A framework of Digitalization: Insights based on resource orchestration theory for digital transformation of traditional retailers

Huang Qiu Bo[1*], Dong Zi Guang[2], Jiang Yun Feng[3]

School of Modern Service Zhejiang Shuren University,
Hangzhou, Zhejiang,310015 China[1&2]

Asia Metropolitan University, Johor Bahru,Kuala Lumpur, 81750 Malaysia[3]

qiubo_huang@zjsru.edu.cn

[*]Corresponding author

Abstract - *The purpose of this article is to explore how traditional retailers implement overall organization digitalization. A cross-case study based on grounded theory was conducted across four traditional retail enterprise cases, respectively from comprehensive supermarket, department store, brand exclusive chain and home appliance chain. Four digitalization tactics dimensions were obtained: physical resource orchestration, human resource orchestration, organizational structure orchestration and ecological relationship orchestration; two digital competition strategies were distinguished: conservative and offensive strategy. Thereby, based on the resource orchestration theory, a procedural strategy framework was developed, which can be used to guide the implementation of digitalization.*

Key words: *digitalization; resource orchestration; digital competitive strategy; traditional retailer*

1. INTRODUCTION

Technologies as Internet, IoT and AI are driving the development of the digital economy. Digitalization has become the only way for enterprises under the new economic paradigm. "Born digital Enterprises" build digital business models through disruptive innovation, while traditional enterprises are faced with how to carry out digital transformation to adapt to the new environment of digital economy. The digitalization of traditional enterprises has formed a broad consensus, and the global COVID-19 in 2020 has aggravated this trend. But in practice, the progress of enterprise's digitalization is far less than expected. Globally, only 25% of companies have benefited from the digital transition, while most are still learning their way(Kane et al., 2018)[29].A study by Wang Rui et al. on the digital maturity of Chinese enterprises found that the digitization degree of enterprises in terms of operation technology and cultural organization capacity is almost equivalent to the original state(Rui et al., 2019)[39]. It can be seen that at the present stage, digitalization stays at the strategic level, while organizational and operational transformation is facing difficulty in taking a step. Theoretical research is in urgent need of responding to the demand of management practice, to carry out systematical study on the path, obstacle and impact with digitalization.

Traditional retailers are accelerating digitalization. On the one hand, traditional retailers are buying Internet retailers, such as Wal-Mart's merging jet.com. On the other hand, traditional retailers introduce new retail business model to enhance physical stores with digital technology(Hultman et al., 2017[25]; Johan et al., 2016)[28].For example, mobile applications are used to enhance the consumer side's shopping experience(Pantano and Priporas, 2016)[36].For another example, emerging technologies such as the IoT, AR and AI are applied to improve the capability of the retailer side(Grewal et al., 2017), supporting retailers to support management decision with big data(Grewal et al., 2013)[19]. But most of these studies are based on a technical perspective. From the failure experience of the implementation of digital transformation by technical delegation, we can see that digitalization is not only a technical problem, but a problem of promoting technologies in coordination with key organizational activities and even the operation of social systems. The "technology-led logic" be the reason for the disconnection between theory and practice (GrahamTanaka,2017). Too much attention to digital physical input leads to the neglect of basic organization paradigm shifts such as organizational structure, capacity and culture. Therefore, the perspective of "technology + organization" should be followed instead of the perspective of "technology-led logic" for retail digitalization, considering how to integrate digital technology with human, machine, business process and other elements, and finally form a digitally-driven retail organization(Bharadwaj et al., 2013[6]; Davenport and Westerman, 2018)[12].

Compared with the industrial internet in the production-end where European and American countries focus on digitalization, China is moving faster in the digitalization

of consumption-end. China's traditional retail industry is progressing rapidly in digitalization. Investigating the digitalization practice of China's traditional retail industry is helpful to explore the path of digitalization of traditional retailers. This study choose four typical traditional retail enterprise cases respectively from department stores, supermarkets, brand exclusive chain, home appliance chain retail, to parsing how the traditional retail enterprise to achieve the co-evolution of organization structure, business process and digital technology fusion(Nadeem et al., 2018[34]; Sanchez and Zuntini, 2018)[40]. A digitalization framework connecting digital Resource configuration, digital Resource bundling, digital competition strategy is proposed as conclusion, basing on Resource Orchestration theory.

2. LITERATURE REVIEW

2.1 Digitalization of retail industry

The digital transformation retail industry began in the 1970s and evolved in the following aspects.

1）From the static digitization of commodity information to the dynamic digitalization and intelligentization of commodity supply chain. In the early stage, digitization means change the commodity information into static data through barcode, EDI, sales terminal data equipment and so on(Madlenak and Radosinska, 2015)[30].At the present stage, retail industry mainly use RFID, mobile payment, positioning technology, augmented reality, virtual reality and other technologies to support dynamic digitization(Dacko, 2017)[11].

2）From retailer digitization to "retailer - consumer" community digitization. In its early stage, digitalization happened at retailer side. At present, the research of digitalization integrates retailer and consumer together into the same interface. It includes research on empowering consumers, such as innovative search, mobile payment and other technologies; research on empowering retailers' capabilities, such as innovating consumer portrait big data technology, Internet of Things, augmented reality and other technologies(Grewal et al., 2013)[19].These researches distribute in four aspects: exchanges, offerings, actors, and Settings(Johan et al., 2016)[28].

