship between the opportunity set and the entrepreneurial opportunities**

*Focusing on using discovery opportunity.* In the initial stages of the entrepreneurship of QKS and HEG, most of the ideas accumulated within the organization were essentially for discovering the existing mismatches between the supplies and the demands in the market. These ideas entered the opportunity set after the single logic analysis, evaluation and correction. The entrepreneur/entrepreneurial team then identified and evaluated the entrepreneurial opportunities that the firm could take advantage of from the opportunity set.

The innovation, resonance, and practicality of the opportunities in the opportunity set have been analyzed and evaluated by the entrepreneurial team to reach a consensus. However, due to the influence of resource availability, capacity, stakeholder preferences, consumer demand, and so on, it is impossible for entrepreneurial enterprises to use/implement all the opportunities in the opportunity set. Hence, the entrepreneurial team should identify and evaluate the opportunities to select the ones that are most in line with the current development situation and future strategic planning of the entrepreneurial enterprises. The remaining opportunities should be kept in the opportunity set to provide the basis for the formation of the next opportunity set. As Mr. Li, the VP of QKS, recalled,

...After comprehensive consideration, combined with the situation of the entrepreneurial enterprises at that time, we chose a limited number of opportunities as the key investment projects, and retained the rest...

As Mr. Jia, the VP of HEG, recalled,

...Resources in all aspects were limited so that we could only seize the opportunities that were most critical to the enterprise. ... The others would wait for the right time in the future...
Judging from the source of these entrepreneurial opportunities, they were formed by the mismatches between supplies and demands that existed objectively in the market. Therefore, the opportunities used by the two entrepreneurial enterprises in the early stages of entrepreneurship were essentially discovery opportunities.

As employees of QKS recalled,

... At that time, the biggest feature of the clothing market was that supply fell short of demand. As long as we made the right decision, we were not afraid that clothes could not be sold.

As employees of HEG recalled,

... Under the prevailing Japanese and Korean styles, as long as we could understand the needs of the consumers, our clothes could certainly be sold.

*Using discovery opportunity or implementing creation opportunity.* During this period, the development of the entrepreneurial enterprises had begun to take shape, the goal of the entrepreneurial enterprises had changed from survival to better development, and the entrepreneurial enterprises had expected to grow into leading firms in the industry. The ideas of QKS and HEG at this stage had two sources, one was the mismatches between the supplies and demands in the market, and the other was the new demand created by the entrepreneurial enterprises through understanding and forecasting of consumer demand. These ideas need to be analyzed, selected and modified by *parallel logic* before entering the opportunity set, and formed the current opportunity set together with the remaining opportunities from the opportunity set.

The entrepreneurial team could not only identify and evaluate the discovery opportunities from the opportunity set and use them but also could conceptualize and objectify creation opportunities from the opportunity set and implement them. At the same time, the entrepreneurial team could only analyze and evaluate the innovation, resonance, and practicality of the ideas created by the firms before adding them to the opportunity set. However, in the process of real practice, the opportunities can be expressed succinctly and clearly through conceptualization, and then can gain the recognition of the stakeholders and the consumers through objectification. They could be implemented only after they have completed these two steps. As Mr. Zhang, the chairman of QKS, recalled,

... We not only decided what kind of clothes to produce but also explored the direction of digital transformation of our own and other specific firms.

As Mr. Jia, the VP of HEG, recalled,

... On the one hand, we should choose which clothes we should purchase at this stage. ... On the other hand, we also needed to think about what brand we should create, and what consumer needs had not been tapped or had not yet been realized. ...

The sources of formation of these entrepreneurial opportunities can be divided into two types, one is the discovery opportunities formed by the mismatches between supplies and demands in the market, and the other is the creation opportunities based on the understanding and prediction of the consumer demands in the market. As employees of QKS recalled,

... We could decide on what kind of clothes to produce according to the changes in the market, ... but how to realize MPC could only be determined by ourselves. ...

As employees of HEG recalled,

... We only needed to decide what kind of clothes to sell according to the popular trend in the market, ... but how to create new brands required us to explore, innovate...

*Focusing on implementing creation opportunities.* When the entrepreneurial opportunities used/implemented by the entrepreneurial enterprises no longer adapt to the trends of market demands, the entrepreneurial enterprises must find new growth points based on their understanding of the existing situation of the industries. Otherwise, their business performances will begin to decline. As Mr. Zhang, chairman of QKS, stated,
The inventory pressure caused by mass production had threatened the survival of QKS in 2008. ... 

As Mr. Jia, VP of HEG, stated, 

In 2008, the sales of our Japanese and Korean style clothes began to decline sharply. ... 

In this stage of QKS and HEG, the sources of the ideas were mainly based on their understanding of their business and consumer demands, and their marketing strategy, to further tap customer demand potential and to create new demands. After natural logic analysis, evaluation, and correction, most of these ideas would be eliminated by the entrepreneurial enterprises, and only a few of them would enter the opportunity set of the current stage. As Mr. Li, the VP of QKS, recalled, 

... We attempted a lot and finally decided to take the road of digital transformation to achieve MPC, and accumulated rich experience in this process. 

As Mr. Jia, the VP of HEG, recalled, 

... We have also designed many solutions, but most of them failed. In the end, we realized that we might create our own brand. ... 

A relatively clear boundary exists within the opportunity set of the entrepreneurial enterprises. One subset has the opportunities related to their traditional businesses, which support the survival and the sustainable development of the businesses. The other subset has the opportunities related to the future strategic planning of the entrepreneurial enterprises, which will guide them to grow into a leading enterprise in the industry in the future. As Mr. Zhang, the chairman of QKS, recalled, 

... On the one hand, we used consumer data to achieve the mode of MPC to produce clothes. ... On the other hand, we created the Institute of New Drivers and Governance Engineering to provide systematic solutions for the digital transformation of the firms. 

As Mr. Jia, VP of HEG, recalled, 

We gave up the purchasing agency business. ... One part of our business was operating our own more than 20 brands to sell clothes. ... The other part was to establish the FBIP to share our own brand-building experience with other firms. ... 

During this period, opportunities related to traditional businesses had insufficient development potential and the entrepreneurial enterprises were already very proficient in their execution processes. Therefore, the entrepreneurial enterprises would focus most of their energy on opportunities related to future strategic planning to ensure the success of the transformation at the key points. On the one hand, the opportunities related to the traditional businesses were mainly discovery opportunities, and the demand potential of consumers has been fully tapped by enterprises. On the other hand, opportunities related to future strategic planning are primarily about creating opportunities, and most of the ideas formed by these opportunities were created based on the analysis of consumer demand data. Therefore, the entrepreneurial enterprises would devote most of their energy to creation opportunities at this stage. As Mr. Li, VP of QKS, recalled, 

... Clothing production was an important part of our business, but our strategic goal was to become a systematic service provider for the digital transformation of enterprises in the future. ... 

As Mr. Jia, the VP of HEG, recalled, 

... The good operation of these more than 20 brands was the foundation of our survival, but we would focus more on the FBIP to provide more enterprises with systematic solutions for brand creation in the future. 

In summary, due to the different sources of ideas and different cognitive logics, the number and types of opportunities in the opportunity set have also changed significantly at different stages of entrepreneurship. On the surface, there is only an increase in the number of discovery and creation opportunities (Fig. 6), but the core of work has changed significantly in essence, i.e., from focusing on using discovery opportunities to implementing creation opportunities.
Discussion

This study conducts systematic analyses of the entrepreneurial processes of QKS and HEG, and finds that there are three different types of, i.e., creative, social and practical, cognitions. Meanwhile, they show three different cognitive, i.e., single, parallel and natural, logics. The types of opportunities used/implemented by the entrepreneurial enterprises change in different stages and contexts of their development. This section will continue the discussion on why cognitive logics and types of entrepreneurial opportunities evolve, in order to clarify the drivers underlying the evolution of cognitive logics and the reasons why entrepreneurial enterprises move from focusing on using discovery opportunities to implementing creation opportunities.

The dynamics of cognitive logic evolution

*The entrepreneurial team becomes familiar and consistent.* At the beginning of the establishment of the entrepreneurial team, due to the differences in the individual background and cognition (Dufays & Huybrechts, 2016), it is difficult for the members to have the same interpretation of the same event (Zheng, 2012; Zheng & Mai, 2013; de Mol et al., 2015), but all members need to quickly reach an agreement and work together for the same goal to make the enterprise better survive. Therefore, a mechanism is needed to unify the entrepreneurial team’s different interpretations of the key events in the initial stage as soon as possible within the entrepreneurial enterprises, and the cognitive structure of *single logic* is undoubtedly the best choice in this context. Standardized procedures and evaluation systems are adopted to make the analysis, evaluation and selection process of the ideas transparent, so as to establish the status of the opportunities used by the entrepreneurial enterprises within the organization and obtain the support of the entrepreneurial team members.