3）From multi-channel sales to omni-channel operation. In recent years, e-commerce enterprises have successively established physical retail businesses, while traditional retail enterprises have also set up their own websites for direct sales or joined e-commerce platforms to open e-commerce businesses. A large number of existing studies have studied online and offline multi-channel coordination from the perspective of new retail business models such as e-commerce and multilateral platforms(Yan et al., 2017)[46], or from the perspective of direct sales of manufacturing enterprises. The study of multi-channel retail essentially regards either channel as an independent part of the business. If online and offline

businesses cannot be deeply integrated, retailers will face problems such as customer transformation, internal resource competition and disordered price system. Brynjolfsson(Brynjolfsson et al., 2013)[8], Pantano and Viassone(Pantano and Viassone, 2015)[37], Verhoef(Verhoef et al., 2015)[45]proposed omni-channel perspective. From the omni-channel perspective, digital retail is channel restructuring and integration based on a series of new sales and shopping behaviors (search, purchase, payment, logistics, feedback, etc.), rather than channel innovation(Mikko et al., 2018)[31]. The omni-channel perspective focuses more on creating consumer engagement experiences than managing retail channels(Vandermerwe and Rada, 1988)[44].

The research on digitalization of retail industry is constantly evolving. The problem at the present stage is that the research on digitalization mainly focuses on the research on technical level(Henriette et al., 2015)[24], the research on organizational change is insufficient. Because the innovation and application of technology are limited by the organization's business process and organization structure, digital value can only be realized through management change(Bredmar, 2017)[7].The research on digitalization needs to break through the perspective of digital technology innovation, upgrade to the level of organizational strategy, with integrating of technological solution, organizational adjustment and management mode reform three factors, considering even the basic organizational paradigm shift and social impact in a broader context to achieve a more comprehensive digitalization framework within a particular industry or business(Johan et al., 2016)[28].

2.2 Organizational perspective digitalization

Productivity gains are the result of organizational change driven by technological innovation, not the technology itself. When organizations do not change with technology, conflicts arise over capabilities, governance, and so on(Svahn et al., 2017)[42]. Therefore, digitalization of organizations is not the application of digital technology to organizations, but how can organizations organically integrate with digital technology to become digitally driven organizations(Johan et al., 2016)[28].The process of digitalization involves changes in work content, business process(Valenduc and Vendramin, 2017)[43], organizational structure(Hansen and Sia, 2015)[21], and business model innovation(Farrington and Alizadeh, 2017)[14],also need management paradigm shifts on leadership, culture, communication, innovation(Chun-hua et al., 2019[9]; Cianni and Steckler, 2017[10]; Jian et al., 2020)[27].Digitization requires not only the reorganization of internal relations, but also the transformation of external relations. The degree of networking and multilateral of the organization's external relations deepens(Pagani, 2013)[35], the factors regulate inter-organizational relationships varies(Bharadwaj et al., 2013)[6], customers and suppliers become important participants in digital value co-creation(Barua et al.,

2004)[5], social organizations are no longer dispensable(Ilsoe, 2017)[26]. To sum up, digitalization is a process of rearranging resources, capabilities and relationships to form an underlying mental model that is compatible with the strategic positioning(Hao et al.)[22].

2.3 Resource Orchestration Theory

Resource orchestration theory is a strategic management theory about how an organization can update its resource base to establish certain competitive advantage. It is theory between resource based view and organizational capability theory. RBV affirms the role of resources in an organization's competitive advantage (Barney, 1991[2]; Barney et al., 2011)[4].But having resources does not necessarily lead to a competitive advantage(Baert et al., 2016[1]; Barney, 2001[3]; Helfat and Peteraf, 2003)[23]. The organization should organize its resources effectively to form the specific capabilities needed to create a competitive advantage. The theory of organizational capacity jumps over the action mechanism of basic resources and directly discusses how an organization's ability to use resources affects its competitive advantage and performance. Resource orchestration theory links RBV and organizational capability theory. Based on the process perspective of resource to capability, resource orchestration theory answers the question of how enterprises can better evolve their capability through the construction, integration and utilization of resource portfolio(Gebauer et al., 2010)[16]. It provides an analytical framework including resource configuration, resource binding, and leverage strategy(Sirmon et al., 2011)[41].Resource configuration refers to a series of behaviors of acquiring, accumulating and stripping resources for the purpose of forming enterprise resource combination. Resource binding refers to the integration and coordination of resources to promote the formation of organizational capacity. Resource leverage refers to the strategic positioning of using resources to gain competitive advantage.

3. METHODOLOGY

3.1 Case Selection

Considering the availability and typicality of data and convenience, this study selected four enterprises (Intime, Uniqlo, Vanguard, and Suning) as examples (Eisenhardt, 1989)[13]. The selected enterprises are described in Appendix A.

These selected enterprises have a long development history and have maintained a stable growing trend. Founded in 1963, Uniqlo has the longest history among them. The remaining three have a history ranging from 20 to 34 years. They are all well-known enterprises in their respective business fields. Specifically, Uniqlo is a world famous clothing brand exclusive chain and Suning E-commerce is an oligarchic enterprise among China's

household appliance chain stores, while Intime ranks at the top of China's department stores. Vanguard ranked first among the comprehensive supermarkets in mainland China（2017）, followed by RT-Mart and Wal-Mart. The four enterprises have made great progress in their endeavors at digital transformation. Suning E-commerce and Uniqlo launched digital transformation very early from which they obviously gained a competitive advantage. Although Intime launched digital transformation relatively late, it has carried out its digital transformation strategy most decisively and proactively among China's department stores since its strategic cooperation with Alibaba. In terms of action and effectiveness of digital transformation, China Resources Vanguard lags slightly behind the other three enterprises, although it actively integrates the online and offline business of comprehensive supermarkets and develops new services. In brief, the selected four enterprises suffice to investigate the digital transformation of traditional retail enterprises.

3.2 Data Acquisition

Data about the selected cases were cited from academic articles in which they are mentioned, as well as news reported, research reports, interview records, and field interviews.

The research team collected 35 internal archived files, including the enterprises' internal journals, business plans, strategic plans, internal memos, conference materials, annual strategic planning documents, customer lists, and historical sales materials. In addition, the research team collected 163 secondhand files by analyzing related news reports and official websites and collecting industry analysis reports. The multi-level and multi-sources data collection method can be used to cross-check the interviews and control the backtracking bias, and the consequent data triangulation enhances the accuracy of the research results.