With the gradual familiarity and frequent daily communication among the entrepreneurial team members, a certain tacit understanding will be formed among them (Boeker & Wiltbank, 2005; Eisenhardt, 2013). The mutual learning among team members also equips them with similar knowledge reserves (de Mol et al., 2015). At this time, the entrepreneurial team’s cognition, understanding, and even prediction of some key events will converge (Foss et al., 2008; DeChurch & Mesmer-Magnus, 2010), so that the entrepreneurial enterprises no longer need programmed *single logic* to establish the legitimate status of ideas to gain the support of the majority of the members. Meanwhile, with the gradual understanding of the industry, more and more ideas will be accumulated, and the entrepreneurial team needs more flexible cognitive logic to improve the agility of analysis, evaluation and selection process of ideas.

*Digital technology is deeply integrated with the routine management of entrepreneurial enterprises.* In the digital era, entrepreneurial enterprises will inevitably rely on digital technology in the process of development (Amit & Han, 2017; Nambisan, 2017; Autio et al., 2018), but may take different attitudes towards digital technology, and may have different degrees of integration of digital technology into the routine management, at different stages of development. Unless it is engaged in digital technology R&D and innovation, an entrepreneurial enterprise simply uses digital technology to perform some auxiliary tasks in the initial stage of entrepreneurship. On the one hand, the entrepreneurial enterprises must invest extremely scarce resources in the current stage of focusing on entrepreneurial opportunities, leaving not many resources for other aspects. On the other hand, the primary goal of the company is to survive, and the firms may not have much energy and time to focus on digital technology integration into routine management.

With the development and growth of entrepreneurial enterprises, ideas will become more diversified and complicated, and the use of digital technology can improve the speed and accuracy of their processing. At the same time, the rapid development of digital technology breaks the limitation of time and space for communication between entrepreneurial enterprises and consumers (Du et al., 2018. Nambisan et al., 2019). The ideas extracted from consumer demand data contain the actual or upcoming needs of consumers. The
ideas are more targeted, more diverse and more timely, and the entrepreneurial enterprises must use digital technology to analyze, evaluate and screen these ideas to complete the processing in time and keep up with the changing trend of the market demand. Therefore, in the process of deep integration of digital technology and routine management of the entrepreneurial enterprises, the decision-making mode has changed from prediction-driven to data-driven, and the cognitive logic has also evolved from parallel logic to natural logic.

The reason for focus transformation from discovery opportunity to creation opportunity

A discovery opportunity is essentially an opportunity in which the entrepreneur/entrepreneurial team discovers the mismatches between the supplies and demands (Eckhardt & Shane, 2003; Alvarez et al., 2013), that exist objectively in the market (Shane & Venkataraman, 2000). The entrepreneurial enterprises only need to identify those opportunities that match the current context and future strategic planning, and then evaluate whether they can use them, what difficulties they will encounter in the process, whether they can overcome these difficulties, and what kind of value these opportunities can create. Finally, the discovery opportunities can be utilized when they meet the expectations.

The concept of creation opportunities was originated from the school of constructivism (Fletcher, 2006; Alvarez et al., 2013), which believes that opportunities are created (Suddaby et al., 2015). It is a process of continuous learning, revision, and iteration from the emergence of creativity to the formation of the opportunity (Wood & McKinley, 2010), and even the final opportunity may be completely different from the original creativity. The entrepreneurial enterprises need long-term and continuous strategies to support creation opportunities in the process of the formation of them, and need a commitment to invest a lot of human, material and financial resources to succeed. Meanwhile, it is far from enough to implement from the creation of ideas to the formation of the opportunities. The entrepreneurial enterprises need to conceptualize these opportunities so that the stakeholders can fully understand them (Wood & McKinley, 2010; Tocher et al., 2015), and objectively evaluate their strategic values and the degree to which they can accept. These creation opportunities can only be implemented when all these are in line with the expectations.

From the perspective of the formation and utilization/implementation of the discovery and creation opportunities, and their significance to the development of entrepreneurial enterprises, discovery opportunities exist objectively in the market. Consumers are already aware of their needs and demands (Shane & Venkataraman, 2000; Alvarez et al., 2013), so the entrepreneurial enterprises may take advantage of such opportunities with a low risk, which can create large profits but have low strategic significance for their development. Creation opportunities are constructed (Ardichvili et al., 2003; Wood & McKinley, 2010), and consumers have never realized that they would have this kind of demand. It takes time and efforts in the process from the creation of this kind of demand by the entrepreneurial enterprises to the acceptance and the purchase of the products by the consumers. Therefore, entrepreneurial enterprises have a high degree of risk when implementing such opportunities. They may not necessarily bring in large profits but can bring high strategic values at this stage.