In total, the research team conducted 6 semi-structured interviews on the selected enterprises (the Semi-structured interview outline is given in appendix B). Prior to the interviews the research team provided an interview syllabus to each of the enterprises so that appropriate respondents, who were familiar with the interview topics and who could thus prepare for the interviews, were designated. Throughout the interview process, the research team took notes and made audio recordings. Each interview lasted for an average of 40 minutes. Within 24 hours, the research team processed and checked the interview notes and audio records, and generated an interview contact sheet. In addition, the team made follow-up calls to the respondents, to clarify uncertain and missing information. This study selects 4 from 6 interviews as research cases. Table 1 lists the respondents, and venues and dates of interviews.

Table 1 Interview profile of the selected cases

Enterprise	Venue	Date

Intime	No. 98,Yan'an Road, Hangzhou, China	2018.06.29
Uniqlo	Kerry Center B1, No. 353,Yanan Road, Hangzhou, China	2018.05.03
Vanguard	No. 142,Zhaohui Road, Hangzhou, China	2018.07.10
Suning	No. 96,Hushu South Road, Hangzhou, China	2018.11.29

Data source: interview contact sheet

3.3 Data Analysis

In this study, interview and text data were subjected to content analysis(Glaser et al., 1999)[17]. First, the interview contents were categorized textually, to generate a project-level case database relating to this study. Second, the project-level categorized data were summarized using data coding and categorization forms. Based on the fullness of interview information, the intent was to select four enterprise cases suitable for further content analysis from among the contents of the eight interviews. Finally, the four enterprise cases were subjected to individually coded and analysis. During these processes the research team performed content analysis and used other methods for reference(Fei et al., 2010)[15]; specifically, two members of the research team processed and read the case data, and then performed progressive coding, respectively.

The detailed coding and categorization process is as follows:

Step 1: Open coding

The research team created 113 entries based on the digital transformation strategy and extracted 120 primary codes from the entry database. Two coders generated codes respectively, and compared the codes, to determine agreed-on primary codes. If the two coders failed to reach consensus, the research team determined primary codes through discussion.

Step 2: Axial coding by constructs

From the 120 primary codes, the research team extracted 32 secondary codes, such as technical input level, and input and introduction modes. In the process of secondary coding, two members respectively determined the dimensions of codes in each construct database, and then compared them. If the codes were consistent, the coding results were confirmed. Otherwise, all members of the research team determined secondary codes through discussion.

Step 3: Selective coding by construct dimensions

According to the type of digital transformation strategy, the 32 secondary codes were categorized under 4 construct coding directories: orchestration strategies for technological resources, human resources, organizational structure, and ecological relationship. If the two members reached consensus on entries, the entries were incorporated into the construct coding database. Failing that, through discussion all members of the research team agreed to either incorporate or delete the entries into the construct coding database.

The process of coding is shown in Appendix C.

4. FINDINGS

4.1 Resource orchestration strategy for digitalization

Based on a coding analysis of qualitative data, the research team developed four resource orchestration strategies for digital transformation: technological resources, human resources, organizational structure, and ecological relationship.

4.1.1 Physical resource orchestration

The investment of technical resources is the first mentioned in the digital transformation of organizations, The technological input activities are significant in three aspects, namely, technological input level and input mode, and technological introduction mode.

1) Technological input level

According to the degree of penetration of technology in the organization, it can be divided into three technical levels from shallow to deep, namely, Interactive digital technology, process digital technology, basic digital technology. The interactive digital technology mainly refers to communication tools used on vendor-user interface. The process digital technology refers to the technology that involves organizational process change, represented by the MRP/ERP management information system, Internet search, and payment means. The Basic digital technology refers to the basic digital construction, represented by the data collection system and data analysis technology. For example, human resource data collection and analysis system of Suning and Uniqlo is used to evaluating human resource and top manager selecting. The interactive and process digital technology and was adopted in the four case enterprises, while the basic digital technology was only adopted in Suning and Uniqlo.

2) Technological input mode

This study finds that the interviewed enterprises invested in digital technologies in two ways, namely, self-development and outsourcing (purchasing or collaborating). For example, Vanguard purchased interactive tools Business Advisor from Alibaba and intelligent customer service from Meituan. In addition, its internal management systems (e.g., CRM and warehouse management) are purchased mature standardized products. While, Uniqlo has developed websites and back-end ERP systems for B2B and B2C and been committed to optimizing the interconnection of IT infrastructure and Internet marketing tools in the past decade by itself. At present, Uniqlo's internal modular information systems are well interconnected. For example, the new product image management (PIM)

system is not only connected to its ERP system and social media (e.g., WeChat Moments, YouTube, and Instagram), but is also interconnected with other retail platforms through QR codes. PIM has become a data center for Uniqlo. Likewise, Suning has chosen to self-develop its digital infrastructure from the underlying architecture to superficial interactive applications.

3)   Technological introduction mode

Regardless of whether self-development or purchase is chosen, all case enterprises take a prudent attitude toward new digital technologies. Universally, they choose to implement digital only after pilot application and optimization. Enterprises take a prudent attitude for different reasons. Some implement the trial-and-error method on a small scale simply to prevent financial waste. Other enterprises pay more attention to technological effectiveness issues such as the integration of technological tools and their core. Enterprises giving priority to the digital strategy usually look upon technologies and tools from the perspective of digital technology consistency and are committed to solving global and underlying problems (e.g., core integration, cloud deployment, system connection access). Enterprises looking upon the digital strategy as auxiliary mostly try out new digital technologies or tools for the sake of financial performance and customer experience.

4.1.2   Human resource orchestration

It is generally believed that digital technologies will replace some low- and middle-skilled jobs (Graetz and Michaels, 2015)[18]. This study found that in the process of digital transformation, enterprises implemented a far more subtle human resource reform strategy than job replacement. In the following section, this is described in three aspects, namely, labor resource structure, human resource scale, and management.

1)   Labor resource structure

In digitalization process, enterprises realize man-machine cooperative labor resource structure through labor substitution and machine enhancement. First, digital technologies replace certain mechanical jobs. In the retail industry, digital technologies are mainly replacing jobs such as customer service, cashier, and warehouse management. Job replacement is based on different principles. Customer service and warehouse management positions are being replaced by intelligent voice technology and intelligent warehouse technology respectively, while cashiers are mostly replaced through customer self-services. Second, digital technologies strengthen jobs. For example, intelligent customer services help customer service personnel of retail enterprises (e.g., Suning) answer repetitive and basic questions, and allow the saved manpower to address more emotional and complex problems. Man-machine reengineering for customer services improves customer experience and efficiency and quality of services. As another example, digital technologies share the formatted and batched design work of Uniqlo, thus allowing design personnel to focus on creative and aesthetic work. Such

man-machine combination enhances the design capability of enterprises. Evidently, digital transformation of the retail industry does not merely imply labor replacement, but essentially denotes an enhancement in human labor. Organizations should allow the resources saved by intelligent technologies to release new value of labor force and create man-machine integrated labor resources. Enterprises will only reap short-term benefits if they merely use digital technologies to replace human jobs, that is, they can only improve their performance sustainably after they genuinely achieve man-machine synergy.

2)   Human resource scale

Some jobs have disappeared while new jobs have been created. Therefore, the total scale of the labor force has not changed significantly within a visible range. Although many jobs have been replaced, new jobs have provided more employment opportunities. In addition, some employees are just transferred across different functional positions of the same type of jobs. Take customer services as an example. Pre-sales customer service personnel are downsized because of replacement by intelligent customer services; however, there is an increase in after-sales customer service personnel to improve service experience. Similarly, the number of loading, unloading, and handling personnel has been greatly reduced while the number of intelligent warehouse management and maintenance personnel has been increased.

3)   Human resource management

Human resource management needs to be changed in terms of training, assessment, recruitment and salary for man-machine collaborative labor force.

In terms of training: in order to improve the ability of organization members to use digital technology and cooperate with digital tools, enterprises have increased the training of employees' digital ability. For example, Suning retrained thousands of employees, focusing on training their ability of data collation and so on. On the other hand, as human beings undertake more emotional work, enterprises also drive their members to improve their communication and cooperation ability. For example, Uniqlo encourages employees to learn psychological knowledge such as consumer behavior, and Intime encourages marketers to improve their ability to cooperate with the data team. To train employees, some enterprises develop a framework for new skill training, while some purchase third-party training services.

In terms of performance assessment: first of all, digital technologies improve enterprise efficiency, thus raising the appraisal standards for sales volume and personnel. Second, the contents of personnel appraisal are also changed. For example, some enterprises appraise employees' performance in collaboration because digitalization emphasizes collaboration. Uniqlo redefines employee performance assessment to improve collaboration in omni-channel operations by incorporating the index of "all-round service". Third, the performance assessment of employees is more quantitative and

accurate. Technological patrols enable organizations to more quantitatively and accurately understand individual differences in employee performance, and choose to dismiss, retain, promote, or demote employees more objectively. For example, after Intime adopted digital technologies, the value of each assignment was calculated more accurately, employee behaviors were more transparent. As another example, since Suning applied AI-based speech analysis technology to appraise the traffic of customer service personnel in call centers, the technology can analyze in real time whether telephone operators meet the service standards. Call center managers can easily judge the service quality of customer service personnel based on evaluation report generate by AI-based speech analysis technology automatically.

In terms of recruitment: digital technologies improve the scientific nature of internal human resource management. First, enterprises strengthen internal human resources analysis and management either by purchasing human resources services or developing internal human resources analysis systems. For example, Suning has developed a credit rating system for employee teams to support digital selection of internal personnel, thus improving the efficiency of personnel selection. To select qualified personnel for key jobs, digital selection helps organizations generate a list of candidates quickly, prepare a differentiated appraisal report, and provide reports to top management for decision-making. Uniqlo has developed a human resources evaluation system for personnel recruitment, which is used to analyze the resumes of candidates. In addition, Uniqlo has also developed a test system and a virtual collaboration system, which are used to test the competences and personal characteristics of new employees. Second, an organizations' dynamic nature increases in the context of digitalization, thus, the recruitment of employees highlights characteristics such as learning ability and young mentality.

In terms of salary: first, the overall salary level of employees increases, while the overall efficiency of human resources is improved. When Suning implemented a digital transformation strategy in recent years, the sales volume per capita increased, annual labor cost decreased by at least 10%, whereas the salary per capita increased by approximately 20% every year. Second, there is a certain degree of differentiation in internal salaries of enterprises. The salaries of key digital jobs are generally increased, with the gap above the salaries of traditional jobs widening. Enterprises need to design transfer payment channels within the compensation system to maintain the stability of the human resources system.

4.1.3 Organizational structure orchestration

Digitalization requires enterprises to reconstruct their organization structure and internal relationship.

1) Organizational structure

In terms of adjusting post setting: First, as mentioned above, enterprises eliminate some mechanical operation positions, and increase some new positions involving

digital technology. For example, all the interviewed enterprises had increased their number of data analysts. Second, digital technologies create new jobs such as machine trainers. Third, digital technologies have changed the functions of certain positions. For example Uniqlo refocused the duties of the key account manager on "omni-channel integration."