The primary goal of an entrepreneurial enterprise is to survive, accumulate resources, and lay a solid foundation for future development in the early stage, hence it will choose those discovery opportunities that are low-risk, and easy to use to obtain high profits. As an entrepreneurial enterprise gradually becomes mature, its goal is no longer survival, but to become a leader in a certain aspect of the industry, so it will gradually focus on those creation opportunities that are high-risk, and difficult to implement but have high strategic value.

In the process of shifting from focusing on using discovery opportunities to implementing creation opportunities, the entrepreneurial enterprises may also go through the mutual transformation between discovery opportunities and creation opportunities (Zahra, 2008; Overholm, 2015; Welter & Alvarez, 2015), and this transformation process begins before but not after the formation of these opportunities. In the process of idea evaluation to the formation of entrepreneurial opportunities, those ideas abstracted based on the actual
needs are the source of the discovery opportunities, and the ones abstracted based on the predicted needs are the source of creation opportunities. However, whether an opportunity is based on the actual demand or the forecasted demand, the entrepreneurial enterprises always extend their own resources and capabilities as the core when they abstract ideas. From the perspective of discovery and creation opportunities, the development of entrepreneurial enterprises is accompanied by the transformation of the two types of opportunities. However, this transformation essentially begins with the formation, analysis, evaluation, and selection of ideas.

Conclusions

Contributions

This paper mainly has the following three theoretical contributions. First, entrepreneurial cognition was analyzed from the perspective of the process of entrepreneurial opportunity formation. Baron (1998) believed that entrepreneurial cognition was the difference between entrepreneurs and non-entrepreneurs in counterfactual thinking, attribution styles, and planning fallacies. Busenitz et al. (2003) further proposed that entrepreneurial cognition was the knowledge structure for the entrepreneurs to discover opportunities and create goods or services (Mitchell et al., 2002, 2004, 2007; Gregoire & Shepherd, 2012). This study analyzes the entrepreneurial processes of QKS and HEG on this basis, and concludes that entrepreneurial cognitions include creative cognition, social cognition, and practical cognition, which play different roles in analyzing, evaluating, and screening ideas that are the sources of entrepreneurial opportunities.

Second, the current research indicates that the startups evaluate the innovation, consensus and practicality of ideas (Mitchell et al., 2011; Gielnik et al., 2012; Stinchfield et al., 2013; Kier & McMullen, 2018), and choose the ideas that meet their standards. This work verifies these earlier results and further clarifies that the operating logics, including single logic, parallel logic and natural logic, of creative cognition, social cognition and practical cognition are different in different stages of the development of entrepreneurial enterprises. The purpose of single logic is to quickly establish the legitimate status of the selected ideas and the entrepreneurial opportunities within the entrepreneurial enterprises to obtain the unanimous recognition and support of the entrepreneurial team. The purpose of parallel logic is to improve the flexibility and agility of the ideas so that the entrepreneurial enterprises can quickly discover/create opportunities. The purpose of natural logic is to deal with a large number of ideas based on consumer demand data by integrating digital technologies with routine management to improve the speed and accuracy of analysis, evaluation, and screening of the ideas.

Finally, the creation opportunities have been considered as opposed to the discovery opportunities. Short et al. (2010) first proposed that discovery opportunities and creation opportunities can coexist, and Korsgaard (2013) further proposed that discovery opportunities and creation opportunities can be transformed into each other in a certain context. This work, starting from the sources of entrepreneurial opportunities, concludes that the transformation of discovery opportunities and creation opportunities begins with the formation of ideas. The opportunities from the ideas that the entrepreneurial team abstracts according to consumer needs are discovery opportunities, while the ones from the ideas that the entrepreneurial team abstracts according to predicted consumer needs are creation opportunities. The opportunity set is just a platform for the transformation of ideas into opportunities.

Limitations and future research

This work uses case studies to investigate the roles of three different types of, i.e., creative, social and practical, cognitions in the process of entrepreneurship, and further analyzes relationships among them. However, it does not elaborate on the factors affecting the formation of the three types of cognitions and the relationship between these three types of cognition and the discovery/creation opportunities. Meanwhile, this
work analyzes the transformation process from focusing on using discovery opportunities to implementing creation opportunities, and discusses the reasons for this process. However, it does not further elaborate what factors affect the formation of the discovery/creation opportunities from the emergence of the ideas. Scholars in related fields can carry out further research on the above two aspects.

Finally, this paper uses case studies to analyze the mechanism of the evolution of cognitive logics and entrepreneurial opportunities. Due to the limitations of the case studies themselves, the study has higher internal validity but lower external validity. Researchers can revise and test the conclusions through multiple case studies or empirical studies in the future.

Reference