In terms of reforming organizational structure: First, reinforcing the front–back-office structure. With the deepening of digital transformation, process automation increases, and the number of internal staff decreases, the customer-facing front-office department is strengthened, thus the organizational structure presents the characteristics of front-back-office structure. Second, strengthening the functions of the digital department. For example, Suning expanded the digital division by integrating the e-commerce related departments into the Internet operation center. Intime enhanced the role of digital departments in the organizational structure by renaming the original Business Intelligence Department as the Data Application Technology & Product Department, which directly reports to the president. Third, establishing new departments. For example, Suning established science lab as Innovation Center, to strengthen R&D in the fields of retail systems, data acquisition and analysis, image processing and recognition, and AI. The layout strategies of digital departments were not consistent among the interviewed enterprises. This is related to not only the digital strategic positioning of retail enterprises but also the types of products being sold. China Resources Vanguard (comprehensive supermarkets), has distributed its digital departments across diverse brands. For Uniqlo (a retail enterprise with focused product line), the digital department is more likely to become a core functional department. Fourth, flattening organization structure. On the one hand, under the omni-channel operation, the front-office layer of retail (especially the digital retail sector) is more powerful. On the other hand, "technological patrols" improves the span of management, so the organization shows a trend of flattening.

In terms of strengthening the leadership for transformation: First, digitalization calls for the support of top management to gain organization-wide support. Second, it is necessary to give priority to digital transformation in the overall corporate strategy as far as possible.

2) Organizational relationship

In terms of internal organizational relationship: First, organizational relationship changes from controlling relationship to cooperative relationship. For example, Uniqlo's B2C e-commerce platform requires collaboration between the downstream logistics and financial departments. Second, the vertical organizational relationship is weakened, whereas the horizontal organizational relationship is strengthened. For example, the budgets of Uniqlo's digital department are highly integrated through digital operations. The digital

department's budgets include not only its internal expenses, but also digitalized expenses of the sales and marketing departments, and even branch offices overseas. Third, the organizational relationship is gradually dominated by an extroverted rather than an introverted relationship. Retail enterprises become more customer-oriented, specifically, oriented toward customers' big and small data.

In terms of working relationships: Digitalization requires resetting job s content and business process. Resetting job content refers to analysis of job and recombining different contents, so as to achieve a reasonable division of labor between intelligent tools and human employees, give full play to the advantages of intelligent tools, such as efficient and accurate, 24-hour standby, etc., and give play to the unique abilities of human, such as "emotional protection" and intuition. For example, in customer service positions, mechanical service content and emotional content are carried out by intelligent machine and human respectively. Another example is intelligent tools that provide managers with data and situational information and help everyone make decisions based on data and analysis, rather than weakening people's voice in the decision-making process (Uniqlo). Resetting business processes, means leveraging the power of smart technology by transforming the whole business process in every way, rather than improving parts of the existing process with digital tools. In addition, the customer service process, procurement process, service innovation pattern also greatly change. In general, process resetting is an overall-change pointing to omni-channel integration, rather than to two separate channels of physical sales and online sales.

4.1.4   Ecological relationship orchestration
1)   Building an ecosphere

Digitization provides new opportunities to connect enterprises, employees, and consumers, making their boundaries fuzzy(Ritzer and Jurgenson, 2010)[38]. The retail industry is no longer a vertical line of business, but forms an ecosphere that transcends the scope of technologies and traditional organizational boundaries. Retail enterprises, suppliers, customers, external collaborators, and public sectors in the ecosphere are experiencing unprecedented connection and coordination with each other. Internally, enterprises' strategies, technologies, and operations are harmoniously combined; externally, enterprises maintain the sharing of benefit and controllability of collisions. Within and between retail enterprises, symphonic harmony is achieved, and value is co-created and shared. Compared with the traditional relationship, the relationship between retail enterprises and other participants has changed in the digital retail ecosphere.

Retailer and suppliers are linked more closely. In addition, suppliers' response speed is raised, and batches of product supply are reduced. Retailer cooperates with third party in a more open, transparent, and flexible manner. The relationship between retail enterprises and customers has also changed. Technologies have unprecedentedly increased the influence of customers in retail, and thus customer experience has been uncommonly emphasized. Retailer no longer merely focuses on improving the use value of products but pay more attention to the exchange value affected by the experience of use. This change in value logic has penetrated all aspects of retail, altering the cost structure of manufacturers. The traditional customer relationship has also transformed from a purchasing relationship to a value co-creation relationship. Although this phenomenon is not entirely new, it is further strengthened digitally. In addition, the customer relationship has transformed from a group to a particulate relationship. Retail enterprises pay attention not only to statistically significant group customer behaviors but also individual customer behaviors. Namely, retail enterprises can fully identify customer behaviors based on small data (comprehensive data) about individual customers, thus providing highly targeted services.

The relationship between retail enterprises and the public sector is more diversified. First, the digitalization of retail enterprises relies heavily upon government investment in digital infrastructure. Second, digitalization enables retail enterprises to acquire increasingly massive and comprehensive consumer data; hence, authorities' concern has placed more rigorous requirements on personal privacy protection. In addition, data acquired by retail enterprises provides particularly important basic support for digital social governance, for example income tax management and security of income groups. Third, the impact of digitization on job replacement and income polarization becomes a universal social problem. Retail enterprises will need to rely on governmental transfer payment to eliminate the negative impact.

2)   Type of external relationship

Depending on the strategic positioning of digitalization, retail enterprises show two types of external relationships: transactional and collaborative. Generally, retail enterprises are more inclined to choose external purchases if they lack overall digital strategies and are deficient in a digital foundation. By contrast, retail enterprises with systemized digital strategies and good digital infrastructure usually choose to open digital systems on a mutual basis with partners to facilitate synergy. For example, Suning has developed its own human resources evaluation system, and established science lab as innovation center. Intime has independently developed a new business process system, through which it exchanges its member data with Tmall's big data and, in turn, gains access to Tmall's various digital tools. Uniqlo has created its own human resources evaluation and management system. The partner relationship enhances the link of heterogeneous resources in the retail industry, promotes data sharing in the ecosphere, value co-creation, cost and benefit sharing, and creates connection bonus as new economic value to retail enterprises(Min and Liang-yu, 2015)[32]

3)   Strategic positioning of platform

Multilateral platforms are an obvious tendency in the digitization of the retail industry. Retail enterprises may choose to develop their platform or participate in existing platforms. Household appliance chain stores such as Suning were once offline platform enterprises. After the transformation to online operations, Suning has even strengthened its platform characteristics. Most retail enterprises solely participate in platforms created by other core enterprises. Of course, platform operation is not the only choice, Uniqlo didn't choose platformization development.

The above four resource choreography strategies are obtained through cross-case study, they elaborate the development of key resources and measures of resource bundling in the interviewed enterprises' process of digital transformation. Although key resources for digital transformation are all technological and human resources, resource bundling strategies (including technological input mode, human resource management, organizational structure and relationship, and external ecological relationship) are different among the interviewed enterprises. The intensity, depth and breadth of resource bundling strategies vary with the strategic positioning of digital transformation among retail enterprises.

4.2   Type Of Digitalization Strategy

Through cross-case analysis, it is found that the digitalization resource Orchestration strategy of the case enterprises have obvious differences in technological input level, technological input mode, organizational structure adjustment, type of external relationship, strategic positioning of platform and other aspects. The differences are caused by different digitalization strategy. Referring to the concept of digital strategic posture proposed by Mithas(Mithas et al., 2013)[33], two types of digitalization strategy--conservative type and offensive type can be identified from the extent to which retail enterprises choose to deviate from industry norms in digital input. A conservative digitalization strategy emphasizes maintaining the existing status and competitiveness; enterprise's digitalization should be subordinated to enterprise's business strategy; resource orchestration for digital transformation emphasizes control, balance, standardization, and directional data movement; enterprise's governance pattern is biased toward centralized management. An aggressive digitalization strategy, on the other hand, aims to increase the competitive advantage and expand the existing scale and scope of business through digitization; enterprise's digitalization strategy has a high strategic status and governs its business strategy; resource orchestration for digital transformation emphasizes flexibility, transparency, openness, creativity, and omni-directional data movement; enterprise's governance pattern is biased toward decentralized management. Table 2 lists the specific differences in connotations and resource orchestration between these two strategies.

Table 2 type and connotation of digitalization strategy

		conservative	aggressive
Resource orchestration	physical resource orchestration	buy digital tools ; Out sourcing digital infrastructure ;	self-develop digital infrastructure
	human resource orchestration	aim to replace manpower	aim to establish man-machine synergy labor
	organizational structure orchestration	no special person in charge of digitalization, senior leaders hold digitalization post currently ; existing IT department carries out digitalization ; optimization without changing existing processes	establish a chief data officer responsible for digitization ; IT department upgrate to DT department to carry out digitalization ; redesign the business process
	Ecological relationship orchestration	transactional relationship join platform	collaborative relationship; self-develop platform
strategy connotation	goal of strategy	avoid losing competitiveness and existing position in the digital revolution	improve competitive status and create new competitive advantage
	statue of strategy	subordinated to enterprise's business strategy	governs enterprise's business strategy
	feature of strategy	control,balance,standardization,data directional flow	flexible,transparent,open,creative,data flow all over the network
	governance pattern	centralization	decentralized

The choice between conservative and aggressive strategies is affected by enterprises' internal and external factors. To choose an appropriate digital strategy, retail enterprises must consider overall corporate strategies,

institutional environments, digital capabilities of main competitors, maturity of digital management practice, and corporate resources and capabilities. Generally, the enterprises who were interviewed usually chose a conservative strategy if the following conditions were met: 1) their corporate culture is biased toward an engineering culture; 2) they have a good foundation in digital management; 3) the competitive advantage is not obvious in the retail industry; and 4) the types of products sold by them vary slightly. By contrast, those enterprises interviewed who chose an aggressive strategy did so if the following conditions were met: 1) their Corporate culture is biased toward entrepreneurial culture; 2) their foundation in digital management is relatively weak; 3) their competitive advantage is obvious in the retail industry; and 4) there is a significant variation in sub-industries under which they fall or the types of products they sell. Of course, the choice between aggressive and conservative strategies is not an either-or choice but a degree of bias.

5. CONCLUSIONS

Based on the resource orchestration theory(Sirmon et al., 2011)[41],this study analyzes retail enterprises' resource orchestration strategy for digitalization, establishes digitalization strategy framework including three aspects, namely, resource configuration, resource bundling, and leveraging strategy. Regarding resource configuration, this study identifies three types of key resources (technological, human, and external ecological), and the

methods for acquiring them. Each type of resource must be acquired in an appropriate manner. Specifically, technical resources are developed independently or outsourced; human resources are acquired through enhancement, replacement, or job transfer; external ecological resources are acquired by developing platforms independently or participating in existing platforms. Resource bundling mainly involves the adjustment of human resource management, organizational structure (including the organizational relationship), and external relationships. It serves to build a coordinated internal/external organizational relationship and maintain the stability of resource structure for digitalization. Specifically, human resources are stabilized mainly through human resource management and organizational structure adjustment; technological resources are stabilized mainly through organizational structure adjustment (e.g., process adjustment) and external relationship coordination; and external ecological resources are stabilized mainly through the adjustment of external relationships. Ultimately, resource development and resource bundling are oriented toward a digital competition strategy. Specifically, their particular tactics vary, depending on whether the digital competition strategy is aggressive or conservative. The choice of a competition strategy is affected by diverse factors such as resource advantages, corporate culture, industry uncertainty, and competitive situation. Figure 5.1 shows the strategic implementation framework.
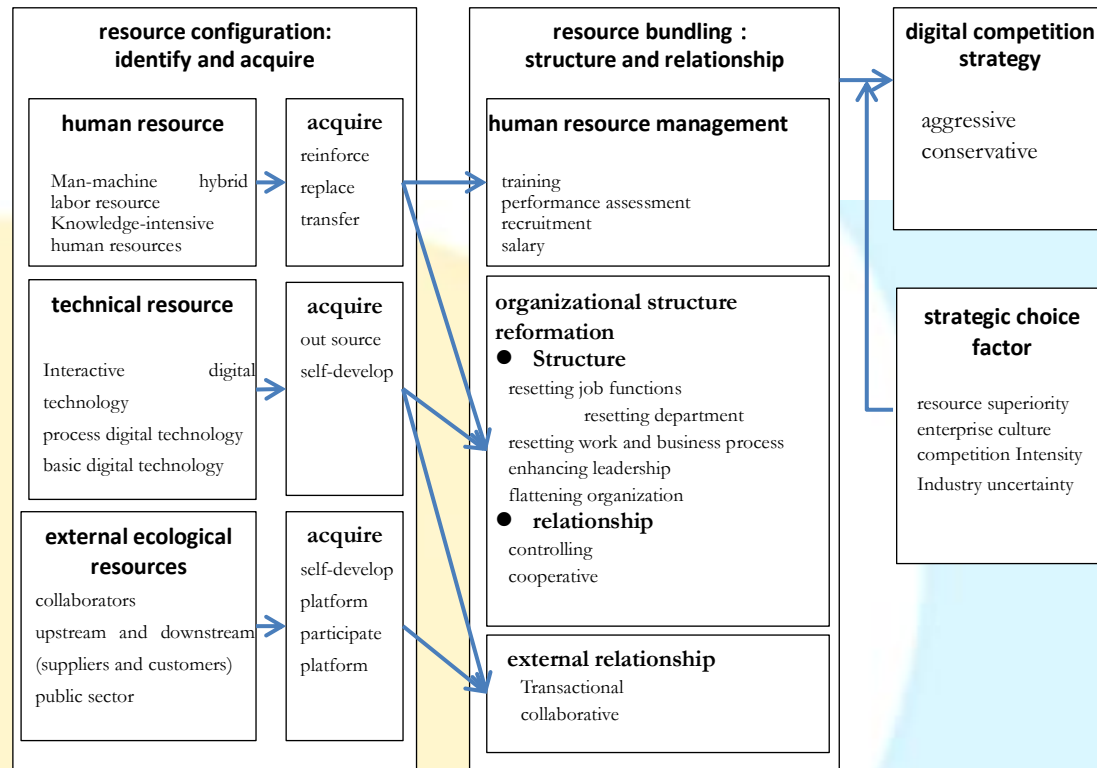
Fig.1. Framework of digitalization strategy

6. SUMMARY

The resource orchestration theory provides a basic analytical framework for uncovering the mechanism of interaction between resources and organizational strategies. This study analyzes the practices of resource orchestration under special scenarios of digital transformation among traditional retail enterprises. Through a cross-case analysis, this study determines the resource orchestration strategy of traditional retail enterprises in four dimensions (technological resources, human resources, organizational structure, and ecological relationship), and identifies two competition strategies for digital transformation (conservative and aggressive). In addition, this study proposes an overall framework of resource orchestration for digitalization among traditional retail enterprises.

Although this study focuses on traditional retail enterprises, its findings can provide a general reference for organizational transformation in the digital era. The digital transformation specific measures may vary significantly across different business patterns in the retail industry, other service enterprises, and manufacturing enterprises, but the basic logic of resource orchestration should be similar to all types of enterprise. Therefore, the overall framework of digitalization proposed in this study may be used by future studies for reference.

7. REFERENCES

[1] Baert, C., Meuleman, M., Debruyne, M., Wright, M., 2016. Portfolio entrepreneurship and resource orchestration. Strategic Entrepreneurship Journal 10 (4), 346-370.

[2] Barney, J., 1991. Firm resources and sustained competitive advantage. Journal of Management 17 (1), 99-120.

[3] Barney, J.B., 2001. Is the resource-based "view" a useful perspective for strategic management research? Yes. The Academy of Management Review 26 (1), 41-56.

[4] Barney, J.B., Ketchen, D.J., Wright, M., 2011. The future of resource-based theory:revitalization or decline? Journal of Management 37 (5), 1299-1315.

[5] Barua, A., Konana, P., Whinston, A.B., Fang, Y., 2004. An empirical investigation of net-enabled business value. MIS Quarterly 28 (4), 585-620.

[6] Bharadwaj, A., El Sawy, O.A., Pavlou, P.A., Venkatraman, N., 2013. Digital business strategy: toward a next generation of insights. MIS Quarterly 37 (2), 471-482.

[7] Bredmar, K., 2017. Digitalisation of enterprises brings new opportunities to traditional management control. Business Systems Research Journal 8 (2), 115-125.

[8] Brynjolfsson, E., Hu, Y.J., Rahman, M.S., 2013. Competing in the age of omnichannel retailing. MIT Sloan Management Review 54 (23-29).

[9] Chun-hua, C., Li, Z., Hao, Z., Chao, L., Meng-wei, W., Hao, Z., 2019. Practical innovation of Chinese enterprises from "digital survival"view. JOURNAL OF MANAGEMENT SCIENCES IN CHINA 22 (10), 1-8.

[10] Cianni, M., Steckler, S., 2017. Transforming organizations to a digital world. People & Strategy 40 (2), 14-19.

[11] Dacko, S.G., 2017. Enabling smart retail settings via mobile augmented reality shopping apps. Technological Forecasting and Social Change 124, 243-256.

[12] Davenport, T.H., Westerman, G., 2018. Why so many high-profile digital transformations fail. Harvard Business Review (3).

[13] Eisenhardt, K.M., 1989. Building theories from case study research. Academy of Management Review 14 (4), 532-550.

[14] Farrington, T., Alizadeh, A., 2017. On the impact of digitalization on r&d. Research-Technology Management 60 (5), 24-30.

[15] Fei, L., Hao, C., Hongxing, C., Baolong, M., 2010. How should china's department stores carry out the innovation in service?--a case study based on modern plazas in beijing. Management World (2), 114-126+187-188.

[16] Gebauer, H., Edvardsson, B., Gustafsson, A., Witell, L., 2010. Match or mismatch: strategy-structure configurations in the service business of manufacturing companies. Journal of Service Research 13 (2), 198-215.

[17] Glaser, B.G., Strauss, A.L., Anonymous, 1999. The discovery of grounded theory: strategies for qualitative research. Aldine de Gruyter, Hawthorne, NY.

[18] Graetz, Georg; Michaels, Guy (2015) : Robots at Work, IZA Discussion Papers, No. 8938, Institute for the Study of Labor (IZA), Bonn

[19] Grewal, D., Roggeveen, A., Runyan, R.C., 2013. Retailing in a connected world. Journal of Marketing Management 29 (3-4), 263-270.

[20] Grewal, D., Roggeveen, A.L., Nordfält, J., 2017. The future of retailing. Journal of Retailing 93 (1), 1-6.

[21] Hansen, R., Sia, S.K., 2015. Hummel's digital transformation toward omnichannel retailing: key lessons learned. Mis Quarterly Executive 14 (2), 51-66.

[22] Hao, J., Ya, L., Xiangying, X., business model transformation based on digital enablement: a case study on manufactureing enterprise. science & technology progress and policy 34 (3), 93-97.

[23] Helfat, C.E., Peteraf, M.A., 2003. The dynamic resource-based view: capability lifecycles. Strategic Management Journal 24 (10), 997-1010.

[24] Henriette, E., Mondher, F., Boughzala, I., 2015. The shape of digital transformation: a systematic literature review, Ninth Mediterranean Conference on Information Systems (MCIS), Samos, Greece.

[25] Hultman, J., Johansson, U., Wispeler, A., Wolf, L., 2017. Exploring store format development and its influence on store image and store clientele – the case of ikea's development of an inner-city store format. The International Review of Retail, Distribution and Consumer Research 27 (3), 227-240.

[26] Ilsoe, A., 2017. The digitalisation of service work - social partner responses in Denmark, Sweden and Germany. Transfer-European Review of Labour and Research 23 (3), 333-348.

[27] Jian, C., Shuo, H., Yunhui, L., 2020. Operations management in the digitization era : from empowering to enabling. Management World (2), 117-129.

[28] Johan, H., Malin, S., Niklas, E.-Z., 2016. The digitalization of retailing: an exploratory framework. International Journal of Retail & Distribution Management 44 (7), 694-712.

[29] Kane, G.C., Palmer, D., Phillips, A.N., Kiron, D., Buckley, N., 2018. Coming of age digitally. MIT SMR and Deloitte

[30] Madlenak, A., Radosinska, J., 2015. Aidc in the digital world or how to identify data via gtin codes in retails and small enterprises, in: Matus, J., Petranova, D. (Eds.), Marketing Identity: Digital Life, Pt II, pp. 139-147.

[31] Mikko, H., Anssi, S., Lasse, M., 2018. Digitalization in retailing: multi-sided platforms as drivers of industry transformation. Baltic Journal of Management 13 (2), 152-168.

[32] Min, L., Liang-yu, L., 2015. The innovation of business modle ininternet era: from value creation perspective. China Industrial Economics (1), 95-107.

[33] Mithas, S., Tafti, A., Mitchell, W., 2013. How a firm's competitive environment and digital strategic posture influence digital business strategy. MIS Quarterly 37 (2), 511-536.

[34] Nadeem, A., Abedin, B., Cerpa, N., Chew, E., 2018. Editorial: digital transformation & digital business strategy in electronic commerce - the role of organizational capabilities. Journal of Theoretical and Applied Electronic Commerce Research 13 (2), I-VIII.

[35] Pagani, M., 2013. Digital business strategy and value creation: framing the dynamic cycle of control points. MIS Quarterly 37 (2), 617-632.

[36] Pantano, E., Priporas, C.-V., 2016. The effect of mobile retailing on consumers' purchasing experiences: A dynamic perspective. Computers in Human Behavior 61, 548-555.

[37] Pantano, E., Viassone, M., 2015. Engaging consumers on new integrated multichannel retail settings: challenges for retailers. Journal of Retailing and Consumer Services 25, 106-114.

[38] Ritzer, G., Jurgenson, N., 2010. Production, consumption, prosumption:the nature of capitalism in the age of the digital 'prosumer'. Journal of Consumer Culture 10 (1), 13-36.

[39] Rui, W., Ming, D., Hao, H.W., 2019. Research on evaluation model and method of digital maturity of manufacturing enterprises. Science and technology management research 39 (19), 57-64.

[40] Sanchez, M.A., Zuntini, J.I., 2018. Organizational readiness for the digital transformation: a case study research. Revista Gestao & Tecnologia-Journal of Management and Technology 18 (2), 70-99.

[41] Sirmon, D.G., Hitt, M.A., Ireland, R.D., Gilbert, B.A., 2011. Resource orchestration to create competitive advantage: breadth, depth, and life cycle effects. Journal of Management 37 (5), 1390-1412.

[42] Svahn, F., Mathiassen, L., Lindgren, R., 2017. Embracing digital innovation in incumbent firms: how volvo cars managed competing concerns. MIS Quarterly 41 (1), 239-254.

[43] Valenduc, G., Vendramin, P., 2017. Digitalisation, between disruption and evolution. Transfer-European Review of Labour and Research 23 (2), 121-134.

[44] Vandermerwe, S., Rada, J., 1988. Servitization of business: adding value by adding services. European Management Journal 6 (4), 314-324.

[45] Verhoef, P.C., Kannan, P.K., Inman, J.J., 2015. From multi-channel retailing to omni-channel retailing: introduction to the special issue on multi-channel retailing. Journal of Retailing 91, 174-181.

[46] Yan, Q., Jing, S.Y., Hong, W.L., 2017. Research on retail business model innovation under the background of digital technology revolution. Management World (12), 182-183.